



# OUR HERITAGE

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## **INTERNATIONAL MULTI-DISCIPLINARY CONFERENCE**

### **Theme**

**Health Care Management: Today and Tomorrow**

**ORGANIZED BY**

**VIDYALANKAR SCHOOL OF INFORMATION TECHNOLOGY  
MUMBAI**

**7<sup>th</sup> & 8<sup>th</sup> FEBRUARY, 2020**



**VIDYALANKAR SCHOOL OF INFORMATION TECHNOLOGY  
MUMBAI**

## **Guest Editor of Special Issue**

**Dr. Rohini Kelkar**

**Principal**

**Vidyalankar School of Information Technology, Mumbai**

## **ABOUT VSIT**

Vidyalankar School of Information Technology (VSIT) is a part of Vidyalankar Dnyanpeeth Trust situated in Mumbai and is affiliated to the University of Mumbai. It was established in the year 2002. VSIT offers both graduate and post-graduate programmes in the subjects of Information Technology, Commerce and Management. It is a NAAC accredited college that aims to impart Quality Education in the field of Science, Commerce and Management. VSIT has tie-ups with renowned Foreign Universities like Penn State University, Rutgers University, California State University, University of Toledo, University of South Carolina and many more. The mission of the institute concerns the creation of an educational environment where students can reach their full potential in their chosen discipline and also a scholarly environment where the talents of both the faculty members and students are nurtured and used to create knowledge and technology for the benefit of the society. Fostered in the values expounded by the erudite founders C. S. Deshpande and Dr. Sanjeevani Deshpande and currently propelled under the able leadership of the zealous Vishwas Deshpande, VSIT is driven to set the highest standards in teaching and research.

## **ABOUT VCMT**

Academia is a fertile ground for germination of new ideas and innovation. Teaching is no longer the sole functional role of educators. Considerable academic efforts involve research and learning to enable educators to become facilitators and contributors to knowledge. Every academic circle aims to expand its creative and contributory capacity. VSIT conducts an annual national research conference named VCMT, formerly known as VISMIT. The conference aims to inculcate the inclination towards and augment an educator's knowledge of their respective fields of expertise through research. It works to congregate ideas and to enable an understanding of new perspectives and paradigms not only for the teaching faculties of the institute but also for those from other institutes and the industry. VSIT has been building its VCMT conference since last 5 years it's one of the fertile grounds for germination of new ideas and innovation keeping this in mind this year VCMT 2020 has been focused on the theme " Health Care Management: Today and Tomorrow".

The conference aims to examine and evaluate the predominant trends in the existing system of management in the health care sector and glean its future prospects in matters of research, policies, aesthetics, nutrition, insurance, environment, government schemes, technological advancements and medical humanities. Medicine and medical management as a field of enquiry is quite intriguing today as it is no longer limited to medical services provided but also encompasses a wide range of patient-oriented services and is closely linked to the productivity of the human resource and its role in nation—building. The conference will serve to facilitate an exchange of ideas and research among research scholars, academicians and industry experts.

## **ABOUT IARA**

Indian Academicians and Researchers Association ( IARA ) is an educational and scientific research organization of Academicians, Research Scholars and practitioners responsible for sharing information about research activities, projects, conferences to its members. IARA offers an excellent opportunity for networking with other members and exchange knowledge. It also takes immense pride in its services offerings to undergraduate and graduate students. Students are provided opportunities to develop and clarify their research interests and skills as part of their preparation to become faculty members and researcher. Visit our website [www.iaraedu.com](http://www.iaraedu.com) for more details.

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Dr. Renuka Herath  
Dr. Aarti Milind Karande  
Ms. Vinita Pimpale  
Mr. Vishram Bapat  
Dr. Rajendra Patil

# MESSAGES



## ***Message from Principal***

Vidyalankar School of Information Technology (VSIT), a Commerce, IT and Management college affiliated to University of Mumbai, has always been organizing activities pertaining to the current topics of interest to the academicians, industrialists, students and other stakeholders of the education system. The theme of V-CMT 2020 - an international multi-disciplinary Conference – “Health Care Management: Today and Tomorrow” follows the same spirit.

There are numerous parts of the economy that are ailing. Nonetheless, the healthcare industry has continued to develop, even as different enterprises have endeavored to discover their ground and balance out their capital. There is a requirement for extensive medical services as a result of an expanding populace just as the advances in science have assisted with expanding the life expectancy of individuals in most developing nations. There is thus a need to consistently improve the practices engaged with healthcare and the executives to fulfill an ever-expanding market. There is a need to systemically build an arrangement of administration and leadership that can apply present-day leadership strategies to successfully deliver maximum benefits to the population. There is additionally a corresponding increase in the effectiveness of modern technologies that have aided healthcare advances today. Careers in healthcare management also continue to boom. Communicators, premium managers, ethical and disciplined leadership and excellent legal consults are all sought after in the sector.

**Dr. Rohini Kelkar**  
Principal  
Vidyalankar School of Information Technology  
Mumbai



## ***Message from Steering Committee Member***

The Management of Healthcare is an important socio-economic issue, and it has acquired newer dimensions in recent years, mainly due to the ever-changing technological applications which the sector encounters. Given the contemporary relevance of the Healthcare Sector in nation-building and in the socio-economic transformation currently under way in India, VCMT 2020 focuses on three principal aspects – Healthcare Industry – Current Status; Healthcare Policy, and Application of Technologies to the Healthcare Sector.

The objectives of the Conference include an assessment of the status and prospects of the Healthcare Industry; an evaluation of the various policy initiatives undertaken by the Government in the Healthcare Sector and understanding the implications of the emerging technologies applied to the healthcare sector.

The invited Expert Speakers and the Panelists will share their views and insights on specific themes related to HEALTHCARE SECTOR. The Conference will have Presentations from senior Doctors, Medical Practitioners as well as Industry-stalwarts and academicians. As always, this conference also aims to encourage Teachers and Students to contribute research paper on these themes. VCMT-2020 has received an overwhelming response. Several papers were received from faculties as well as students. This volume puts together the selected papers which have been reviewed and edited by the committee. We sincerely hope that the contents of this volume proceeding will be of use and value to the teachers as well as students of Commerce, Management and Information Technology.

**Dr. Chandras Deshpande**  
Adjunct Faculty  
Commerce and Management  
Vidyalankar School of Information Technology, Mumbai



## ***Message from Steering Committee Member***

In context of the growth aspirations for Indian economy, we have chosen to focus on specific domains for our conference this year. Healthcare was the obvious choice, being one of the most active and also one of the fastest growing sectors.

It is a sector where the challenges are plenty – ranging from diversity of services to geographical reach, from day to day support to specialized services, from human knowledge and skill demands to infusion of technology, high risk tasks like complex operations to managing risks for a better life.

Specifically, the technological advancements are impacting all walks of our lives. And Healthcare sector is no exception. Elaborate solutions in wide range of technologies like robotics, imaging, artificial intelligence, pattern recognition, are changing the way we deal with healthcare. They have transformed the way healthcare services are delivered to the society, improved the reach as well as service levels, provided additional safety measures to high risk elements and much more. V-CMT 2020 aims to explore this path further seeking solutions to newer challenges, making the future safer and healthier for the following generations.

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Adjunct Faculty  
Information Technology  
Vidyalankar School of Information Technology, Mumbai

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## Revenue Generation Model of NGOs in Healthcare Industry - Sankara Netralaya

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### ABSTRACT

*The not for profit organisations have a different approach for business. The normal business model may not suit their sustainability and revenue generation. Support from Sponsors, effective employment commitment, avoiding conflict of interest, availability of volunteers with business acumen and expertise in the field, adoption of effective strategy are some of the crucial factors which determine the success of a not for profit organisation.*

*This case is about the strategies adopted by Sankara Netralaya with a focus on its CSR activities. Being a healthcare company, it follows a very unique business model which had made them to create an edge in the eye care sector. Inspired by the CSR activities of Aravindh eye hospital, Sankara Netralaya provides free eye care services to about 40% of its patients. The organisation is able to do it through its collaborative programmes with the other corporate companies as well as educational institutions thus paving the way for these organisations that collaborate with Sankara Netralaya to carry out their CSR. This study aims to look into this business model of the organisation. The study concludes by looking at how Sankara Netralaya has managed to efficiently deliver services to the weaker sections of the society and at the same time, not compromising on its quality and making the best use of its latest technologies. It has carved a unique model for CSR avenues for other companies too.*

### INTRODUCTION

According to the Directorate General of Health Services, the projected rate of blindness according to the survey of 2015-2018 is 0.45% which is on a decreasing trend compared to the earlier 1.1% from the year 2006-2007(1). But still, the 0.45% taking into account the country's population is still large a number. India constitutes to one by third of the world's visual impairment with 12 million Indian citizens suffering from some kind visual ailment. The people who would be able to afford the eye care services. India's out of pocket medical cost accounts for 62% of the entire expenditure. This means that an average Indian citizen has to spend 62% of his medical expenses out of his pocket and the rest 28% is taken care of by the either the Government or other agencies. That contribution of 62% cannot be afforded by everyone (2). India's 22% of the population lives in the below poverty line (3). This entails that not all the Indian citizens can afford to spend for their ailments especially their visual ailments. This gap still largely remains untouched. The vicious gap of high medical expenses and poverty is taken up by various Government and Non Government organisations. Sankar Netralaya is one such organisation which renders yeomen service in the eye care sector.

Sankara Netralaya which means the "Temple of the eye" was established in 1978 under the wishes of Shri Jayendra Saraswathi a religious leader in Kanchipuram. The founder is Dr.Sengamedu Srinivasa Badrinath, a renowned ophthalmologist in the USA who returned to his mother land for providing services to the people living here. It was started as an NGO with a purpose of providing missionary services. The organisation has 13 branches spread across the states of TamilNadu, Andhra Pradesh and West Bengal.

### METHODOLOGY

The case Study method is used where an in-depth study of a specific subject must be carried out. Rather than overviews, case study aims at specific issues. A case study is neither a press release nor a advertisement .The case being taken here is the challenge of generating revenue in the case of a non profit organisation. The study is confined to Sankara nethralaya and the period of study was 45 days.The study had made use of both primary and secondary data. Secondary data was from the company websites, news bulletins, other research articles. For primary data, the concerned officials of the company were contacted through mail and information were obtained.

### DATA COLLECTION

Case study approach depends on various secondary sources of data and primary source, as and when needed. In this case, The strategies of Sankara Nethralaya had been explored. The

majority of the data is obtained from the organisation's website and annual reports. Thus, making this a study based on secondary data. And also mail correspondence was done with the authorities in the hospital. They are Mr.S. Alagiri department of fund raising, MS.B. Kavitha consultant and Mr. T. Parthasarathy head of CSR department.

## **VISION AND MISSION STATEMENTS OF SANKARA NETRALAYA**

### **Vision**

Be the center of excellence in delivering total eye care for all and spreading knowledge through Education and Training and carrying India centric Research for alleviating visual morbidity.

### **Mission**

The mission of Sankara Nethralaya is to provide Total Eye-care solutions of highest standards to all sections of community through a team of competent, committed and compassionate professionals in a patient-friendly environment.

The vision statement of the organisation is delivering total eye care for all which highlights the organisation's belief of providing eye care services for everyone equally. The mission statement of the organisation talks about the excellence that has to be maintained in the services that it provides. The main branch of the hospital is located in Chennai. Sankara Netralaya inspired by the business model of Aravind eye hospital has quite a different business model. It provides free eye care for the 40% of its patients and the organisation does not do it alone. It takes the helping hand of the other corporate companies in order to meet the resource requirements. This gives the Corporates a chance to meet their mandatory CSR requirements. This study will look into the business model of Sankara Netralya in detail.(4)

### **Services provided by Sankara Netralya**

Sankara Netralaya true to its name acts as a big service provider for the people in the poverty line who are not able to afford the eye care medications. Sankara Netralaya provides eye care related services to 40% of its patients. Also, the organisation ensures that the quality of the service provided is maintained regardless of the person paying or not. The wait time, medications and the patient care show no difference between the paying patients and the non-paying patients. The organisation also conducts eye camps in the rural areas of West Bengal and Tamil Nadu to provide eye care facilities to the people who may not be able to have an access to the eye care related services. Sankara Netralya also provides Teleophthalmology services. Teleophthalmology refers to the eye care services provided digitally generally to the rural areas from the urban areas. All of this are offered free to the people who cannot afford standard eye care facilities. Keeping up with the technology the organisation also collaborates with educational institutes like IIT, thus engaging in a constant research as to how to provide more at a lesser cost. The answer to this was the MESU Mobile Eye Surgical Unit (MESU), a medico-engineering marvel, an operation theatre on wheels. This is the first of its kind in Asia, providing eye surgeries on the go. On an average 1200 patients arrive into the institute and 200 surgeries are performed all in a day.

For its services, Sankara Netralya has received countless awards and recognitions notably the award from the state of Tamil Nadu from the hands of the Governor Baniwarlal Purohit. Thus, even though Sankara Netralya was inspired by Aravind eye hospital in its business model, it has strived its way to cultivate a recognition of its own by the excellence in the quality and the service that it provides. Sankara Netralya is the first eye care hospital in Asia ISO 9002. The organisation also introduced Total Quality Management (TQM) policies audited by BVQI which is a global leader in conformity assessment and certification services. The main hospital, the Jagadguru Kanchi Sri Chandrasekarendra Saraswathi Nethra Nilayam (JKCN Complex) and the CU Shah Sankara Nethralaya have the a NABH accreditation, the highest recognition in the health care sector.

### **Challenge at hand in the case**

Primarily being an NGO, Sankara Netralaya heavily relied on the donations from other companies for their community projects, expansion of facilities and other small endeavours, similar in nature. The mandatory CSR clause of the New companies law 2013 was leveraged well by this company for its fund generation. Companies who have reported a net profit of 5 INR Crores and the companies whose market capitalisation is more than 500 crores has allocate 2% of their profits as CSR. So as expected companies who had not looked into CSR

much in the past were now searching for new avenues to carry out this mandatory spending. Sankara Netralaya made use of this opportunity. The organisation established tie up with the corporates. For this purpose, Sankara Netralaya has a separate department of CSR whose function is to establish contacts with the corporates that are willing to carry out their CSR with Sankara Netralaya.

So one should understand Sankara Nethralaya as such is not involved in CSR activity as it is an NGO and it does not fall under the mandatory CSR Clause. Nevertheless, it has developed a business model that aids in CSR of other companies and revenue generation for itself.

## Business model

The business model of Sankara Netralaya is extremely interesting. Sankara Netralaya for all the services that it provides is still able to provide them without a hitch and has seem to have handled the problems of the scarcity of the resources at the course of its endeavour quite efficiently. Sankara Netralaya as said earlier provides free patient care for 40% of its patients. The rest 60% of the patients have to pay a nominal charge. So that means that not much financial resources can be expected from the fees paid by the rest 60% of the population. To know how this is possible a look should be taken into the business model of the organisation.

## Strategic piggy backing

Strategic piggy backing is a type of social entrepreneurship, where an NGO receives funding from a corporate in the form of money or material. There is no other benefit that can be derived from the material or funding so provided except for providing services. As we see the core purpose of strategic piggy backing is to reduce the gap between expenses and revenue. The primary purpose is to get enough subsidies to provide services. This kind of strategic piggy backing is popular in the sectors of educational institutions, hospitals and so on. We see that Sankara Netralaya to reduce its gap between expenses and revenue, has adopted this strategy. We can say for sure that the revenue of Sankara Netralaya that is the fees it receives from the paying patients will not be enough to meet the expenses it incurs for the service that it provides. So, the strategic piggy backing is a fool proof method for it to reduce this gap. We see that there are 4 approaches to the strategic piggy backing they are. Before undertaking a strategic piggy backing an organisation should have the following resources:

- Something to sell
- Management talent
- Trustee support
- Entrepreneurial attitude.

We see that something to sell here is the opportunity for the companies to do CSR. Trustee support is the support provided by the corporations to Sankara Netralaya and the entrepreneurial attitude is all about achieving excellence in the business model thus established. Hence, we see that Sankara Netralaya has the resources as well as the clear conceptual understanding of the strategic piggy backing.

The corporates provided material resources as well as equipment resources to Sankara Netralaya thus making sure that the organisation was not faced with shortages and the corporates on the other hand were able to give accountability for the mandatory CSR spending. Thus, both Sankara Netralaya as well as the corporates is able to benefit from this i.e. strategic piggy backing. With the help of this strategy, the organisation has tied up with companies like BHEL, HPCL, FDC, TVS, HDFC, Bajaj, IOC, ONGC and many other corporates and is able to provide services to many people stuck in poverty and rural areas who do not have access to health facilities to get free eye care services.

**Table I - CSR Supporters of Sankara Nethralaya from 2017 to 2014**

S.No.	Year	CSR Supporters	Nature of Projects
1.	2016-17	1. L&T Technology Services Pvt. Ltd., Chennai. 2. HPCL LPG bottling plant, Gummudipoondi, Chennai. 3. Panasonic carbon India, Tada, A.P. 4. Canara Bank	Community Projects
2.	2015-16	1. L&T Technology Services Pvt. Ltd., Chennai 2. L&T Limited, Mumbai	Community Projects

		<p>3. BorgWarner Morse Systems India Pvt. Ltd., Chennai 4. Ibis Hotels, Chennai 5. Synergy Maritime Pvt. Ltd., Chennai 6. St. Gobain Glass India Ltd., Chennai 7. J G Hosiery Private Limited, Kolkata 8. Amrutanjan Health Care Limited, Chennai 9. Infogain India Private Limited, Mumbai 10. Computer Age Management Services, Chennai 11. Sundaram BNP Paribas Home Finance Limited, Chennai 12. Tata Consultancy Services, Mumbai 13. The Clearing Corporation of India Ltd., Mumbai 14. Royal Sundaram General Insurance Co., Ltd., Chennai 15. The Peerless General Finance &amp; Investment Company Limited, Kolkata 16. Glaxo Smith Kline Pharmaceuticals Ltd., Mumbai (Education)</p>	
3	2014-15	<p>1. GSK pharmaceuticals, Mumbai  2. Mahindra World City, Chennai  3. Kuehne+Nagel Pvt. Ltd, Chennai 4. Sri Sai Trust</p>	<p>Rs.33 lakhs for education support in TSNA for 15 diploma students(for 2014-15&amp;2015-16) and 15 degree students (for 2014-15, 2015-16 and 2016-17) of indigent background. 7.5 lakhs (for MESU-6.45 lakhs &amp; ESO school screening - 1.05 lakhs.)</p> <p>Rs. 6.6 lakhs (for MESU) will support the cataract surgeries for 240 patients for one year commencing from April 2015 – March 2016. at Rs 2500</p>
4.	2013-14	State Bank of India (Local head office) Chennai	Rs. 190 Lakhs for expansion projects

Secondary data compiled from Annual reports from 2017 to 2014

## NOTES FORMING PART OF ACCOUNTS

\*Donation and Grants received towards Capital Purchases are accounted under Capital Fund.

\*Donations received for Community Services accounted under Income Statement.

We see that the model followed by Sankara Netranya is not only efficient but also literally lifesaving. Donations to the organisation can be made through online donations portal available in the organisation's website or by contacting the CSR department of the organisation. (5)

## CONCLUSION

Hence, we see that Sankara Netranya does indeed function as the 'temple of the eye' by ensuring both quality and quantity in its delivery. This is made possible only because of the effective strategy and the unmatchable business model of the organisation. This efficient business model makes sure that both the organisation as well as the people that are helping the organisation function is able to get benefitted and at the end benefit the society as well. Organisations and corporates should take up this model and work towards making the world a

better place to live in. Sankara Netralya is one of the hospitals to prove that marketing strategies need not be successful in the product-based industry alone if implemented properly a marketing strategy can help form a business model and make the lives of the people easier. Sankara Netralaya continues to be a living proof of the marketing strategy used in the right way.

## QUESTIONS

1. Do you find the vision and mission statements of the organisation aligned with its operations? Justify
2. How is the strategic piggybacking of Sanakara Nethralaya different from other NGOs?
3. What are the other non profit strategies you could suggest for the organisation?

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## An Analytical Study of Benefits of Maintaining Healthy Work-Life Balance at Work Place

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### ABSTRACT

*The Researcher Has Studied The Views Of People In Respect Of Benefits Of Maintaining A Healthy Work-Life Balance At Work Place. The Study Was Conducted In Mumbai Region. The Data Was Collected From The Respondents With The Help Of Structured Questionnaire And Analyzed Using Simple Percentage Method, Mean, Median, Mode And One Sample T Test. Responses From 43 Respondents Show That There Are Various Benefits Of Maintaining A Healthy Work-Life Balance At Work Place.*

*Keywords: Commitment, Healthy Work- Life Balance, Importance And Mental Health*

### I. INTRODUCTION

Work-life balance does not mean an equal balance. It is the state of equilibrium in which demands of personal life, professional life, and family life are equal. Proper work life balance promote employees to share their time on the basis on priorities and maintain a balance by devoting time to family, health, vacations etc along with making a personal career and satisfying personal interest. In the competitive and era of technology, there is lot of pressure on employee to complete task in stipulated time. Sometimes also they have to work from home which disturbs their personal and family life. There are various causes of work life imbalances. Hence, it is extremely important to maintain proper work life balance.

### II. SIGNIFICANCE OF THE STUDY

The study will help to understand the benefits of maintaining a healthy work-life balance at work place.

### III. OBJECTIVES OF THE RESEARCH PAPER

The objective of the present study is as follows:

1. To study the benefits of maintaining a healthy work-life balance at work place.

### IV. HYPOTHESIS OF THE RESEARCH PAPER

The hypothesis of the present study is as follows:

H0: There are not significant benefits of maintaining a healthy work-life balance at work place.

H1: There are significant benefits of maintaining a healthy work-life balance at work place.

### V. RESEARCH METHODOLOGY

The study is conducted to obtain data on benefits of maintaining a healthy work-life balance at work place. In the present study, the research has used both methods primary and secondary method of data collection. The study is conducted in Mumbai region.

#### PRIMARY METHOD OF DATA COLLECTION

In primary method, researcher has collected data from 43 respondents. A sample size of 43 was selected using the convenience sampling method. The samples are included only literate population. Survey method is used for collection of data from the sample. The structured questionnaire was designed for the same to collect data (responses) from the sample. However, the discussion, observation and personal interviews have been conducted to collect responses from the sample of the study.

#### SECONDARY METHOD OF DATA COLLECTION

The secondary data are those which have already been collected and passed through statistical process. The secondary data for the study were based on Annual reports, Newspapers, Journals, Published, Dissertation, Research Papers etc. The articles in magazines, Internet, Video has also been considered for the purpose of secondary data collection.

## VI. LIMITATIONS OF THE STUDY

The study was confined only in Mumbai region and limited to only 43 respondents.

## VII. DATA ANALYSIS AND INTERPRETATION

Data were collected from 43 respondents from Mumbai region. The data collected from the 43 respondents were analyzed using simple percentage method, Mean, Median, Mode and One Sample T-Test.

### SAMPLE PROFILE

In the present study, samples were selected using simple random sampling.

**Table No. 1.1: Gender**

Gender	Frequency	Percent
Male	23	53.50
Female	20	46.50
<b>Total</b>	<b>43</b>	<b>100.00</b>

Table No. 1.1 reveals the number of respondents with respect to gender. For the present study, 23 Males and 20 Females were deliberately and randomly selected for the response to questionnaire.

Sources: Compiled from Primary Data

**Table No. 1.2: Age (Years)**

Age	Frequency	Percent
21-30	08	18.60
31-40	22	51.20
41-50	09	20.90
51-60	04	09.30
61 and above	-	-
<b>Total</b>	<b>43</b>	<b>100.0</b>

Table No. 1.2 reveals about age wise distribution of respondents. Out of 43 respondents, 8 respondents between 21 - 30 years, 22 respondents were between 31 - 40 years, 9 respondents were between 41-50 years, 4 respondents were between 51-60 years. There were none respondents between 61 years and above.

Sources: Primary Data

**Table No. 1.3: Marital Status**

Marital Status	Frequency	Percent
Married	39	90.70
Unmarried	04	9.30
<b>Total</b>	<b>43</b>	<b>100.0</b>

Table No. 1.3 reveals marital status of the respondents. Out 43 respondents, 39 respondents were married whereas only 4 respondents were unmarried.

Sources: Compiled from Primary Data

**Table No. 1.4: Qualification**

Qualification	Frequency	Percent
Ph.D.	11	25.60
Post Graduate	25	58.10
Professional	07	16.30
<b>TOTAL</b>	<b>43</b>	<b>100.00</b>

Table No. 1.4 reveals educational level of respondents. 11 respondents were Ph.D. holders, 25 respondents were Post Graduate, and 7 respondents were Professional.

Sources: Compiled from Primary Data

**Table No. 1.5: Occupation**

Occupation	Frequency	Percent
Profession	02	04.70
Salaried	39	90.70
Self-employed (Business)	02	04.7
<b>Total</b>	<b>43</b>	<b>100</b>

Table No. 1.5 reveals occupation wise distribution of the respondents. Out of 43 respondents, 39 respondents were salaried, 2 respondents were (Self-employed) Business, and 2 respondents were professional.

Sources: Compiled from Primary Data

**Table No. 1.6: Monthly Income (₹)**

Income in ₹	Frequency	Percent
Up to 15,000	1	2.30
15,0001 - 25000	3	7.00
25,001 – 50,000	9	20.90
50,001 - 75,000	18	41.90
75,001 - above	12	27.90
<b>Total</b>	<b>43</b>	<b>100.0</b>

Above table no. 1.6 reveals monthly income of respondents per month (in ₹). 1 respondent was earning up-to Rs. 15,000, 3 respondents were earning between ₹ 15,001 to ₹ 25,000, 9 respondents were earning between ₹ 25,001 to ₹ 50,000, 18 respondents were earning between 50,001 - 75,000 and 12 respondents were earning between ₹ 75,001 and above.

Sources: Compiled from Primary Data

## ANALYSIS OF DATA OF THE PRESENT STUDY

To study the benefits of maintaining of healthy work life balance at work place, the respondents were asked to express their views on the five point benefits scale. The codes for which are given below.

SA = Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, SD = Strongly Disagree = 1

Mean =  $\bar{X}$ , Median= Me, Mode=Mo.

**Table no. 1.7: Benefits of maintaining of healthy work life balance at work place in Frequency and in Descriptive Parameters.**

SR. No.	Benefits of maintaining benefits of healthy work life balance at work place	SA	A	N	D	SD	$\bar{X}$	Me	Mo
		%	%	%	%	%			
1.	It helps to maintain employee's mental health	86	7	7	-	-	4.28	5.00	5
2.	It ensures employee's physical health and wellbeing	72.1	20.9	7	-	-	4.65	5.00	5
3.	It brings greater employee loyalty, commitment and motivation	72.1	23.3	4.7	-	-	4.58	5.00	5
4.	It brings innovation to workplace	65.1	20.9	9.3	4.7	-	4.23	5.00	5
5.	Employees are more active both in and out of the office	72.2	25	2.8	-	-	4.56	5.00	5
6.	There is a happier and less stressed workforce	69.5	18.9	5.5	3.6	2.5	4.40	5.00	5
7.	Happy and healthy employees are more productive	69.8	30.2	-	-	-	4.63	5.00	5
8.	Happy and healthy employees can handle adversity in a better way	69.8	27.9	2.3	-	-	4.35	5.00	5
9.	Happy & healthy employees provide better services	72.1	23.3	4.7	-	-	4.63	5.00	5
10.	Happy & healthy employees create positive image	74.4	20.9	4.7	-	-	4.60	5.00	5
11.	There is lower absenteeism among the employees	67.4	27.9	4.7	-	-	4.49	5.00	5
12.	There is reduction in staff turnover and recruitment costs	69.8	25.6	4.7	-	-	4.35	5.00	5
13.	There is greater employee loyalty, commitment and motivation	74.4	14	11.6	-	-	4.40	5.00	5

Sources: Compiled from Primary Data

## INTERPRETATION

Above table no. 1.7 shows descriptive parameters such as Mean, Median and Mode related to benefits of maintaining a healthy work life balance at work place.

From the above table, it can be concluded that the Mean of benefits of maintaining a healthy work life balance at work place is above 4. Median and mode of benefits of maintaining a healthy work life balance at work place is 5.

## HYPOTHESES TESTING OF THE STUDY

### HYPOTHESIS 1

For testing above hypotheses, researcher has used One-Sample Test.

**Table No. 1.8: One-Sample Test**

	One-Sample Test (Test Value = 3)					95% Confidence Interval of the Difference
	t	d.f.	Sig. (2-tailed)	Mean Difference	Lower	
Benefits of maintaining healthy work-life balance at work place	<b>28.595</b>	<b>13</b>	<b>.000</b>	<b>1.43929</b>	<b>1.3305</b>	<b>1.5480</b>

Sources: Complied from Primary Data

## OBSERVATION

From above table no. 1.8, it is observed that  $t (13) = 28.595$ ,  $P=0.000$ .

## INTERPRETATION

P-value is 0.000 which is less than 0.05. Therefore, we reject null hypothesis and accept alternative hypothesis.

## VIII. FINDINGS OF THE STUDY

Null hypothesis has been rejected and alternative hypothesis has been accepted i.e. there are significant benefits of maintaining a healthy work life balance at work place.

## IX. CONCLUSIONS

From the above study, it can be concluded that there are several advantages of work life balance. They are: it helps to maintain employee's mental health, it ensures employee's physical health and wellbeing, it brings greater employee loyalty, commitment and motivation, it brings innovation to workplace, employees are more active both in and out of the office, there is a happier and less stressed workforce, happy and healthy employees are more productive, happy and healthy employees can handle adversity in a better way, happy & healthy employees provide better services, happy & healthy employees create positive image, there is lower absenteeism among the employees, there is reduction in staff turnover and recruitment costs, there is greater employee loyalty, commitment and motivation.

## X. SUGGESTIONS AND RECOMMENDATION

1. Job security and appreciation for every employee who perform better and do not give job to those who are not in need of Job.
2. Time management should be done effectively at work place.
3. Senior should not to dominate subordinate.
4. Leave should be sanctioned as it is very important part and rules are there by govt. Some employers don't provide it easily which gives mental stress to employees.
5. There should be proper training and promotion.
6. Don't mix work – life.
7. Present scenario showing seniors behaving dominantly and always employee facing coercion threats from seniors. So working hours should be as per international hours per day. Employee should not keep temporary for longer period. He must get salary at par.
8. One should complete given task with 100% efficiency within working hours.

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## Development and Evaluation of Self Instructional Module on Knowledge and Practices Regarding “Management of Hypertension” Among Patients with Chronic Kidney Disease in Urban Hospital

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### ABSTRACT

*Hypertension in chronic kidney disease contributes a major cause of disabilities and complications through occurrence of other cardiovascular disorders which increases the hospitalization period and can increase the risk of deaths among these people.*

*A descriptive evaluative approach with one group pretest-post test design was used. Total 30 samples of chronic kidney disease with hypertension were without any complications or any other cardiovascular diseases were selected using non probability convenient sampling technique. Tool reliability was 0.83.*

### Result

*Maximum sample that is 70% were male; 33.3% belonged to age group of 20-29 years; 100% were literate.*

*Majority of the samples that is 23.3% were having service as occupation.*

*It was concluded that there was a significant difference at 0.05 levels with regard to the knowledge and practice regarding the management of hypertension in chronic kidney disease patients with hypertension in the pretest and post test. The calculated 't' value was found to be 6.86 for knowledge and 5.75 for practice. This result supports the significance of self instructional module in the improvement of knowledge and practice of the chronic kidney disease patients in management of hypertension.*

### Conclusion

*During study it was observed that for chronic kidney disease patients with hypertension, to minimize the complications and hospitalization the self instructional module about management of hypertension is necessary. Objectives of the booklet were laid down and based on it the module was successfully developed.*

*Keywords: Self instructional module, Hypertension, Chronic kidney disease, Development, Management.*

### 1. INTRODUCTION

As per National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) results, it is quite evident that hypertension contributes to the worsening of kidney function. High blood pressure makes the kidneys fail more rapidly, regardless of a patient's sex, race, age and cause of kidney disease.

### 2. BACKGROUND OF THE STUDY

Molzahn Anita E. stated that chronic kidney disease leads to hypertension in a client due to mechanism of volume overload, stimulation of the rennin- angiotensin system, sympathetically mediated vasoconstriction and absence of prostaglandin leads to hypertension. If hypertension is not managed it may lead to left ventricular hypertrophy and CCF.<sup>(1)</sup>

### PROBLEM STATEMENT

Development and Evaluation of self instructional module on knowledge and practices regarding “Management of Hypertension” among patients with Chronic kidney disease in urban hospital.

### OBJECTIVES

1. To assess the knowledge and practices regarding management of hypertension in patients with chronic kidney disease.
2. To develop and administer a self instructional module on management of hypertension in patients with chronic kidney disease.
3. To assess the effectiveness of a self instructional module on knowledge and practices regarding management of hypertension in patients with chronic kidney disease after administration of self instructional module.

## HYPOTHESIS

**H<sub>01</sub>** = There is no significant difference in pre test and post test knowledge scores on management of hypertension in patients with chronic kidney disease after administration of self instructional module.

**H<sub>02</sub>** = There is no significant difference in pre test and post test practice scores on management of hypertension in patients with chronic kidney disease after administration of self instructional module.

## 3. RESEARCH METHODOLOGY

Research methodology deals with the methodology used in the present study which includes

**3.1 Research Approach:** Descriptive evaluative approach.

**3.2 Research Design:** one group pre test- post test design.

**3.4 Sample:** In this study, total 30 samples consisted of chronic kidney disease patients with hypertension attending dialysis unit, hypertension clinic in urban hospital were selected using non probability convenient sampling technique.

## 4. FINDINGS OF THE STUDY

Data collected has been analyzed and presented in sections based on objectives of the study. The data obtained from the samples has been classified and tabulated under the following sections.

**Table no. 1 and figure no. 1:- Distribution of samples in relation to their gender.**  
n=30

Sr. No.	Demographic Characteristics	Frequency	Percentage (%)
1.	Gender		
	• Male	21	70
	• Female	9	30



Table no. 1 and figure no. 1 shows maximum sample that is 70% were male and the female constitute the 30% of the total sample.

**Table 2 and figure no. 2:- Distribution of samples in relation to their age.**  
n=30

Sr. No	Demographic Characteristics	Frequency	Percentage (%)
2.	Age in Years		
	• 20-29	10	33.3
	• 30-39	3	10
	• 40-49	5	16.6
	• 50-59	6	20
	• 60-69	4	13.3
	• 70 & above	2	6.6

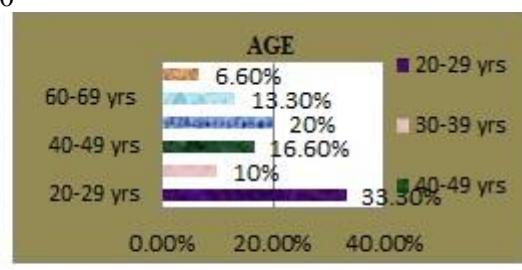


Table no.2 and figure no. 2 shows maximum sample from young age group i.e., 33.3% belonged to 20-29yr

**Table no.3 and figure no.3:- Distribution of samples in relation to education.**

Sr. No.	Demographic Characteristics	Frequency	Percentage (%)
<b>3. Education</b>			
• Primary	10	33.3	
• Secondary	8	26.6	
• Graduate	10	33.3	
• Post Graduate	2	6.6	

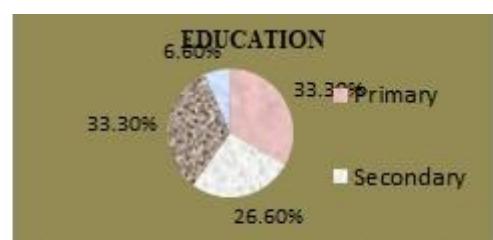


Table no.3 and figure no.3 shows 100% of the samples were literate.

Table no. 4 and figure no. 4:- Distribution of samples in relation to occupation.

Sr. No.	Demographic Characteristics	Frequency	Percentage (%)
<b>4. Occupation</b>			
Self employed	4	13.3	
Business	5	16.6	
Service	7	23.3	
Housewife	6	20	
Unemployed	5	16.6	
Retired	3	10	



Table no.4 and figure no. 4 shows majority of the samples that is 23.3% were having service, and least no 10% were retired.

## SECTION-2

Analysis and interpretation of pre and post test data related to the knowledge and practice.

Table no-5 and figure no-5:- Distribution of samples in relation to their knowledge regarding hypertension in pre test and post test.

Sr. No.	Areas of knowledge	Pre test		Post Test	
		F	%	F	%
1.	Normal BP values	26	87	30	100
2.	Meaning of hypertension	20	67	30	100
3.	Etiology of hypertension	14	47	26	87
4.	Clinical manifestations of hypertension	14	47	25	83
5.	Complications of hypertension	14	47	25	83

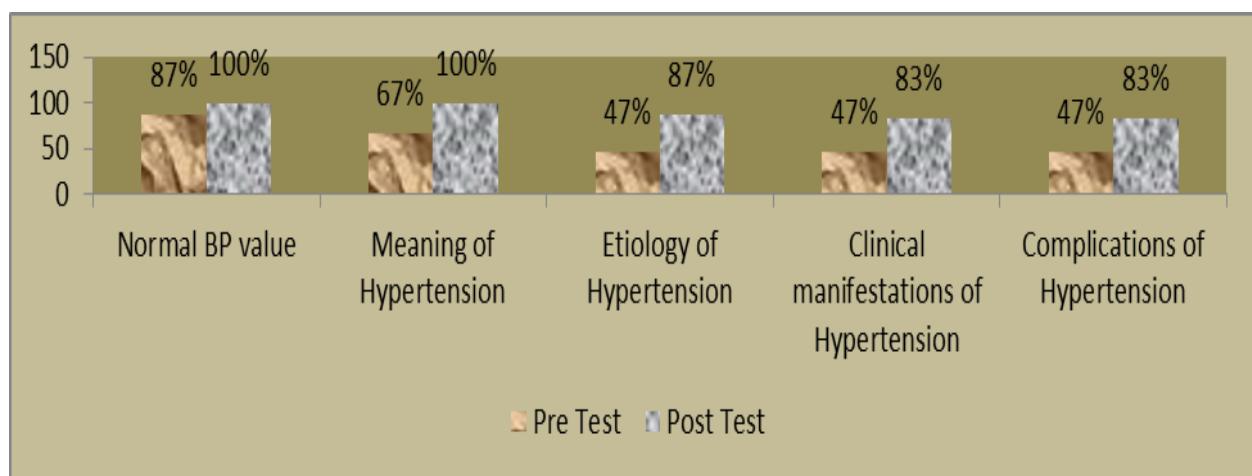


Table no. 5 and figure no. 5 shows an evidence of moderate gaps in the knowledge among the samples.

**Table no.6 and figure no. 6:- Distribution of samples in relation to their knowledge regarding chronic kidney disease in pre test and post test.**

n=30

Sr. No.	Areas of knowledge	Pre test		Post Test	
		F	%	F	%
1.	Meaning of chronic kidney disease	21	70	30	100
2.	Tests used to evaluate kidney function	24	80	29	97
3.	Etiology of chronic kidney disease	16	53	25	83
4.	Clinical manifestations of chronic kidney disease	15	50	27	90
5.	Complications of chronic kidney disease	7	23	14	47

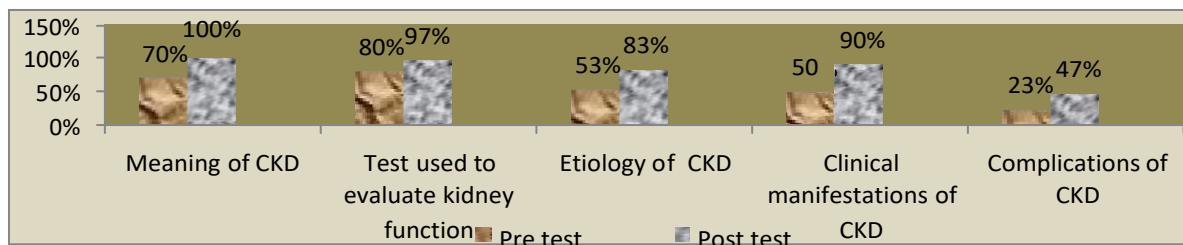


Table no.6 and figure no. 6 shows the knowledge scores related to chronic kidney disease showed improvement in it after reading the self instructional module which was given to the patient support the effectiveness of the module.

**Table no.7 and figure no. 7:- distribution of samples in relation to their self expressed practices regarding management of hypertension in chronic kidney disease in pre test and post test.**

n=30

Sr. No.	Areas of knowledge	Pre test		Post test	
		F	%	F	%
1.	Food rich in salt	24	80	29	97
2.	Diet advisable for CKD and hypertension	26	87	28	93
3.	Avoidance of smoking	3	10	15	50
4.	Measurement of obesity	14	47	28	93
5.	Good habits to reduce overweight	18	60	28	93
6.	Importance of exercise	17	57	21	70
7.	Aerobic exercises	18	60	22	73
8.	Amount of sleep required at night	20	67	26	87
9.	Care necessary to manage high BP in CKD	21	70	28	93
10.	Healthy way to manage stress	16	53	22	73
11.	Follow up care	25	80	24	85

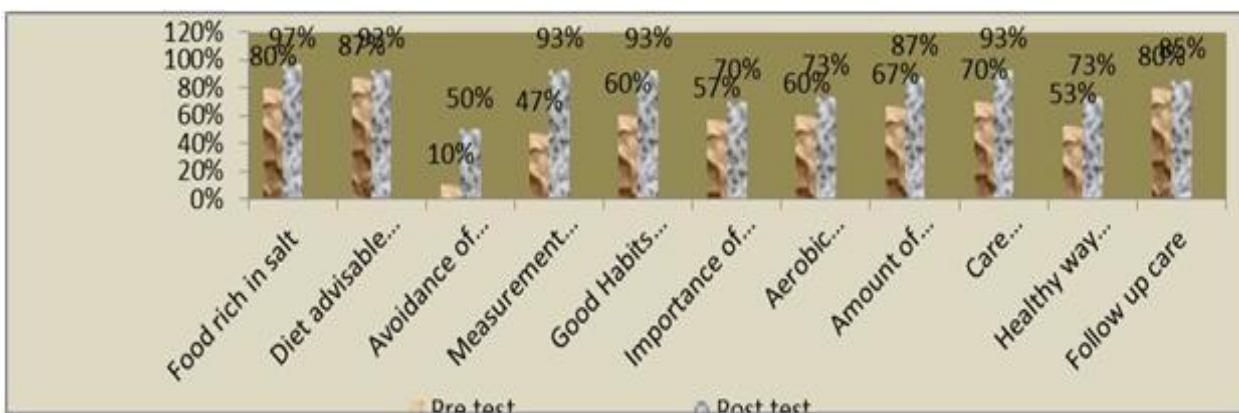


Table no.7 and figure no. 7 shows the knowledge scores related to the management of hypertension in chronic kidney disease was the poorest revealing the gross lack of knowledge.

## Part D

**Table no. 8 and figure no. 8- Distribution of samples in relation to their practices regarding management of hypertension in chronic kidney disease.**

n=30

Sr. No.	Areas of knowledge	Pre test		Post test	
		F	%	F	%
1.	Avoidance of foods to manage BP at normal	18	60	26	87
2.	Maintenance of Cholesterol level at normal	20	67	23	77
3.	Regularly taking medicine	26	87	30	100
4.	Combination of dietary changes and exercises to reduce weight	7	23	22	73
5.	Daily exercise for 15-30 min	9	30	23	77
6.	No unhealthy habits	29	97	30	100
7.	Sleeping at night for 6-8 hrs	17	57	21	70

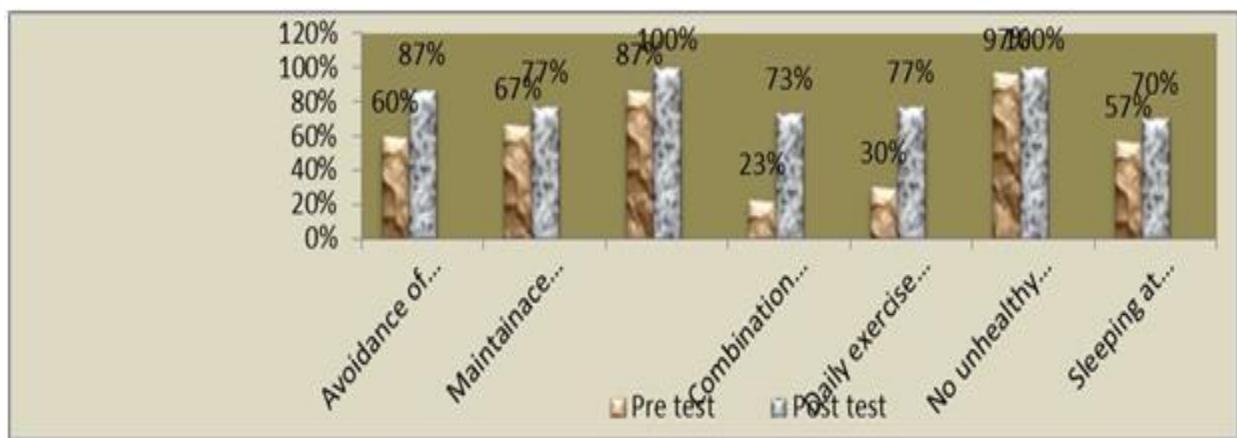


Table no. 8 and figure no. 8 suggests that the practice scores of the samples in pretest regarding management of hypertension in chronic kidney disease was improved in the post test.

## SECTION-3

Analysis of the data to determine the effect of self instructional module on knowledge and practice

**Table 9:- Effect of self instructional module on knowledge and practice of samples**

n=30

Sr. No.	Areas of knowledge	Pre test		Post test		Calculated t value
		M <sub>1</sub>	SD	M <sub>2</sub>	SD	
1.	Knowledge regarding hypertension (k1)	2.933	1.1724	4.533	0.5713	6.86
2.	Knowledge regarding CKD (k2)	2.766	1.2507	4.166	0.7466	6.01
3.	Knowledge regarding management of hypertension in CKD (k3)	6.7	1.8411	9.033	1.1885	5.97
4.	Practices related to management of hypertension in CKD. (p1)	4.233	2.4609	5.833	0.9712	5.75

$t = 2.045$

Significant at 0.05 level

Table no. 9 shows that there was a higher gain in knowledge scores regarding hypertension in chronic kidney disease ( $t = 6.86$ ), followed by knowledge regarding chronic kidney disease ( $t = 6.01$ ). The practice score was seen to be lower ( $t = 5.75$ ) than the knowledge gain with regard to management of hypertension in chronic kidney disease was seen to be ( $t = 5.97$ ).

## Part- B

This section deals with the analysis and interpretation data to find out the effect of self instructional module on the knowledge and practices of the samples.

**Table 10:- Effect of self instructional module on overall knowledge and practice of samples  
n=30**

Sr. No.	Areas of knowledge	Pre test		Post test		Calculated t value
		M <sub>1</sub>	SD	M <sub>2</sub>	SD	
1.	Knowledge score (k)	12.4	3.2012	17.33	1.7207	8.62
2	Practice score (p)	4.233	2.4609	5.833	0.9712	5.75

$t= 2.045$

Significant at 0.05 level

Table no 10 concluded that there was a significant difference at 0.05 levels with regard to the practice regarding management of hypertension in chronic kidney disease patient in the pre and post test. Thus the null hypothesis ( $H_0$ ) rejected.

## 5. CONCLUSION

During study it was observed that for chronic kidney patients with hypertension, to minimize the complications and hospitalization the self instructional module about management of hypertension is effective. The preparation of the self instructional module was a systematic process which involved a series of steps. Objectives of the module were laid down and based on it the module was successfully developed. The framework of the module was based on the identified gaps in knowledge among the samples.

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## A Descriptive Study to Assess the Effectiveness of Selected Interventions on Knowledge and Practices of Canteen Workers about Hand Hygiene from Selected Canteen of Metropolitan City

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### ABSTRACT

*The Objectives Of This Study Was To Examine Knowledge And Practices Of Canteen Workers And See The Effectiveness Of Intervention Regarding Hand Hygiene. Research Design Adopted For This Study Was Pre Experimental One Group Pre-Test And Post Test Design. 30-Canteen Workers Selected By Using Non Probability Convenient Sampling Technique From Selected Canteen. Results Of Study Illustrates As Demographic Findings Of Study Shows That Maximum Sample 10(33.3%) Were Aged Between 18-22 Years And 29 (06.6%) Were Males. Most 14(46.6%) Were Illiterate. Most 22(74.4%) Had Bad Habits, And 23(76%) Suffered From Food Borne Illness. Assessment Of Practices Showed That Majority Of Canteen Workers Were Not Following Hygienic Practices.*

*Comparison Between Pre And Post Knowledge And Pre And Post Practices Is Statistically Significant At 0.05 Levels With The Calculated 'T' Values At 9.74 For Knowledge And 9.26 For Practices. A Positive Correlation Is Seen Between Knowledge And Practice As The Calculated 'R' Value Of 0.447 Is Statistically More Than The 'R' Table Value Of 0.361. There Is No Association Between Knowledge And Practice With Age , Gender , Income, Religion ,Habit, Sources Of Knowledge And Training Programme. There Is Association Between Practice With Education And Knowledge With Experience. The Findings Of This Study Suggest That The Hand Hygiene Of The Canteen Workers Need To Be Improved. More Training/Education On Hand Washing And Hand Hygiene Of The Food Handlers Should Be Necessary.*

*Keywords:Hand Hygiene, Selected Interventions, Canteen Workers*

### 6. INTRODUCTION

SAVE LIVES : CLEAN YOUR HANDS

By World Health Organization Theme of 5th May 2017 <sup>1</sup>

Food is an essential requirement for humans but it can also be a vehicle of disease transmission, if contaminated with harmful microbes like bacteria, viruses or parasites or chemicals/toxins. Globally, billions of people are at risk of food borne diseases and millions fall ill every year. Many also die as a result of consuming unsafe food<sup>2</sup> As per Wikipedia Hand one's washing or hand hygiene is the act of cleaning hands with or without the use of water or another liquid, or with the use of soap for the purpose of removing soil, dirt, and microorganisms<sup>3</sup> Due to a heightened public awareness as a result of all types of media coverage concerning food borne illnesses, the level of training for employees working in the food industry in general needs to be increased..<sup>4</sup> Employers have a responsibility to provide a well-designed, informational training program for employees to follow while on the job.<sup>5</sup>

### 7. BACKGROUND OF THE STUDY

The world health organization (WHO) estimates up to 35% of food borne illnesses could be prevented with proper hand washing procedures; increase food has compounded the need for proper hand hygiene.<sup>9</sup> It is estimated that washing hands with soap and water could reduce diarrheal disease-associated deaths by up to 50% .<sup>10</sup> Researchers in London estimate that if everyone routinely washed their hands, a million deaths a year could be prevented <sup>11</sup>.A large percentage of foodborne disease outbreaks are spread by contaminated hands.

Appropriate hand washing practices can reduce the risk of foodborne illness and other infections.<sup>12</sup> Handwashing can reduce the risk of respiratory infections by 16%.<sup>13</sup> The use of an alcohol gel hand sanitizer in the classroom provided an overall reduction in absenteeism due to infection by 19.8% among 16 elementary schools and 6,000 students.<sup>14</sup>

## STATEMENT

“A descriptive study to assess the effectiveness of selected interventions on knowledge and practices of canteen workers about hand hygiene from selected canteen of metropolitan city”

## OBJECTIVES

1. To assess pre & post knowledge & practice regarding hand hygiene among canteen workers.
2. To assess present status regarding hand hygiene among the canteen workers.
3. To find out the effectiveness of selected interventions on the knowledge and practices about hand hygiene in canteen workers.
4. To find out co-relation of knowledge & practices about hand hygiene among canteen workers.
5. To find out the association of the knowledge and practice score with selected demographic variables about hand hygiene in canteen workers.

## HYPOTHESIS

$H_0$ ..There will be no significant effect of selected intervention on knowledge and practices about hand hygiene among canteen workers.

## 8. RESEARCH METHODOLOGY

In the present study, a qualitative-descriptive research approach and a descriptive one group pretest- posttest design was used. Selected intervention on knowledge and practices regarding hand hygiene is an independent variable, and the knowledge and practices of Food handlers working in canteens regarding Hand Hygiene is a dependent variable. Setting- canteens of a tertiary Hospital. The sampling technique used by researcher was non probability convenient sampling and selected 30 canteen workers as sample

## 9. EQUATIONS, FIGURES AND TABLES

The findings have been illustrated in the following graphs and tables

**Table-1: Distribution of Canteen workers according to their demographic data Age, Gender, Education, Experience and Family Income.**

N = 30

Demographic data	F	%
<b>Age</b>		
18-22 yrs	10	33.3
23-27 yrs	9	30
28-32 yrs	2	6.6
32-40 yrs & above	5	16.6
40 yrs & above	4	13
<b>Gender</b>		
Male	29	96.6
Female	1	3.3
<b>Education</b>		
Illiterate	14	46.6
Primary	8	26.6
Secondary	6	20
Higher secondary	2	6.6
<b>Experience</b>		
< 6 mths	7	23.3
6-12 mths	3	10
1-5years	14	46.6
>5years	6	20

<b>Family Income per month</b>			
3000 to 6000 Rs.	3	10	
6001 to 9000 Rs.	11	36.6	
9001 to 12000 Rs.	8	26.6	
120001 Rs. & above	8	26.6	

Demographic findings of Age, Gender, Education, Experience and Monthly family Income of Canteen workers are shown in figure 1. It depicts that maximum Canteen workers 10(33.3%) were aged between 18-22 yrs, and minimum 2 (6.6%) Canteen workers were aged between 28-32 yrs. Gender data shows almost all 29(96.6%) Canteen workers were males. Education data shows that majority 14 (46.6%) Canteen workers were illiterates, most 14 (46.6%) canteen workers had an experience of 1- 5 years. . Family Income per month data shows that majority 11(36.6%) Canteen workers had Family Income between 6001 to Rs. 9000 / month.

**Table-2: - Distribution of Canteen workers according to their habits and infection in past.**

N = 30

<b>Demographic data</b>	<b>F</b>	<b>%</b>
<b>Habits</b>		
Tobacco	8	26.6
Gutkha	3	10
Alcohol	1	3.3
Smoking	5	16.6
All above	5	16.6
No habit	8	26.6
<b>If suffered any infection in past</b>		
Diarrhoea, dysentery	3	10
Jaundice	3	10
Typhoid	3	10
Cholera	1	3.3
Hepatitis	1	3.3
Skin Infection	4	13.3
Any Other	8	26.6
No infection	7	23.3

Above table 2 displays data of canteen workers about their habits and If suffering from any illness in past. Majority 8(26.6%) canteen workers had the habit of chewing tobacco. Regarding history of any illness in past, 3 (10%) canteen workers each had history of Diarrhea, Jaundice and Typhoid respectively.

**Table-3: Distribution of Canteen workers according to the areas of hygienic practices maintained by them.**

N = 30

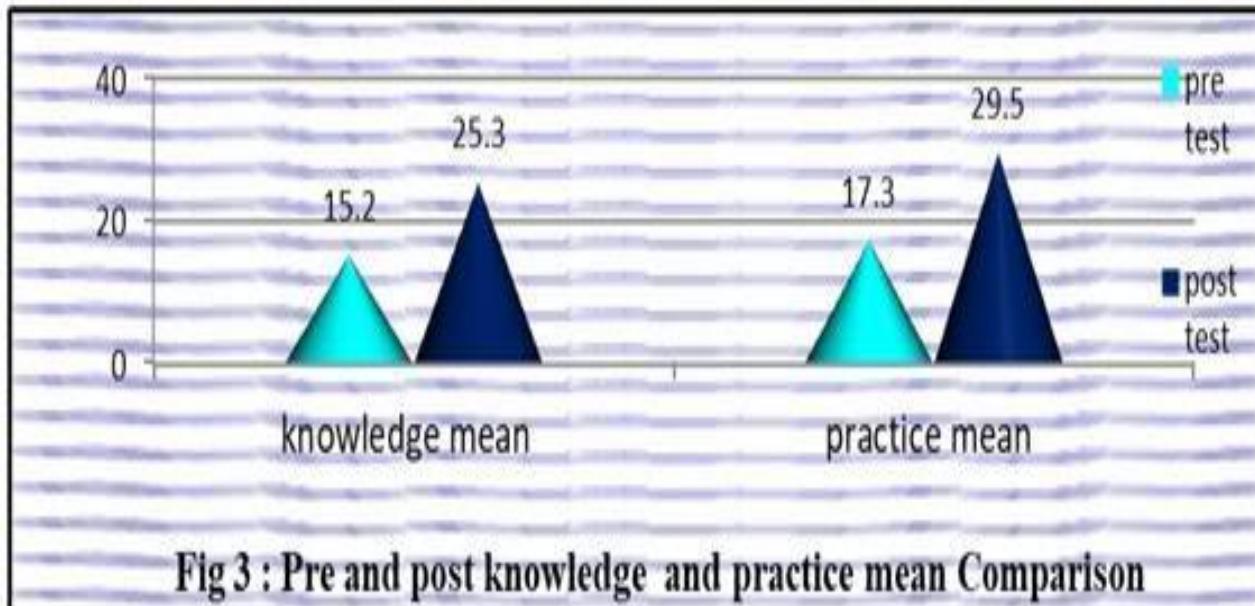
<b>Sr. no.</b>	<b>Areas of hygienic practices</b>	<b>YES</b>		<b>NO</b>	
		<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>
1	Personal hygiene maintained well	10	33.3	20	66.7
2	Cloths were unclean and dirty	13	43.3	17	56.7
3	Odour badly /sticking	26	86.7	4	13.3
4	Big nails and dirt accumulated	30	100.0	0	0.0
5	Cuts on hands and foot	21	70.0	9	30.0
6	Wet & dirt in webs of fingers	30	100.0		0.0
7	Skin infection	7	23.3	23	76.7
8	Fingers and palm had rashes	16	53.3	14	46.7
9	Had cough cold and fever/diarrhoea	2	6.7	28	93.3
10	White hands due to allergy or continuous working in water	23	76.7	7	23.3
11	Dirty ,wet and unclean napkin used	30	100.0	0	0.0
12	Vaccination completed	8	26.7	22	73.3
13	Medical check up regularly	0	0.0	30	100.0

The Hygienic practices maintained by the canteen workers is depicted in table no. 3. It shows that most of the canteen workers 20( 66.7%) didn't maintain their personal hygiene well, 26( 86.7%) of canteen workers were emitting bad odour and all 30 (100%) of canteen workers each had big nails with dirt and had wet fingers with dirt accumulated in webs of fingers. 21(70%) of canteen workers had Cuts on hands and foot, 22(73.3%) of canteen workers didn't complete their vaccination course and 23( 76.7%) of canteen workers had white hands. All 30 (100%) of canteen workers used dirty ,wet and unclean napkins and also all 30 (100%) of canteen workers didn't go for medical checkup regularly. Very few 7(23.3%) of canteen workers had skin infection and 16(53.3%) of canteen workers had rashes on fingers. It is observed that most of the canteen workers were not adhering to the hygienic practices in almost all the areas of practices.

**Table-3: Effectiveness of selected interventions on hand hygiene among canteen workers by comparing pre test and post test overall Knowledge and practice scores**

N = 30

Comparison		Mean	t value	P
Overall Knowledge	Pre	15.2	9.74	0.001
	Post	25.3		
Overall Practice	Pre	17.3	9.26	0.001
	Post	29.5		



**Fig 3 : Pre and post knowledge and practice mean Comparison**

The data displayed in table 3 and conical graph 3 highlights the significant difference in the mean of pre and post test knowledge and practice scores of the canteen workers. Before calculating the 't' value Null hypothesis ( $H_0$ ) and alternate hypothesis ( $H_1$ ) was stated. The two tailed table 't' value for 0.05 level of significance is at 2.05 for degree of freedom 29. The calculated 't' value was found to be 9.74 for knowledge and 9.26 for practice. As the calculated value for both knowledge and practice is statistically greater than the table 't' value so null hypothesis ( $H_0$ ) is rejected and alternate hypothesis ( $H_1$ ) is accepted for knowledge and practice. The post test knowledge and practice mean is statistically more than the pre test knowledge and practice mean. This suggest that selected interventions is effective in improving knowledge and practice regarding hand hygiene among canteen workers .

**Table-4: Correlation between Knowledge and Practice regarding hand hygiene among Canteen workers.**

Correlation	n	Pearson calc. Value 'r'	Pearson table value 'r'	p value
Knowledge	30	0.561	0.361	0.001
Practice	30			

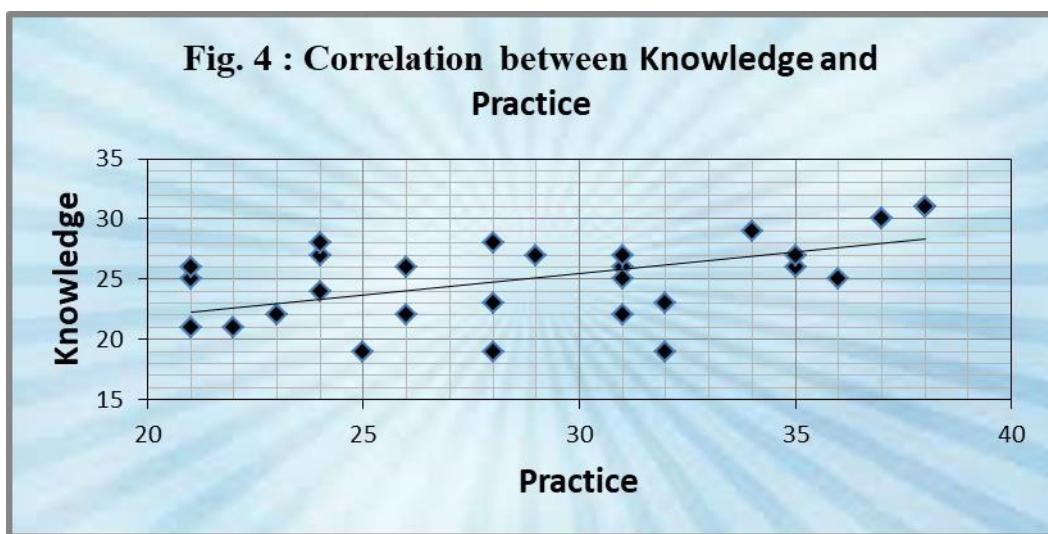


Table 4 and scatter plot 4 depicts the correlation between knowledge and practice among Canteen workers regarding hand hygiene by Pearson's correlation method. It is seen that the Pearson's table ( $r$ ) table value is 0.361 at a level of significance 0.05 with no of pairs being 30. The calculated ' $r$ ' value of 0.561 is more than the ( $r$ ) table value 0.361. Hence there is a statistically significant positive correlation between knowledge and practice of Canteen workers regarding hand hygiene.

#### Association of demographic variables with Knowledge and Practice.

The ANOVA Test is used to find out if any association exists between the demographic variables and Knowledge and Practice.

Knowledge of Canteen workers regarding hand hygiene is independent of Age, Family Income per month, Habits and Any Infection in past, but is dependent on Education and Experience. Practice of Canteen workers regarding hand hygiene is independent of Age, Education, Experience, Family Income per month, Habits and Any Infection.

#### 10. CONCLUSION

More training/education on hand washing and hand hygiene of the food handlers should be necessary. more researches were the need of time in this area

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## Supply Chain Management Practices in Health Care Services

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### **ABSTRACT**

*This paper focuses on the Supply chain Management practices with regard to the Health Care services and also includes the logistics process in hospitals and major improvements in health care services. The paper signifies the importance and proper application of SCM practices which can improve the quality of services to patients and also reduce costs.*

*Keywords: Health care, SCM, Service sector, Hospitals, RFID*

### **INTRODUCTION**

In India the service sector industry contributes more to the GDP when compared to agriculture and Industry. Around 64% is from the services industry and has become the highest contribution to our economy. Health care is gaining momentum and there is a steady increase in demand both from the domestic front as well as medical tourism sector. An apt representation of health care service is the health care industries which has a significant bearing in the contribution towards the Gross Domestic Product of India. It has become one of the largest sectors provide revenue as well as employment and health care can be categorized into:

1. Hospitals
2. Medical devices
3. Clinical trials
4. Health insurance
5. Medical equipment .

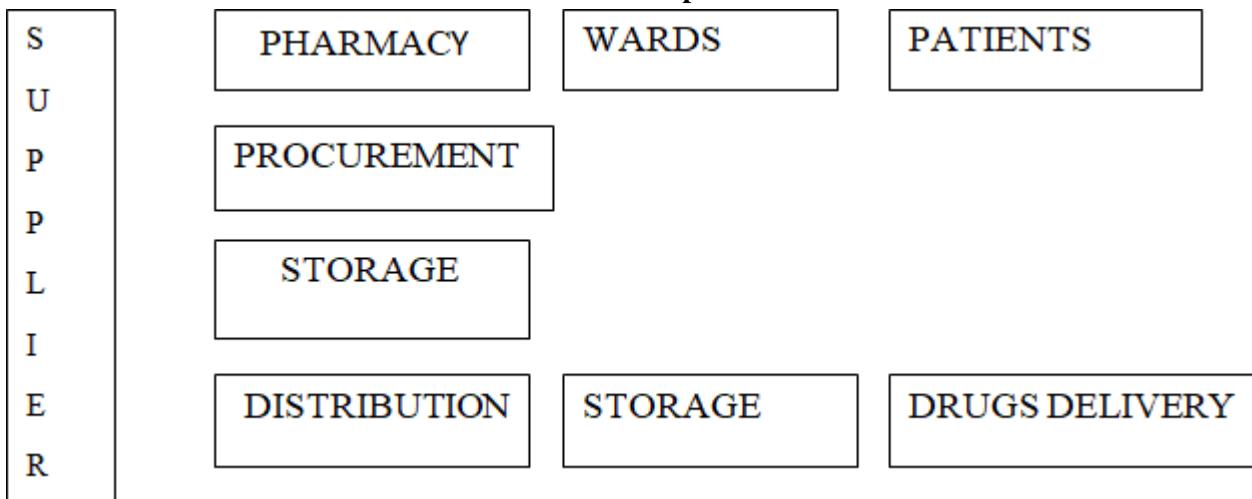
Here, healthcare can be divided into two sectors that are public and private. In case of Public sector the main motive would be to offer primary health care and basic medical attention in rural areas and are mainly located in key cities. As far as private sectors are concerned, they will operate mostly in metro cities like the tier I and tier II cities. When compared to Asia and Western countries, India is a country which is more cost competitive. A surgery is less costly with regard to US and Western Europe.

India has the largest population after China, with the population of about 1.21 billion <sup>[II]</sup>. The provision of healthcare to the people is the major challenge with such huge population. If one wants to cater to the health care needs of the people, the country needs strong planning and management and should also abides and comply with the government bodies along with the private healthcare providers.

### **The process of SCM in health care**

The healthcare supply chain primarily focuses on delivering products and services in a timely manner. The healthcare SCM generally starts with manufacturers and ends with healthcare providers and based on the type of services demanded either the producer or manufacturer can directly deliver to the healthcare providers or can also deliver the services through number of chains. A traditional healthcare supply chain has number of different players and is highly fragmented and is not aligned properly which makes it difficult for the players to operate as a whole.

**Figure I**  
Healthcare SCM process <sup>[3]</sup>



In the era of competition, all the industries focus on reducing expenses whenever and wherever possible and the same goes for the healthcare providers. The rise in price of the products and services makes it difficult for the providers to reach the mass. The SCM in the industry is quite a task and is complex and is difficult to find ways to reduce the inefficiency and costs. In order to reduce costs, improve efficient patient services and provide enough service quality, they should have complete knowledge, visibility and information of all the players involved in SCM healthcare like the suppliers, manufacturers, distributors and customers.

Due to the highly unorganized system with so many barriers, to adopt SCM practices in healthcare becomes a challenge. Regulatory agencies like Federal Drug Administration and healthcare payers like Medicare and health insurance determine if the particular service will be suitable for medical purposes and whether the providers will pay back to use it on patients needed.

**According to James Spann**, Practice Leader of Supply Chain and Logistics at Simpler Healthcare in 2015 said “Supply chain is the management of upstream and downstream relationships, with suppliers and customers to deliver superior value at less cost to the supply chain as a whole”.

Health care services are very particular about the products they purchase and stock as each of the stakeholders has their own preferences and the financial managers of these healthcare services are keen in cutting costs and try to keep away the expired and outdated products.

**Boyer et al** (2005); Ketchen and Guinipero (2004) opines that the competition is not restricted to “Brand Vs Brand” or “Store Vs Store” but it is Supply Chain Vs Supply Chain.

**Beier, 1995** is of the view that the application of supply chain management practices in the health care sector not only relates to physical goods like drugs, pharma, medical devices and health aids but also to the flow of patients.

Another important aspect is the co-ordination of all the departments and ensuring of them is on the same understanding with the goals of the organization. Even though other service industries operate on profit maximization basis, healthcare industry also try to reduce costs by decreasing waste and inventory stocking. This can be better executed if the providers also work along to provide efficient services, reduce costs and hence performance.

## Logistics Services

Now the hospitals have become trendier and have become customer-centric. Approaches do differ from country to country, organization to organization but their main motive would be to provide efficient supply chain services. A health care centre is said to run efficiently when the organization function better with limited resources. Internal logistics are more complex than external logistics where the staffs devote more time in providing logistics services rather than spending time with patients to provide care.

## Vendor- Managed Inventory

Vendor managed inventory does not fully transform the healthcare supply chain perfectly, but it does have an impact on cost reduction and can improve service. The VMI provides the hospital the opportunity where the vendor's staff can work at the hospital and take care of orders, manage materials and other logistics needs. Since the vendor operates inside the hospital, the movement of supplies need not go in and out of warehouse and the supplies include food, medical devices and many more.

**According to Achryilu et al.,** (2012), for the services to be best effective, the clinical operations and non – clinical operations have to be interlinked.

There are 2 aspects in health care industry one is the medical aspect and the second is hotel or catering facilities. The patients must be fed during their in the medical facility. Every hospital in the country should ensure the best quality of food served to the patients. Now hospitals have started serving food based on patient's requirements and ensure the food served is of the best quality. India's food safety regulators are always on the watch to ensure food safety. **The Food Safety and Standards Authority of India** that already has a hold on food consumed by household, industries and other places offering food, is also stressing regulations on health care industry and wants them to abide.

India has 35, 416 government hospitals and 1.37 million beds and of all these 26, 604 government hospitals are in rural areas and they have canteens that serve food to patients.<sup>[5]</sup>

## IT in Health Care

Even though the IT side of the healthcare seems to lag behind, the services are trying to patch up along with other services industry that are good at adopting the IT practices. For an instance, ambulance services have started to use GPS technology and other wireless network and technology. Nowadays doctors have started prescribing medicines and consulting through electronic devices. The advancements in the electronic consulting have led way to decreased clinical errors, improve service quality and can also consult with patients from anytime and anywhere. Even though the IT is not an integral part of health care, due to the heavy competition from the other hospitals, they are forced to implement IT in order to stay ahead in the competition.

## RFID in Health Care

Hospitals are a place where number of people physically present will be high. In order to manage those tough situations, it is always better to have tracking equipment in order to manage the pressure. Few mobile items can be kept in track and can ensure that they remain physically inside the building by real monitoring using RFID devices. This will also help the staff to locate items when in need of them immediately in critical situations. RFID are well more reliable, efficient and even more accurate than the manual tracking that required multiple storage to function.

A digitalized hospital where all the information is stored at one place and are retrieved whenever necessary. RFID plays a very important role mainly in operation theatres as it is very much important to have everything ready to start a procedure. With the help of RFID, different medical devices can be tagged together and monitored for patient's safety.

## AI in Healthcare

In the present era, making use of AI helps to make work easier and simpler. There is a huge change in the healthcare industry after the advancement of AI where it solves the problems of the doctors, patient, hospital management and the whole healthcare industry. AI works based on data, as all the industries deals with numbers which will be very difficult for the human brain to process manually and this machine predicts and gives effective conclusions. AI is expected to grow to \$372 billion by 2022.<sup>[8]</sup> AI have its own benefits at the same time it involves huge investment and lots of research needs to be undertaken in case of healthcare industry.

## CONCLUSION

The present day healthcare services are now facing tremendous competition like any other industries. They are in constant search for advancements in areas of quality and technology so as to keep in par with other healthcare industries. Healthcare industry also works on reducing cost without having to make a compromise in quality of health care services provided. With the present scenario it is advisable to adopt the best SCM practices and also the importance to make use of the technology in the best possible way in order to improve the domain as well as reduce the manual work and error to a great extent.

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## Effectiveness of Self-Instructional Module (Sim) on Awareness Regarding Tuberculosis and its Dot's Therapy Among the Pulmonarytuberculosis Patients Residing at Rahata Taluka

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### ABSTRACT

**Background:** *Tuberculosis is a curable and preventable disease and yet it causes significant morbidity and mortality, which is a cause of serious concern.* **Aims and objectives:** *A study was planned to assess the awareness of tuberculosis and DOT's therapy among pulmonary tuberculosis patients, to evaluate the effectiveness of self-instructional module on pulmonary tuberculosis patients and to compare the awareness with their selected sociodemographic variables.* **Material and Methods:** *Fifty pulmonary tuberculosis patients in the age group of 35 - 65 years were studied. They were assessed for the awareness of tuberculosis and DOT's therapy withstructure interview for 50-60 min each. The post-test was carried out on seventh day by using structured dichotomous questionnaire.* **Results:** *Statistically significant increase in awareness level was found. There was significant association was found with education and duration of tuberculosis.* **Conclusion:** *Our results indicate that the effects of self-instructional module increase the awareness. It is essential effective tool in order to bring a positive health outcome in pulmonary tuberculosis patients.*

**Keywords:** Assess, awareness, effectiveness, SIM and Pulmonary tuberculosis

### 1. INTRODUCTION

A disease is any abnormal condition that causes a disruption in the functions of a body tissue, organ, or entire organism. Diseases are recognized by a specific set of symptoms. Think about the diseases you know: a cold, the flu, measles, cancer, stroke, or diabetes, just to name a few. These diseases all disrupt the body in very characteristic ways. Now think about what causes these conditions: viruses, bacteria, fungi, smoking, genetic defects, etc.<sup>[1]</sup>

Communicable diseases are spread from person to person or from animal to person. The spread or transfer can happen through the air, through contact with contaminated surfaces, or through direct contact with blood, feces, or other bodily fluids. It may probably identify other communicable diseases. If a disease is caused by viruses, bacteria, fungi, or protozoa it's likely, although not always, communicable. Rabies, HIV, malaria, influenza, and athlete's foot are just a few examples of communicable diseases<sup>[1]</sup>

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis* (MTB). Tuberculosis generally affects the lungs, but can also affect other parts of the body. Most infections do not have symptoms, in which case it is known as latent tuberculosis. About 10% of latent infections progress to active disease which, if left untreated, kills about half of those infected. The classic symptoms of active TB are a chronic cough with blood-containing sputum, fever, night sweats, and weight loss.<sup>[2]</sup>

The disease usually develops in the lungs, although there are extra-pulmonary cases where the bacilli infect other parts of the body, usually the lymph nodes, bones, central nervous system, and cardiovascular and gastrointestinal systems. Major symptoms of TB are: prolonged cough, bloody expectorations, chest pain, and changes in a person's general health status. Coughing, sneezing, talking, and spitting can all spread the bacilli into the air, where they can remain viable for several hours before being inhaled by another person.<sup>[8]</sup>

The two antibiotics most commonly used are Isoniazid and Rifampicin, and treatments can be prolonged, taking several months. Initial empiric treatment of TB, start patients on a 4-drug regimen: Isoniazid, rifampin,

Pyrazinamide, and either Ethambutol or streptomycin. Once the TB isolate is known to be fully susceptible, Ethambutol (or streptomycin, if it is used as a fourth drug) can be discontinued. <sup>[4]</sup>

## 2. BACKGROUND OF STUDY

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis* (MTB). Tuberculosis generally affects the lungs, but can also affect other parts of the body. Most infections do not have symptoms, in which case it is known as latent tuberculosis. About 10% of latent infections progress to active disease which, if left untreated, kills about half of those infected. The classic symptoms of active TB are a chronic cough with blood-containing sputum, fever, night sweats, and weight loss.<sup>[2]</sup> India is the highest TB burden country with World Health Organization (WHO) statistics for 2011 giving an estimated incidence figure of 2.2 million cases of TB for India out of a global incidence of 9.6 million cases.<sup>[7]</sup>

### Problem Statement

A study to assess the effectiveness of self-instructional module (SIM) on awareness regarding tuberculosis and DOT's therapy among pulmonary tuberculosis patients residing at Rahata Taluka.

### Objectives

1. To assess the existing knowledge on TB and its DOTS therapy among pulmonary TB Patients.
2. To determine effectiveness of self-instructional module on awareness of tuberculosis and its DOTS therapy among pulmonary TB patients.
3. To correlate post-test awareness on tuberculosis and DOTS therapy with the selected socio demographic variables.

### Hypotheses

H<sub>1</sub>: There is a significant difference in awareness on tuberculosis and DOTs therapy before and after implementation of Self-instructional module.

H<sub>01</sub>: There is no significant difference in awareness on tuberculosis and DOTs therapy before and after implementation of Self-instructional module.

H<sub>2</sub>: There is a significant association between awareness of tuberculosis and DOTS therapy with the selected socio demographic variables.

H<sub>02</sub>: There is no significant association between awareness of tuberculosis and DOTS therapy with the selected socio demographic variables.

## 3. RESEARCH METHODOLOGY

A quasi experimental study, pre-test post-test design without control group approach was undertaken in Rahata, Loni B.K, Babhleshwar and Kolhar B.K villages of Rahata tehsil. Approval by ethical committee of IEC/ IRC was obtained. A total of 50 pulmonary tuberculosis patients were selected with help of purposive sampling technique. The nurse investigator conducted structure interview for 50-60 min to collect data. Awareness was assessed with dichotomous questionnaire followed by self-instructional module was distributed to the pulmonary tuberculosis patients. The effectiveness of self-instructional module was assessed by conducting post-test on 7 days after the pretest. The data was analysed with descriptive and inferential statistics wherever required.

## 4. EQUATIONS, FIGURES AND TABLES

The findings have been illustrated in the following tables and graphs

**Table-1: Distribution of pulmonary tuberculosis patients according to their demographic data Age, Gender, Education, Income and Duration of tuberculosis (since Diagnosis) as shown in Table 1.**

Demographic data	Frequency	Percentage%
<b>Age</b>		
≤ 35	15	30
36-40	17	34
41-45	5	10
46-50	9	18
51-55	3	6

$\geq 56$	1	2
<b>Gender</b>		
Male	31	62
Female	19	38
<b>Education</b>		
No formal education	10	20
Primary	06	12
Secondary	15	30
Higher secondary	15	30
Graduation and Above	04	08
Any other -----	00	00
<b>Income</b>		
$\leq 3000$ Rs	16	32
3001-6000 Rs	11	11
6001-9000 Rs	17	34
$\geq 9000$ Rs	06	12
<b>Duration of tuberculosis (Since Diagnosis).</b>		
$\leq 6$ months	11	22
$\geq 6$ months	39	78

Table 1: Highest percentage (34%) of patients were 36-40 years of age, Majority (62%) were males, (30%) equal percentage secondary and higher secondary education, (34%) had monthly income 6001-9000 Rs, highest percentage (78%) more than 6 months of Duration of tuberculosis.

**Table 2: Effectiveness of self-instructional module: statistical analysis as shown in Table 2.**

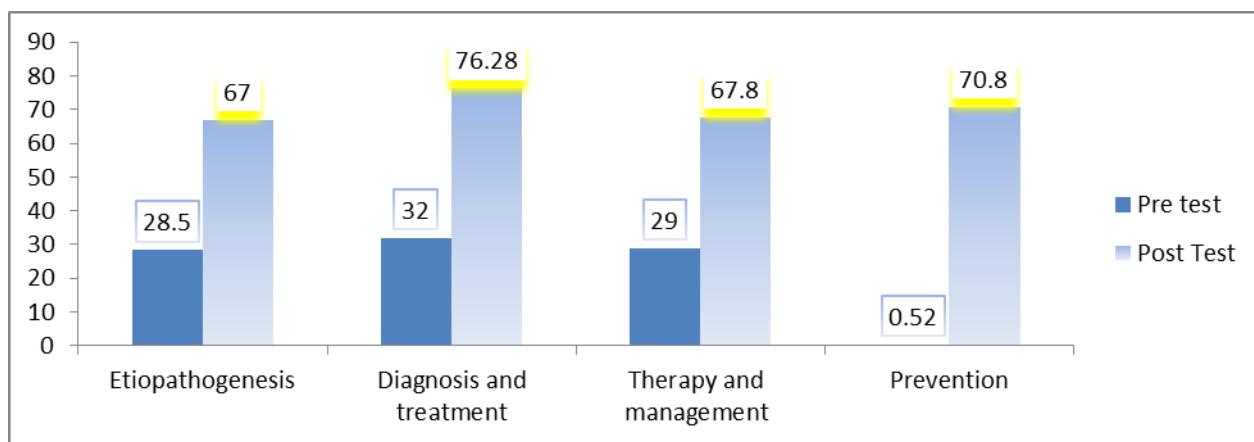
Before counseling	After counseling	't' value	
		Mean $\pm$ SD	Mean $\pm$ SD
8.5 $\pm$ 2.35	20.92 $\pm$ 1.17		33.85* (p < 0.05)

Significant\*

Table 2: There was a significant improvement in level of awareness score after the self-instructional module. ( $t=33.85$ ,  $p<0.05$ ) (Table-I) However, the self-instructional module was more effective in various aspects. (Table-II) The level of awareness had significant association with the education and duration of tuberculosis ( $p < 0.05$ ).

**Table-3: Area wise comparison of mean, SD, Mean % of pre-test and post-test awareness score of Tuberculosis and Dots therapy.**

SN	Area	Max. score	Pre test			Post test			Difference in Mean %
			Mean	SD	Mean %	Mean	SD	Mean %	
1	Etiopathogenesis	8	2.28	0.79	28.5	5.36	0.71	67	38.5
2	Diagnosis and treatment of Tuberculosis	7	2.24	1.03	32	5.34	0.47	76.28	44.28
3	Dot's therapy and management of side effects	10	2.9	1.38	29	6.78	0.63	67.8	38.8
4	Prevention of tuberculosis	5	1.24	0.52	24.8	3.54	0.50	70.8	46
<b>Overall</b>		<b>30</b>	<b>8.5</b>	<b>2.35</b>	<b>28.33</b>	<b>20.92</b>	<b>1.17</b>	<b>69.73</b>	<b>40.81</b>



**Table 3 and Fig. 1:** Comparison of the pre-test and post-test mean score shows that the effectiveness of self-instructional module by the post-test mean % was (69.73) indicates the pulmonary tuberculosis patients had 'good' awareness which is higher than pre-test mean% (28.33%). Shows that the SIM was effective in improving the awareness level on tuberculosis and DOT's therapy.

**Table 4: Paired 't' value of pre and post test awareness of pulmonary tuberculosis patients**

SN	Awareness Area	't' value	Level of significance
1	Etiopathogenesis	21.04	Significant
2	Diagnosis and treatment	20.69	Significant
3	DOT's therapy side effects and management	19.30	Significant
4	Prevention tuberculosis	20.71	Significant
<b>Overall</b>		33.85	Significant

df=49, table value =2.01, p=  $\leq 0.05$

**Table 4:** Paired t value was calculated to analyze the difference in pre test and post test awareness score of pulmonary tuberculosis patients on different aspects of tuberculosis and Dot's therapy. Highly significant difference was found between the awareness score of pulmonary tuberculosis patients ('t' value =33.85). Hence the stated null hypothesis ( $H_01$ ) was rejected as it is interpreted that there was significant difference between pre test and post test knowledge scores. Thus the difference observed in mean awareness score was true difference not by chance.

**Table-5: Association between the post-test awareness score tuberculosis and Dot's therapy with demographic variables**

SN	Variables	$\chi^2$	Level of significance
1	Age	0.35	Not Significant
2	Gender	0.25	Not Significant
3	Education	<b>4.23</b>	Significant
4	Duration of TB	<b>6.21</b>	Significant
5	Treatment of TB	0.28	Not Significant

df = 1, table 3.84,  $p \geq 0.05$ , not significant

**Table 5:** Chi square values were calculated to find out the association between the post test awareness score with demographic variables of pulmonary tuberculosis patients. The findings revealed that there was no significant association between awareness score and socio demographic variables like age, gender, treatment of TB. However a significant association was found between the awareness score and demographic variables like education ( $\chi^2 =4.23$ ) and duration of TB (since diagnosis) ( $\chi^2 =6.21$ ). Hence the stated null hypothesis ( $H_02$ ) was rejected as there was a significant association between awareness score and their selected socio-demographic variables.

## 5. CONCLUSION

From the present study, the results revealed that the SIM was found to be effective in improving the knowledge of pulmonary tuberculosis patients on tuberculosis and DOT's therapy. So, it should be emphasis that having educational session with the patients along with family members regarding Tuberculosis and Dot's therapy

improves their awareness. These leads to a regular treatment, preventing measures and care and thus reduce the lack of awareness and less chance of health problems and complications there by leading a complete cure and longer survival and reduce the health care cost.

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## An Organ Donation in India: Current Status QUO

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### ABSTRACT

*We all are known but unknown about ORGAN DONATIONS. In 20<sup>th</sup> century organ donation is miracle of medical science but in which high demand of organs and low supply. Cause off lack of social awareness, duty and responsibility. Organ donations is the process when person allow legal permission to removed their own organ and transplanted to another person either by consent while the donor is alive or dead with the assent of the heir to inheritance. Due to non-availability of organs 5,00,000 people are die annually in India, it shows that it is immense needs of organ donation. This paper explores the present status of organ donation in India and the researcher enlisted different kinds of organ donors. And also analyze legal aspects and process of organ donation. It helps to create awareness and social responsibilities among the society.*

**Keywords:** Organ, Donation, India, Transplant.

### INTRODUCTION

During this century man can gives organ to another and save life. Mother gave birth one time but now any human give reincarnation to other. It is possible due to advance medical research. It is first important to know organ transplant then to know about organ donation. A transplant is medical operation where one person's dysfunctional organ or tissue is replaced by that of a healthy person, thus restoring its function. Organ donation is donate of an organ to a person with end stage organ and who needs a transplant. Transplants improve the quality of life of patient and give them another chance to live. While most organs that are transplanted are from deceased donors, patients may also receive organs from living donors. Living persons can donate a kidney, portions of the liver, lung, pancreas, intestines, blood, and still continue to live a normal life.

The first living organ donor in a successful transplant was Ronald Lee Herrick (1931–2010), who donated a kidney to his identical twin brother in 1954. The youngest organ donor was a baby with anencephaly, born in 2015, who lived for only 100 minutes and donated his kidneys to an adult with renal failure. The oldest known organ donor was a 107-year-old Scottish woman, whose corneas were donated after her death in 2016. The oldest known organ donor for an internal organ was a 92-year-old Texas man, whose family chose to donate his liver after he died of a brain hemorrhage. The oldest altruistic living organ donor was an 85-year-old woman in Britain, who donated a kidney to a stranger in 2014. Organ donation in India, has relatively short and late history compared to the developed world. The First kidney transplant performed in India was done at the King Edward Memorial Hospital at Bombay in May 1965, using a cadaver donor in a non-renal failure patient who had had hypernephroma.

### OBJECTIVE OF THE STUDY

- I) To analysis a present status of organ donation in India.
- II) To understand the legal aspects of organ donation.
- III) To enlisted different kinds of organ donors.
- IV) To Study would be help to create socio-humanities point of view.

### Present Status of Organ Donation in India

500,000 people die because of non-availability of organs

- 200,000 people die of liver disease
- 50,000 people die from heart disease
- 150,000 people await a kidney transplant but only 5,000 get one
- 1,000,000 lakh people suffer from corneal blindness and await transplant

There is wide a gap between number of organ required and the organs available. Over the years the numbers of deceased donors has only threefold increase. Organ donors across India in 2013, 2014 and 2017 were 313, 411

and 905 respectively. As per Indian populations (130 crores) demand of organs and tissues are very high but very low supply. Donation of organs rate compare to world is very low. In India 29 states and 7 union territories in which only few are doing well in organ donation mission. In 2017 Tamil Nadu perform best in organ donation such as 176 donors donated 673 organ. Tamil Nadu government making some rules and regulations like declaration of brain death mandatory, green corridors set up and implementing transplant guidelines to centralized waiting lists. Tamil Nadu government is imitatively taking counseling and awareness in organ donation. Organ donation rate in India to be 0.5 per million populations and up to 2018 was 0.8, it is positive sign for India but as compare to western countries very poor condition in India. Western countries like Spain, USA, China, Germany, Australia and Brazil who are way ahead when it comes to organ donation. Like Spain is highest rate of organ donation at 46.9 per million populations in the world, second USA has 31.96 rate, followed by Australia and Brazil at 20.70 and 16.60 respectively.

## **The Legal Aspects of Organ Donation**

Indian Government legalized organ donation and transplantation in 1994. The Indian government enacted the Transplantation of Human Organs Act, 1994, which allows organ donation, and legalized the concept of 'brain death'. Transplantation of Human Organs Act not adopted by Andhra Pradesh and J & K, who have their own similar laws. As per THOA organ source may be:

- Mother, Father, Son, Daughter, Brother, Sister and Spouse as near relative donor
- Other than near relative donor in such cases approval of the authorization committee
- Deceased donor, especially after Brain stem death e.g. injured brain in accident etc. But heart and other organs good functional condition. Other type of deceased donor could be donor after cardiac death.

After natural cardiac death only 4 to 6 organs or tissues as Cornea, Bone, Skin and blood vessels etc. can be donated but after brain stem death maximum 35 to 37 different organs and tissues such as Liver, Kidney, Heart and Lungs. Parliament of India Amending THOA, 1994 in 2011 and Transplantation of Human Organs (Amendment) Act 2011 was enforced. Some of the new provisions and rules are as follows:

- Tissues have been included along with the Organs.
- Grandchildren, Grandparents are included in near relative definition.
- Provision of Retrieval Centers, Tissue banks and their registration for organs and tissues.
- Swap Donation system introduces.
- There is provision of mandatory for inquiry and inform about organ donation when he/she admitted in ICU after his/her consent then inform Retrieval Centers.
- 'Transplant Coordinator' in all hospitals registered under the Act it's mandatory.
- Act gives Protection to poor and unsecure people from unfair trading organ and higher punishment to trader.
- To be established National Human Organs and Tissues Removal and Storage Network and National Registry for Transplant.
- Separation of corneas has been permitted by a trained technician.
- Act has prohibited of organ donation from mentally challenged persons

As per notification Transplantation of Human Organs and Tissues Rules 2014, Directorate General of Health Services and Government of India is implementing National Organ Transplant Programme for carrying out the activities, manpower training and promotion organ donation from deceased persons.

## **TYPES OF ORGAN DONATION**

In organ donation, a person oath during her/his life and that after death. Specific organs or all from the body can be used for transplantation to needed patients get a new life. Medical invention can advances in transplantation, any can donate organs – even people in their 100s have donated organs in the past.

**I) Living Donation:** when a living person donates an organ or part of an organ for transplantation to another person is called Living Donation. The living donor can be near relative as Mother, Father, Sister, Brother, Spouse Grandparents and grandchildren. It can also other non near relatives such as a good friend, a relative, a neighbor or an in-law.

**II) Deceased Donation:** If living donation is not an option, an organ or part of an organ can be given at the time of the donor's death. This is called deceased donation. Through deceased donation most transplants are done. It is possible when Patient must be in the ICU in hospital and on a ventilator and doctor declared brain dead. It is important to remember, that deceased donation is only possible after all attempts to save the patient's life have been tried, and brain death has been declared.

## Facts about Organ Donation

- Any human being from any age, caste, religion and community can be donate organs and tissues.
- Organ donation not depends upon age and gender. It's based upon organ condition and strict medical rules and regulations. Without checking and permission by doctors donation and transplant not takes place.
- In case of natural death only these organs and tissues such as Skin, bone, valves, cornea and heart can be donated.
- And only in case of 'Brain Death' organs like lungs, intestines, pancreas, heart and liver can be donated.
- Organ (heart, pancreas, liver, kidneys and lungs) transplanted can be only for whose organs are failing and get new life.
- Above age 18 needs to have the agreement of a parent or guardian to be a donor.

## SIGNIFICANCE OF THE STUDY

- I) The study would be through light on the status of organ donation in India.
- II) The study would be help to understand legal aspects of organ donation in India.
- III) The study would be help to further research regarding Organ donation.

## LIMITATIONS OF STUDY

- I) The research is done with the help of secondary data collected and primary data is not collected.
- II) The geographical area of study is only India and in India rate of organ donation is very low.

## Research Methodology

The present study is explanatory and descriptive in nature. It is based on secondary data, collected from various journals, websites, books and online articles.

## CONCLUSION

In this study the researcher has overview a status and legal aspects of organ donation in India. In India huge demand and poor supply of organs and tissues. Orthodox thinking, misunderstanding and lack of awareness about organ donation therefore India has very low donation rate compare to western countries. As per study there is high level of awareness about organ donation is required in India. India is 2<sup>nd</sup> largest country in the population therefore big opportunity for India for progress in organ donation, also in THOA amendment and mandatory rules regulation is require for awareness and promotion. **ONE NATION ONE FAMILY AND ONE DONOR** is needed for India

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## Review of Health Insurance in India

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### ABSTRACT

*Purpose - Healthcare Industry comprises of different sector, health insurance is one among them it was launched in India within the year 1986. with the rapid modification in the technology and awareness among individuals. Health insurance industry has grown rapidly due to liberalization, privatization, Globalization in the economy. There are government as well as private player in the market which offer different variety of health insurance services as per the necessity of clients. The privatization of insurance improves the performance of health insurance industry as 75% of population utilizes private sector for medical care on the other hand medical facilities becoming costlier day by day and it has become out of reach of the poor individual. Health insurance is a significant alternative which needs to be considered by the policy makers and planners and these services structured as such so everybody can manage the cost of it effectively as well being is essential need of each individual.*

*This paper is gives a overview on health insurance, importance, need and various type of health insurance available in India.*

*Design/methodology/approach – It is a conceptually designed paper with secondary data which gives a review of health insurance in India, need of health insurance, various kinds of health insurance. Findings – From secondary sources (published reports, academic papers), it was discovered that health insurance is vital for an individual because it protects from high or unexpected healthcare expenses.*

*Keywords:- Health, Insurance, Healthcare, Cost, Policy*

### 1. INTRODUCTION

Health insurance may be a sort of amount that pays for medical, surgical, and generally dental expenses incurred by the insured. Health insurance will reimburse the insured for expenses incurred from sickness or injury, or pay the care provider directly. Any Individual can lead a happy and peaceful life with their family when they have healthy life. Health insurance helps in maintaining good health without disturbing financial stability. As nowadays health issues are becoming more complex so it is necessary to plan for your health. Various kinds of health insurance policies available in the market which is for individual as well as for family.

Health is most important for an individual. There is a saying also “Health is wealth”. Various types of health insurance policies helps in accessibility and affordability of medical treatment which common man can't afford sometimes. Insurance provides the coverage again high medical expenses it covers whole or some part of the medical expenses.

Health care industry in India is under a phase of progress as development is going on in a fast pace. People in urban area are more health consciousness nowadays and they spend a high amount of money on their health. Today insurance companies are creating awareness in the urban as well as rural areas by conducting awareness campaigns. Through this, people can get to know about the benefits of health insurance. Introduction of private players in the market helps individual to focus on health care plans. Formulating health care plans and policies is very critical work as many factors has to be considered such as demographic factors, social factors, affordability, etc. Current market condition must be considered while formulating and execution of health insurance policies.

A Health insurance policy is an agreement between the insurance agency and the policyholder, wherein the insurer pays for the medical expenses incurred by the life insured. The insurer will either provide a repayment for your medical expenses or ensure you are eligible for cashless treatment for injuries or illnesses covered under the policy at one of the network hospitals. You can also get tax deductions on the premiums paid towards health insurance under Section 80D of the Income Tax Act, 1961. Some of the health insurance companies in India are: Bharti Axa Health Insurance, New India Health Insurance, National Health Insurance, Star Health Insurance, Reliance Health Insurance, Cigna TTK Health Insurance Company Limited, etc.

### 2. LITERATURE REVIEW

Indian healthcare services framework is described by a humongous general wellbeing foundation. In any case, talented assets are missing and accordingly, this foundation lies inconceivably underutilized. About a fourth of the all out patients are pushed beneath the destitution line because of the disastrous effect of the human services expenditure(Prinja ,et.al ,2012).

Medical coverage plans contrast from organization to organization. An examination expresses that essential needs are secured by the sort and nature of the protection conspire. In spite of the fact that the plans are resolved remembering the requirements and needs of the people(Mishra, A., Seshdari, S.R., 2015), in any case, there are a few lacunas in them. It might demonstrate to be extremely valuable in the event that specific modifications are done in the bundles, for example, maximum cutoff of the advantage bundles, limiting the prohibitions and controlling the expenses (Devadasan, et.al,2007) Prabhjot K. Dilawari1, Shyamal Koley (2016) have examined in their examination study the consciousness of the approach holders towards viability of administrations and the contrast among TPA's and medical coverage operators. As indicated by them administrations were still not systematized.

David M Dror (2006) talked about the legends and substances of medical coverage of the poor. According to the creator there are a few fantasies about the poor's readiness to pay for medical coverage yet in all actuality there is a need and the poor can pay 1.3% of their salary. The market is anyway not yet entered. Medical coverage items ought to be network based undertakings and imaginative and inventive designs to empower poor people to be secured. people think picking a medical coverage plan is significant however they might make not exactly ideal medical coverage decisions for reasons, for example, low health insurance proficiency, absence of data or falsehood, data overload, and time imperatives (Farley Short et al., 2002; Frank and Lamiraud, 2009; Hanoch & Rice, 2011; Lako, Rosenau, and Daw, 2011; Sinaiko and Hirth, 2011). Need of information or seeing how to utilize data could prompt a mismatch of protection to needs. Shoppers might be conveying excessively or too little health insurance for their individual and family well being and financial circumstances.

Selvakumar and Piyan (2012) investigated the exhibition of public and private Life insurance organizations in India. Analyst opined that the present market is client driven, and client should be ruler of market. To fulfill clients advancements are occurring with unmistakable highlights to draw in the clients.

### 3. RESEARCH METHODOLOGY

The methodology adopted for this paper is conceptual in which secondary sources are utilized like published reports, articles and research paper. This paper gives an overview of health insurance and its benefits to an individual and how health insurance helps an individual to cover their medical expenses easily.

### 4. FINDING & DISCUSSION

It is a conceptual paper so findings are that health insurance plays an important role in individual as well as family because it helps in coverage of medical expenses which arise because of medical issues or accidental injuries. life insurance was the most popular form of insurance in India. Earlier people didn't have awareness about the benefits of health insurance and related schemes but with the liberalization and technology many companies entered in the market and provided health care solutions and technology helps a lot in spreading awareness about the benefits. Health insurance has been a development in India as it covers some or overall part of medical expenses.

#### 4.1 Benefits of Health Insurance policy

Health should be the first priority for everyone because "Health is wealth". purpose of health insurance is to provide medical coverage against medical expenses, pre and post medical treatment, transportation charges and many more but many people assume that insurance only covers hospital bill but lack of awareness among people about health insurance many benefits are unused. health insurance policies are designed to cover the medical expenses in case of medical emergency. through health insurance one can get access to best health care services. health insurance policies are designed and formulated as per the requirements of individual and family. There are some benefits of health insurance\ Cash less treatment through insurance policy as insurance company works in collaboration with various hospital networks. Patient don't have to worry about medical expenses as all the expenses are paid by third party (insurance company).

- Pre as well as post hospitalization expenses for the period of 30-60 days depend on the insurance policy hold by policy holder.

- If you hold a health insurance policy and don't make any claim for an entire year then the policy holder will be rewarded as no claim bonus and through this policy holder can access to various other benefits during their treatment.
- Health insurance is much more than hospital expenses it covers OPD expenses, ambulance charges, Medical checkups, medicines and many more.
- Policy holder can get tax benefit also as premium paid for health insurance is tax deductible under section 80D of income tax.
- Many individuals are unaware about this that several insurance companies provide maternity cover in this hospital expenses during pregnancy, pre and post delivery expenses , vaccination for new born and many other expenses are covered depend upon the policy .
- There is another and important benefit that policy holder can easily switch their current policy to another insurance provider for better health services.

## 4.2 Need & Importance of Health Insurance

- In today's world everyone is busy in their work life and they even don't have time for their health as there is always probability of unexpected illness which automatically require treatment and these medical expenses can put a big hole in your pocket but with the help of health insurance one can avoid such hassles.
- Health insurance ensures that long term expensive treatment will not bother anyone & their family financially that's why insurance company comes with different kinds of policy which you can opt as per customers need.
- With inflation , the cost of medical treatment is also effected, for quality health care services one should opt health insurance policy for themselves as well as for other family member. for receiving the benefit ,policy holder have to pay premium depending upon the plan they choose.
- As discussed earlier there are different kinds of health insurance policy which provide many benefits and save an individual from wiping out their lifetime saving.

## 4.3 Types of Health Insurance

There are various companies in the market which provide different kinds of Health insurance policy as per the needs and requirement of policy holder. Following are the different types of Health Insurance in India are :

- Individual Health Insurance : This plan is for individual policy holder in this the premium is low as it depend on the plan chosen by individual. This plan is designed for an individual to insure them against illness. It cover the hospital expenses till the cover limit is reached. There are certain factors that contributed to the price of policy such as medical condition, age,etc.
- Family Floater Health Insurance : This plan meant for the entire family. one can cover their family member (upto 15 members) under one plan. In this plan the price is comparatively cheaper then buying individual insurance as the sum insured is equally divided among family members.
- Senior citizen Health Insurance : This plan is designed to cater the needs of senior citizen for the 60 years and above. This plan is provided by few companies only so medical checkup is necessary in this plan , these policies cost is little high because senior citizens are more prone to illness as compared to youngsters.
- Personal Accident Insurance : It covers expenses related to accident ,provide compensation in case of death,disability, impairment cause during accidents. It is important for family security and claim method is very easy in this policy.
- Maternity Health Insurance : This plan is designed to cover women who are expecting child in this policy child delivery expenses ,hospital expenses, vaccinations,etc are covered depend on the plan. Both mother and child are covered under this plan.

- Employee Health Insurance : These type of plan offered by employer and designed to exclude and include employees as they join or leave the organization. such type of policies have low premium and helps in retaining the employees in the organization.
- Joint Health Insurance : This plan is designed for couples in this the insurance policy is shared by 2 insured individuals. In one year , both or one of assured is insured and free to claim the full sum assured.
- Critical Illness Health Insurance : This plan is design to treat certain critical illness as treating these illness might be expensive for middle class family , buying these type of insurance can mitigate those expenses upto some extent.This plan is useful if insured had a history of such illness in the family. some of the illness are covered under this plan are cancer. heart attack ,kidney failure,organ transplant,,etc.

## 4.4 Challenges

Some of the issues and challenges of Health Insurance in India are described below. One of the most important issue is lack of awareness among customers/consumers. Even today mostly people are unaware about health insurance services and it's benefits. There is a major lack of awareness about the benefits of health insurance among the people in rural areas to that of urban areas.mostly in the rural areas people are unaware as compared to urban areas. To deal with this problem, government should conduct special awareness programmes in urban areas. Another major challenge is that some of the distributors are not fully aware about the product and services , which create confusion among buyers. The issue has been resolved to some extent as technology is very vast and people can get various information about the services through the company's website and through this they can get clarity. Claim processing is another important challenge because most of the time insurance companies does delay in giving claim to policy holders which leads to negative perception about insurance companies in consumer's mind. The price is most important challenge and one of the reasons of low health penetration in country as there are lot of consumers specially in rural areas who cannot afford expensive insurance. The private sector along with the government should try and make the affordable insurance plan so that everyone can avail it's benefits.

## 5. CONCLUSION

Health insurance is important for an individual as well as for the family as it protects one from high medical expenses .India is a growing economy and health insurance companies will develop Indian economy rapidly in the coming years. There are private and government players players in the market which provide different kinds of insurance policies. It gives benefit to the customer as they can get quality treatment by paying small amount of premium. Health insurance has several benefit which helps an individual to save their lifetime earnings.Although this paper gives a review to health insurance in India and it concludes that in this era, health insurance is important for every individual. It's like a small investment one can make to save oneself from paying lakhs to hospital in future.

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## Public Health in India: Role of Government, Current Scenario, Implications and Future Scenario

### ABSTRACT

*In India, there is an urgent need for stimulating primary health care in order to meet the challenges of epidemiological transition, demographical transition and social determinants of health and it is the new agenda for Public Health in India. The role of the government in affecting population health is spread across various sectors and is not limited within the health sector. This research paper is based on secondary sources and is a literature review of the existing government mechanism for public health needs in India and its future scope. Health sector includes various vital areas such as health system strengthening; human resource development and capacity building and regulation in public health. Various social factors such as living conditions, nutrition, safe drinking water, sanitation, education, early child development and social security measures also contribute to health of population. It is very challenging to make public health a shared value across various sectors, but at the same time such collective action is very important.*

**Keywords:** Public health, health sector, role of government, current scenario of public health

### INTRODUCTION

India has witnessed numerous hurdles in its attempt to affect lives of the people of this country, thus the practice of public health has been dynamic in nature. Post independence, major public health problems such as malaria, tuberculosis, leprosy, high child mortality rate and human immunodeficiency virus (HIV) have been addressed through a rigorous action of the government. Social development along with scientific advances and health care has led to a decrease in the mortality rates and birth rates.[1]

This research paper is based on secondary sources and is a literature review of the existing government mechanism for public health needs in India and its future scope.

### IMPLICATIONS IN PUBLIC HEALTH

Epidemiological transition (rising burden of chronic non-communicable diseases), demographic transition (increasing elderly population) and environmental changes are a part of new agenda of Public Health. However, the unfinished agenda of maternal and child mortality, HIV/AIDS pandemic and other communicable diseases still sway on the overburdened health systems.

**Silent epidemics:** Tobacco related diseases kill over one million people in India annually and is the fourth leading cause of non-communicable diseases (NCD) such as cancer and heart diseases, which account for 53 per cent of all deaths in India as on 31<sup>st</sup> May, 2019. which leads to huge social and economic losses, in addition to which mental, neurological and substance use disorders also cause a large burden of disease and disability. The rising number of road deaths and injuries (As many as 1.47 lakh people died on Indian roads in 4.64 lakh accidents reported during 2017, as per the report by Ministry of Road Transport and Highways.) implies it to be next in the record of silent epidemics. These depressing figures resemble human suffering.

### ROLE OF GOVERNMENT IN HEALTH SECTOR

It is the responsibility of the government to improve the infrastructural resources which includes the availability of water, electrical grid, telecommunication, road etc. The central government allocates budget to State Government for these functions.

The Planning Commission of India among its various functions formulates a plan for the most effective and balanced utilization of the country's resources. Every state has its own State Planning Commission. The State Planning Commission, in addition to other functions, is primarily responsible for giving necessary support to all the Urban Local Bodies.

Under the National Health Mission, the government has launched several schemes like:

1. Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) programme essentially looks to address the major causes of mortality among women and children as well as the delays in accessing and utilizing health care and services. It also introduces new initiatives like the use of Score Card to track health performance, National Iron + Initiative to address the issue of anemia across all age groups and the

Comprehensive Screening and Early interventions for defects at birth, diseases, and deficiencies among children and adolescents.

2. Rashtriya Bal Swasthya Karyakram (RBSK) is an important initiative aiming at early identification and early intervention for children from birth to 18 years to cover 4 'D's viz. Defects at birth, Deficiencies, Diseases, Development delays including disability. Early detection and management diseases including deficiencies bring added value in preventing these conditions to progress to its more severe and debilitating form

### 3 The Rashtriya Kishor Swasthya Karyakram

The key principle of this programme is adolescent participation and leadership, Equity and inclusion, Gender Equity and strategic partnerships with other sectors and stakeholders. The programme enables all adolescents in India to realize their full potential by making informed and responsible decisions related to their health and well-being and by accessing the services and support they need to do so.

4. The government of India has launched Janani Shishu Suraksha Karyakaram to motivate those who still choose to deliver at their homes to opt for institutional deliveries. It is an initiative with a hope that states would come forward and ensure that benefits under JSSK would reach every needy pregnant woman coming to government institutional facility.

Since the rate of deaths in the country because of communicable and non-communicable diseases is increasing at an alarming rate, the government has introduced various programmes to aid people against these diseases.

In India, approximately about 5.8 million people die because of Diabetes, heart attack, cancer etc each year. In other words, out of every 4 Indians, 1 has a risk of dying because of a Non- Communicable disease before the age of 70.

**According to the World Health Organisation, 1.7 million Indian deaths are caused by heart diseases.**

5. National AIDS Control Organisation was set up so that every person living with HIV has access to quality care and is treated with dignity. By fostering close collaboration with NGOs, women's self-help groups, faith-based organizations, positive people's networks, and communities, NACO hopes to improve access and accountability of the services. It stands committed to building an enabling environment wherein those infected and affected by HIV play a central role in all responses to the epidemic – at state, district and grassroots level.

6. Revised National TB Control Programme is a state-run tuberculosis control initiative of Government of India with a vision of achieving a TB free India. The program provides, various free of cost, quality tuberculosis diagnosis and treatment services across the country through the government health system.

7. National Leprosy Eradication Programme was initiated by the government for Early detection through active surveillance by the trained health workers and to provide Appropriate medical rehabilitation and leprosy ulcer care services.

8. The Government of India has launched Mission Indradhanush with the aim of improving coverage of immunization in the country. It aims to achieve at least 90 percent immunization coverage by December 2018 which will cover unvaccinated and partially vaccinated children in rural and urban areas of India.

9. In order to address the huge burden of mental disorders and the shortage of qualified professionals in the field of mental health, Government of India has implemented National Mental Health Program to ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future.

10. Pulse Polio is an immunization campaign established by the government of India to eliminate polio in India by vaccinating all children under the age of five years against the polio virus.

11. The Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) was announced with objectives of correcting regional imbalances in the availability of affordable/ reliable tertiary healthcare services and also to augment facilities for quality medical education in the country by setting up of various institutions like AIIMS and upgrading government medical college institutions.

12. Since there are huge income disparities, therefore, the government has launched several programmes in order to support the financially backward class of the country. As about 3.2 crore people in India fall under the National Poverty line by spending on healthcare from their own pockets in a single year. The most important programme launched by the government is Rashtriya Arogya Nidhi which provides financial assistance to the

patients that are below poverty line and are suffering from life-threatening diseases, to receive medical treatment at any government run super specialty hospital/ institution.

13. National Tobacco Control Programme was launched with the objective to bring about greater awareness about the harmful effects of tobacco use and about the Tobacco Control Laws and to facilitate the effective implementation of the Tobacco Control Laws.

14. Integrated Child Development Service was launched to improve the nutrition and health status of children in the age group of 0-6 years, lay the foundation for proper psychological, physical and social development of the child, effective coordination and implementation of policy among the various departments and to enhance the capability of the mother to look after the normal health and nutrition needs through proper nutrition and health education.

15. Rashtriya Swasthya Bima Yojana is a government-run health insurance programme for the Indian poor. It aims to provide health insurance coverage to the unrecognized sector workers belonging to the below poverty line and their family members shall be beneficiaries under this scheme.

## **BETTERMENT OF HEALTH CARE SYSTEM**

Four criteria could be suggested- First universal access, and access to an adequate level, and access without excessive burden. Second fair distribution of financial costs for access and fair distribution of burden in rationing care and capacity and a constant search for improvement to a more just system. Third, providing training for competence empathy and accountability, pursuit of quality care and cost effective use of the results of relevant research. Last, special attention required to vulnerable groups such as children, women, disabled and the aged.

## **FUTURE OF HEALTH CARE SYSTEM IN INDIA:**

By 2050, India's population is expected to reach 1.7 billion people, creating the most populated country in the world. Growth of the Indian population and transition of its demography will need for leapfrogging in healthcare delivery including transformation of public healthcare system. Major shifts await healthcare industry in India.

### **What lies ahead?**

India's demographic and epidemiology profile will witness a change by 2050 which will demand healthcare sector needs to evolve. India's population is projected to be 1.7 billion in 2050 with maximum number of people in the working age group of 15 to 64 years and average life expectancy at 80+ years. The old age population is expected to grow to 14% (from 4% at present) with geriatric health care specialized services such as dementia, nutritional services and home care services expected to have a larger role. The shift in demographic patterns and lifestyle trends will necessitate preventive healthcare to reduce cost of healthcare spend. Moreover nearly 51% of India's population is expected to live in cities by 2050 (up from 30% in 2015). Increased urbanization may offer some advantages to the health care practitioners such as a larger set of population will be accessible for availing healthcare services at relative lower costs.

### **Trends shaping future health**

India is leapfrogging the use of technology innovations such as mobile health devices, technology integration with healthcare data and telemedicine strategies which could reduce the burden from health system while still trying to boost healthier lives, reducing disabilities and increasing life expectancy. This trend will continue to evolve as there will be a shift in population profiles, disease burden and care protocols by 2050 and a future will emerge where chronic diseases are things of the past, patient dependency on public healthcare systems is minimal and more preventive care is sought for, life threatening diseases such as TB, Cancer or AIDS are cured and people lead healthy lives post treatment.

Significant investment in research and development activities both from Indian government and private sector will propel innovations in drugs or improve medical devices. A strong digital infrastructure with IoT integration across personal devices, hospital and public healthcare databases will help spur efficient growth. Healthcare Big-Data will be available as public healthcare systems in India will be digitized and patient data standardized and interoperable. A wide range of medical and healthcare functions, including clinical diagnosis, decision support, disease surveillance, and population health management would be possible through predictive analysis facilitating better preparedness for addressing onset of disease burden.

## Healthcare Pillars for India in 2050

The core healthcare pillars in India will transition to a care delivery model which is more personalized and focused on preventive and predictive healthcare rather than the reactive and curative care at present. Health system has started to witness these changes and the future medical technology is immanent with hope. We are witnessing advancement of emerging technologies like brain-computer interfaces, nano robots, gene manipulation, robotic surgery, synthetic organs, organ cloning, individualized drugs, bionic body parts across the developed world. Many of these technology innovations are here to stay and will be adapted in India in near future. A more equitable healthcare care delivery system will be established making it faster, cheaper and better for all income levels to access these services.

## Devices transformation

Explosive growth in mobile devices and rising internet penetration will drive transformation and the healthcare sector will be reap the benefits of a digitally connected India; In 2050 we can expect to see a future of connected devices, wearable both invasive and noninvasive sensors like biomarkers, electronic tattoos, bluetooth-enabled implants, and other sensors that track our vital signs, organ health monitoring that will change the modes of how and when the care is received. These advancements coupled Big Data analytics and AI will improve health and life experiences as part of a Human Operating System (Human OS) a platform for innovation.

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## A Study of the Perception & Awareness Towards Organ Donation from the Point of View of Individual and Religious Aspect”

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### **ABSTRACT**

*India is the world's second-most populous country. But surprisingly & sadly it has a pitiable deceased organ donation rate of just 0.26 per million population compared to 26 in the US, 35 in Spain and 36.5 in Croatia.*

*Organ Donation is saving a donor's organs like heart, liver, kidneys, intestines, lungs, and pancreas, during the lifetime or even after the donor dies, for the purpose of transplanting them into another person who is in need of an organ.*

*According to Medical information all people are eligible to be potential organ and tissue donors-regardless of age, health, race, or ethnicity. Every adult can be a proud Organ donor irrespective of his age, whether alive, brain dead or even dead. The statistics shows India in a very poor light as regards organ donation with many issues & challenges being the reason & excuse.*

*The purpose of this Research Paper is to study the perception & awareness towards organ donation from the point of view of an individual and the religion. A sample size of 102 for primary data & use of secondary data is also made for this research. A pragmatic & holistic approach towards promoting and creating awareness regarding organ donation is the need of the day which needs serious consideration & implementation.*

**Keywords:** *Organ donation, Religion, perception, issues & challenges*

### **1. INTRODUCTION**

**Organ donation** is the process when a person allows an organ of their own to be removed and transplanted to another person, legally, either by consent while the donor is alive or dead with the assent of the relatives & immediate family.

Organ Donation can be made for saving other person's life who is in need of an organ, research or, more commonly, healthy transplantable organs and tissues may be donated to be transplanted into another person who are awaiting transplantation.

Common transplantations include kidneys, heart, liver, pancreas, intestines, lungs, bones, bone marrow, skin, and corneas. Some organs and tissues can be donated by donors even in their life time, such as a kidney or part of the liver, part of the pancreas, part of the lungs or part of the intestines, but most donations occur after the donor has died with his consent during his lifetime or with the permission of his immediate family on his death.

In the recent years while views of organ donation are optimistic, there is an enormous gap between the numbers of registered donors compared to those awaiting organ donations on a global level.

#### **Statistics regarding Organ Donation in India –**

India is struggling with an acute shortage of organs for transplantation.

It is estimated that more than a million people suffer from end-stage organ failure, but **only a handful of 3,500 transplants are performed annually.**

At least 15 patients die every day waiting for organs and every 10 minutes a new name is added to this waiting list. Undoubtedly, **the demand far outstrips the availability of organs.** And no one can escape the harsh reality.

According to a survey, **every year in India**, about:

- 500,000 people die because they do not have access of organs
- 200,000 people die due to liver diseases which can be prevented through liver donation

- 50,000 people die because of heart disease.
- Moreover, 150,000 people await a kidney transplant. The statistics show that only 5,000 get kidneys through organ donation.

There appears to be a lot of confusion and myths embedded in the minds of the people regarding organ donation in their respective religions. For the purpose of this research interviews with various people from the religions in India clarified the basic myth that nearly all the religions in India support and in fact appreciate organ donation as the biggest human service to mankind.

### **Legality of organ donation in India:**

India has a fairly well developed corneal donation program; however, donation after brain death has been relatively slow to take off. Most of the transplants done in India are living related or unrelated transplants.

### **Organ selling is legally banned in Asia.**

The legislation called the Transplantation of Human Organ Act (THO) was passed in India in 1994 to streamline organ donation and transplantation activities. Broadly, the act accepted brain death as a form of death and made the sale of organs a punishable offence.

On July 30, 2008, the Government brought in a few new amendments as a Gazette with the purpose of putting a stop to organ commerce from the point of view of illegal sale of organ from a commercial point of view which is illegal as well as unethical. The ethics of commerce in organ donation and transplant tourism has been widely criticized by international bodies.

Government, private hospitals, NGOs and the State Health department are trying to do their best for promoting organ donation. Just like the literacy programs, most of the deceased donation programmes have been developed in southern states of India.

Some of the programmes being implemented to name a few are as follows-

- Andhra Pradesh - Jeevandan programme
- Karnataka – Zonal Coordination Committee of Karnataka for Transplantation
- Kerala – Mrithasanjeevani – The Kerala Network for Organ Sharing
- Maharashtra – Zonal Transplant Coordination Center in Mumbai
- Rajasthan – Navjeevan – The Rajasthan Network of Organ Sharing
- Tamil Nadu – Cadaver Transplant Programme

### **Religious perception regarding Organ Donation**

#### **1. Hinduism**

Hinduism & Hindu traditions support the use of body parts to benefit others. From Hindu point of view organ donation is a spiritually valuable deed for the donor, provided that the decision is made with the knowledge and agreement of not only the donor but also those close to the donor.

No religious law prohibits **Hindus** from **donating** their **organs** and tissues. Life after death is a strong belief of **Hindus** and is an ongoing process of rebirth. This could be seen as reflecting positively on the concept of **organ donation and transplantation**.

#### **2. Buddhism**

There are no rules in Buddhism for or against **organ donation**, but central to Buddhism is a wish to relieve suffering. There may also be occasions when **organ donation** may be seen as an act of charity.

#### **3. Sikhism**

Seva **can** also be about **donating** your **organ** to another - **Sikhism does** not attach taboos to **organ donation** and transplantation and stresses that saving a human life is one of the noblest things you **can do**. **Sikhs** also believe that your body **does** not need all its **organs** at or after death.

#### **4. Catholicism**

Roman **Catholics** view **organ** and tissue **donation** as an act of charity and love, as reported in the **Catholic** Publication Origins in 1994. Transplants are morally and ethically acceptable to the Vatican.

## 5. Jainism

In Jainism, compassion and charity are considered two major virtues. Organ donation has been widely supported by the Jain community leaders and monks. A leading Jain sadhvi and several important Jain community leaders in Pune have questioned the widespread opposition to organ donation in the Jain community and have openly supported this life-saving medical practice, including cadaveric transplants.

## 6. Islam

The majority of Islamic **religious** leaders accept **organ donation** during life (provided it does not harm the donor) and after death in order to save life.

**Every year, August 13 is celebrated as Organ Donation Day. All people should consider themselves potential organ and tissue donors-regardless of age, health, race, or ethnicity.**

Awareness of organ donation is, therefore, the only way out of this depressing scenario. The more potential donors there are, the more the likelihood of organs becoming available to save lives.

Along with the Interviews a survey by way of Questionnaire was conducted wherein responses were collected from a sample size of 102 Respondents.

### Reasons for poor response to organ donation

- Individual hesitance
- Lack of Family Consent.
- Lack of family permission in case of Brain dead person as they have a false hope of miracle.
- Superstitions, myths & Misconceptions
- Lack of Education, Awareness & promotion of organ donation
- Lack of quick action on death by family as well as authorities for transfer of the organ to retrieval centres
- Lack of Organ Transplant infrastructure

## 2. SIGNIFICANCE OF THE STUDY

In the recent years while views of organ donation are optimistic, there is an enormous gap between the numbers of registered donors compared to those awaiting organ donations on a global level. There are various myths connected with Organ donation and perceptions of individuals towards organ donation which is the major challenge. So also there is lack of awareness regarding organ donation. This research paper tries to bring forth the issues & challenges of organ donation and some suggestions for their promotion and creation so as to increase the percentage of organ donation in India.

## 3. OBJECTIVES

- (1) To understand the concept of organ donation
- (2) To understand the issues & problems faced for organ donation
- (3) To analyze the awareness of organ donation in India
- (4) To provide suggestions for effectiveness of organ donation in India.

## 4. RESEARCH METHODOLOGY:

### Research Design

**(1) Explanatory & Descriptive Research:** The current research is explanatory & descriptive in nature.

### (2) Data Collection:

**Survey method & Interview method is used to collect data from the respondents through questionnaire.**

### Google form was created

Secondary data is collected through books, journals and web sites.

### (3) Sample

**Convenient sampling technique was to be adopted to collect the sample size of 102 respondents.**

The respondents belonged to different age groups, gender & religion.

## 5. SUMMARY OF FINDINGS & INTERPRETATIONS

It is alarming to note that out of 102 Respondents, 70 were not aware of the procedure of Organ donation in India, 90 Respondents were not aware of the laws relating to organ donation in India, 75 Respondents are of the opinion that enough information regarding Organ donation is not available in India.

- a. 99 of the Respondents knew the meaning of Organ Donation
- b. The source of information regarding Organ donation through Promos & Advertisement was only 16. The source of information from Family/Friends -33 & from Internet 30 Respondents came to know.
- c. A positive outcome of the survey was that 88 were of the view that the purpose of Organ donation is saving someone's life.
- d. 72 of the Respondents were sure that their Religion allows organ donation. There was a mixed reaction from 28 who were not sure whether their Religion allows or not. (Respondents were Hindus, Muslims, Sikhs, Jains, Buddhist & Christians)
- e. One of the reason for hesitation towards organ donation was the fear of Misuse of the organs donated. (26 thought they could be misused & 45 were not very sure)
- f. Out of the 102 Respondents 87 were ready to donate to anyone who was in need of the same.
- g. As regards the time of consent, 61 were of the opinion that the consent should be given when living by the individual himself, & 36 were of the opinion that the family should give consent after the death of the family member.
- h. Nearly 70 were not aware of the procedure of organ donation in India.
- i. As regards the initiative for registering for Organ donation 64 were sure that they would register & 30 were in a mixed state of mind.
- j. As regards the agreement from the family members 59 were sure that their family would agree to their decision of organ donation. 37 Respondents were of the opinion that they are not sure about the reaction of their families.
- k. An alarming finding regarding information regarding organ donation in India was minimal. 51 responded that there is no information & 24 were not very sure about organ donation information.
- l. 52 were ready to act as Ambassadors for promoting organ donation in India & 34 would consider being Ambassadors.
- m. 90 of the Respondents were not aware about various laws governing organ donation in India.
- n. There was mixed reaction were there was nearly equal opinion regarding making organ donation compulsory in India and India being a better & healthy country to live with more contribution towards organ donation.

## 6. CONCLUSION

Knowledge, sociocultural views, and awareness about organ donation in the general population are important for the success of deceased organ donation.

The THO act despite having been passed 25 years ago has neither curbed trade in organs nor helped promotion of the deceased donation program to take care of the organ shortage. The gap between the numbers of organs available and the number of patients joining the waiting list for an organ transplant is widening globally and the waiting list seems to be never ending. There is an ardent need to take a holistic approach. All the religions strongly support the cause of organ donation and it is considered to be the highest form of sacrifice.

The need of the day is creating awareness and promoting organ donation on a war front. The social cause should be taken ahead by the Legislature, Government, NGO's, Religious Head as well as each & every individual through mutual cooperation, coordination & pro activeness. The myths surrounding organ donation should be clarified & its relevance to be promoted.

## 7. RECOMMENDATIONS/SUGGESTIONS

From the findings the following are the main issues that have to be streamlined with 360-degree approach by the Individuals, NGO's, Religious Leaders, Hospitals & the Government

- 1) Promoting the laws relating to organ donation
- 2) Focus on creating awareness regarding organ donation
- 3) Creating an Infrastructure for smooth organ transplants
- 4) Ensuring safety of organ donated
- 5) Clarification of various myths linked to organ donations
- 6) Adopting Zero tolerance policy in respect of illegal organ transplants
- 7) Concentrating on promoting an effective communication system regarding awareness & significance of organ donation
- 8) Creating an atmosphere where we encourage organ donors to speak up
- 9) Appreciating & felicitating Organ donors & their families
- 10) Policies for rewarding Organ Donors-Financial & Non-Financial incentives.
- 11) Code of ethics in respect of Organ donation practices & procedures.

A holistic & pragmatic view - "**Live life after death - pledge to donate your organs.**"

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## Millennial Indian Shopper's Preference and Perception of Herbal Health Care Products – An Empirical Study

### ABSTRACT

The study is to examine the millennial Indian shopper's preference and perception of herbal healthcare products. In that way the researcher analysis the usage pattern of the herbal health care products, and the factors influencing to purchase herbal health care products. Problems in purchase of herbal health care products. 200 samples were collected from respondents, through Well-structured Questionnaire. Percentage analysis, one sample t-test, ranking analysis and one way ANOVA was performed. The study concluded that the herbal health care products healthcare product companies to work on improving their product features and quality.

### INTRODUCTION

Contemporary medicine can be broadly classified as allopathy and alternative forms of medicine. Alternative forms of medicine include indigenous medicine systems such as Ayurveda, Yoga and Naturopathy, Homeopathy, Siddha and Unani. These medicine systems mostly focus not just on the disease or ailment, but on the patient as a whole taking into consideration aspects such as age, habits, physical condition, diet and overall well-being of the patient. Some systems such as Yoga and Naturopathy do not involve medicines, rather through diet, exercise, massage, living habits and other non-intrusive ways of improving the patients' health, curing them and ensuring their continued well-being. In India, Ayurveda, Yoga and Naturopathy and Siddha were practiced in ancient times. Homeopathy also found its way into India more than a century ago, however, during the last 50 years or so, we have started relying heavily on allopathy for all ailments starting from the common cold to potentially fatal diseases such as cancer.

During the last decade, an increase in awareness of the side-effects of allopathy, coupled with the proliferation of social media which spreads information to millions of people in a matter of few hours, has led to Indian folks, especially millennials to resort to alternative forms of medicine, especially herbal based ones. Ayurveda and Siddha forms of medicine involve use of herbal medicines and products for curing ailments. The same analogy also applies to healthcare products for external use also for ailments such as pimples, acne, arthritis, as well as for skincare, beauty and cosmetics.

A WHO (World Health Organization) research estimates that around 80 percent of world population relies mainly on natural medicines rather than on contemporary medicinal products because of adverse reactions and elevated costs of contemporary medicinal goods (Sharma, Shanker, Tyagi, Singh & Rao, 2008).

### Millennials, Who are they?

This generation is the group of consumers and inhabitants of the world who have been labeled as the Generation Y, Millennials, and Echo Boomers. In fact, Valentine & Powers (2013) suggest several ways to name to this generational group: millennials, don't label us generation, generation tech, generation next, generation.com, generation 2000, echo boom, boom babies, Generation XX.

**Table-1: Millennials birth period**

No	Author/year	Millennials (birth period)
1	Valentine & Powers(2013)	1977 - 1996
2	Muda, Mohd, & Hassan (2016)	1980's to the early 1990's
3	Omar (2016)	1980-1990's
4	Lissitsa & Kol (2016)	1980-1999
5	Moore (2012)	1982-2000
6	Rainer & Rainer (2011)	1980-2000
7	Lee & Kotler (2016)	1980-2000
8	Junker, Walcher, & Blazek (2016)	1981-1995
9	Orduń (2015)	1981-2000
10	Howe & Strauss (2000)	1982-1988

Source: URL: <http://doi.org/10.5539/ijms.v9n5p135>

## REVIEW OF LITERATURE

Insight is a process by which individuals organize and understand their sensory impressions to give meaning to their environment (Robbins & Judge, 2013). Kurtz and Boone, (2006) different people have different observations of items or events based on the connections of two types of factors that are stimulus factors and individual factors. (Khan & Khan, 2013) The non-appearance of side effect is the most essential factor that influence women in the purchase of health care products. Awad & Al-Shaye (2014) in their study describe the level of awareness, pattern of usage and attitudes towards herbal health care products. The attribute respondent associates with herbal products were to promote and maintain health an prevenillness and build the immune system.

## OBJECTIVES OF THE STUDY

- To study the demographic profile of the millennial shoppers.
- To know the Usage Pattern of the Herbal Health care Product.
- To analysis the factors influencing to purchase herbal health care products.
- To identify the Problems in Purchase of Herbal Health Care Product.
- To observe the factors of Perception towards Herbal Health Care Products.
- To determine Information required related to Herbal Health Care Products and Innovativeness in buying Herbal Health Care Products.

## HYPOTHESES

- Factors of Perception towards Herbal Health Care Products do not differ significantly.
- Factors of Information required related to Herbal Health Care Products and Innovativeness in buying Herbal Health Care Products do no differ significantly.
- There is no significant influence between Academic qualification of the shoppers on Factors of Perception towards Herbal health care products,
- There is no significant influence between Academic qualification of the shoppers on Information required related to herbal Health care products and Innovativeness in buying Herbal Health care Products

**Table – 2: Research Methodology**

S.No	Title	Methodology
1	<b>Area of the study</b>	Chennai City
2	<b>Sample Size</b>	100
3	<b>Sampling technique</b>	Simple random sampling
4	<b>Sources of Data</b>	<b>Primary Data</b> – Survey method <b>Secondary data</b> - journals, magazines, books, articles, research papers and websites
5	<b>Research Tools</b>	Percentage analysis, T-test, ranking analysis, Factor Analysis and ANOVA
6	<b>Data Instrument</b>	Well-structured Questionnaire
7	<b>Reliability Test</b>	Cronbach's alpha .853 (85.3%)

## • LIMITATIONS

The Research Area was confined to Chennai Only. Sample size was only 100. Respondent's opinion differs from time to time

## ANALYSIS AND RESULTS

**Table – 3: Demographic Profiles**

S.no	Demographic variables	Frequency	Percentage
1	Gender	Male	35
		Female	65
		Total	100
2	Age	20-25	37

		25-30	30	30
		30-35	20	20
		35-40	13	13
		Total	100	100
3	Academic Qualification	school level	18	18
		Diploma	20	20
		<b>Graduate</b>	<b>27</b>	<b>27</b>
		Post graduate	22	22
		Total	100	100
4	Occupation	Professional	16	16
		Government employee	20	20
		Business	18	18
		<b>MNC &amp; other Private Sector</b>	<b>26</b>	<b>26</b>
		House Wife	<b>20</b>	<b>20</b>
		Total	100	100
5	Marital status	<b>Married</b>	<b>64</b>	<b>64</b>
		Un married	36	36
		Total	100	100
6	Income	below 20,000	22	22
		20,000 - 40,000	28	28
		<b>40,000 - 60,000</b>	<b>30</b>	<b>30</b>
		Above 60,000	20	20
		Total	100	100

The above table reveals that, the maximum of, 65% of the respondents are females, 37% majority of the surveyed population falls under the age group of 20-25 years, 27% Millennial Indian Shoppers are Graduates; 26% of them are working in MNC & other private sector and 64% of the Herbal health care product users are married and 30% are earn their monthly salary of Rs. 40,000 to Rs. 60,000.

Table – 4: Usage Pattern of the Health care Product

S.no	Variable of Herbal Health Care Products	Frequency	Percent age
7	Spending pattern on Heath Care product (monthly)	Less than 500	18
		500 -1000	20
		1000-1500	19
		<b>1500 -2000</b>	<b>28</b>
		Above 2000	15
		Total	<b>100</b>
8	Factors affecting Trustworthiness of Herbal Health Care Brands	Product Origin	17
		Awards Received	14
		Laboratory Reports	12
		Editorial	22
		<b>Recommendation from friends and family members</b>	<b>23</b>
		Total	<b>100</b>
			<b>100</b>
9	Source of information about Herbal Health care products	<b>Internet</b>	<b>30</b>
		Seminar	10
		Newspaper	17
		Samples	14
		Leaflets	8
		Word of mouth	21

		Total	100	100
10	<b>Herbal Health Care awareness and its Sources</b>	Discount	17	17
		Latest product	13	13
		<b>Product reviews</b>	<b>42</b>	<b>42</b>
		Beauty	28	28
		<b>Total</b>	<b>100</b>	<b>100</b>
11	<b>Herbal Health care Brand Consciousness of shoppers</b>	<b>Yes</b>	<b>78</b>	<b>78</b>
		No	22	22
		<b>Total</b>	<b>100</b>	<b>100</b>
12	<b>Shopping habits of Herbal Health Care Products</b>	<b>Shopping Malls</b>	<b>36</b>	<b>36</b>
		Supermarkets	20	20
		Traditional shops	18	18
		E-Shopping	26	26
		<b>Total</b>	<b>100</b>	<b>100</b>
13	<b>Factors Affecting for the Herbal Health care product buying decision of shoppers</b>	Company	10	10
		Packaging	15	15
		<b>Brand name</b>	<b>40</b>	<b>40</b>
		Price	35	35
		<b>Total</b>	<b>100</b>	<b>100</b>
14	<b>Types of Herbal Health Care Products</b>	Face care	12	12
		Body care	30	30
		Hair care	20	20
		<b>General Health care</b>	<b>38</b>	<b>38</b>
		<b>Total</b>	<b>100</b>	<b>100</b>

It is evident that 22% of the millennial shoppers spend Rs.1500 to 2000 per month for herbal health care products. 23% of the shoppers revealed that Friends and family member's recommendations were the main source for the trustworthiness of the herbal health care products. 30% of the Respondents have their knowledge about the products from Internet. 42% of the shoppers have received awareness from product reviews. 78% of the surveyed population are brand conscious shoppers. 36% of the respondents are purchased herbal health care products from Shopping Malls. 40% of them gave importance to Band Name. 38% of the respondents purchase General Health care products.

## RANK THE FOLLOWING STATEMENTS

The following table reveals the ranked mean values and the level of significance on the basis of One Sample t-test.

**TABLE – 5 RANKING MEAN VALUES AND ONE SAMPLE T-TEST - FACTORS INFLUENCING TO PURCHASE HERBAL HEALTH CARE PRODUCTS**

Factors	N	Mean	Standard Deviation	Standard Error Mean	t-value	Rank
Low price	100	3.4903	1.14581	.07120	20.933	3
package	100	3.8533	1.08981	.06772	12.601	8
Nature	100	3.5676	.68076	.04230	37.058	1
Long freshness	100	3.4633	.84999	.05282	27.706	4
Fragrance	100	3.5637	.75148	.04669	33.488	2
Quality	100	3.4633	.82218	.05109	28.643	4
Brightness	100	3.1081	1.01342	.06297	17.597	6
Advertisement	100	2.3900	.93513	.05811	6.711	10
No side effect	100	3.0309	.87105	.05412	19.047	7
Attractive	100	2.6178	.81924	.05091	12.136	9

From the above table, it can be seen that the mean values range from 3.5676 to 2.3900 with the respective standard Deviation 1.14581, 1.08981, .68076, .84999, .75148, .82218, 1.01342, .93513, .87105, .81924. The

ranking analysis is applied on these mean values and found that the **Factors of Influencing to Purchase Herbal Health Care Products**, Nature got first rank with 3.5676 mean values, Fragrance ranked second, Low price, Long freshness got rank 3 and rank 4 respectively. One sample t-test found the t- values (20.933, 12.601, 37.058, 27.706, 33.488, 28.643, 17.597, 6.711, 19.047, and 12.136) are statistically significant at 5% level.

**TABLE – 6: RANKING MEAN VALUES AND ONE SAMPLE T-TEST- PROBLEMS IN PURCHASE OF HERBAL HEALTH CARE PRODUCT**

Factors	N	Mean	Standard Deviation	Standard Error Mean	t-value	Rank
Non-availability of products	100	5.0000	.00000	.00000	-	1
Irritation	100	3.8398	.36747	.02297	80.109	2
Hair loss	100	3.8164	.44445	.02778	65.390	6
Allergy	100	3.8320	.43285	.02705	67.719	3
High price	100	3.8125	.45590	.02849	63.611	7
Low quality	100	3.8359	.42982	.02686	68.343	4
Rashes	100	3.8164	.44445	.02778	65.390	6
Pimples	100	3.8242	.43876	.02742	66.523	5

From the above table, it can be seen that the mean values range from 5.0000 to 3.8125 with the respective standard Deviation .00000, .36747, .44445, .43285, .45590, .42982, .44445, .43876. The ranking analysis is applied on these mean values and found that the **Problems in Purchase of Herbal Health Care Product**, Non-availability of products placed in first position, Irritation got second rank and 3<sup>rd</sup> and 4<sup>th</sup> rank placed by Allergy, Low quality respectively. One sample t-test found the t- values (80.109, 65.390, 67.719, 63.611, 68.343, 65.390, and 66.523) are statistically significant at 5% level.

## FACTOR ANALYSIS

Factor Analysis aims at grouping the original input variables into factors which underlie the input variables. Each factor will account for one or more input variables. Theoretically, the total number of factors in the Factor analysis is equal to the number of factors in the study can be reduced by dropping the insignificant factors based on certain criterion. Here, the results of Factor analysis carried out on the variables of **Perception towards Herbal health care products, Information required related to herbal Health care products and Innovativeness in buying Herbal Health care Products**.

The KMO measures the sampling adequacy (which determines if the responses given with the sample are adequate or not), which should be close than 0.5 for a satisfactory factor analysis to proceed. Kaiser (1974) recommended 0.5 ( Value for KMO) as minimum, values between 0.7 – 0.8 as acceptable, and values above 0.9 as outstanding, in this study to test the sampling adequacy, the KMO test was carried out and its value is satisfactory.

### *Factors of Perception of shoppers towards Herbal health care products (KMO - 0.72)*

The variable loadings for the **First Factor** Consist of Herbal products can be used to help maintain and promote health (.905), Herbal products can be used to treat illness (.851), I think that Herbal products are safe because they are made from natural ingredients (.830) Here, this factor can be labelled as “**Shoppers Suitability**”. This variable loading for the **Second Factor** consist of, If a Herbal products is for sale to the public, I am confident that it is safe(.968), I think that a lot of the health claims made by the manufacturers of Herbal are unproven (.967), Government should regulate the claims made by the manufacturers of Herbal products (.956) This factor can be coined as “**Legalized shoppers** ”. The **Third factor** consist of I think that it is important to talk to a medical doctor before using Herbal products (.937), I think that Herbal products are better for me (.923) This factor called as “**Confused shoppers**”

### *Factors of Information required by shoppers related to Herbal Health Care Products (KMO - 0.82)*

The variable loadings for the **First Factor** contain, there is not enough information on Herbal labels to help me understand the Products (.838), I don't trust the information on the labels of Herbal products (.810), I need more information on Herbal Health care products (.805). Therefore, this factor can be named as “**Preventive shoppers**”. The variable loading for the **Second Factor** contain, Consumers have enough information to make

informed decisions about the Herbal Health care products that they buy (.757), Government does a good job in informing (AYUSH) the public about Herbal product (.746), Uses and beneficial effects of Herbal products (.602), This factor called as “**Informative Shoppers**” . The variable loading for the **Third Factor** contain, Potential side effects of Herbal Health care products (.702), Possible prescription (Drugs) communications (.592), How to report unwanted side effect or reaction (.833), How to safely use Herbal Health care products (.417) “**Secured Shoppers**”.

### **Factors of Innovativeness in buying Herbal Health care Products (KMO – 0.85)**

The variable loadings for the **First Factor** Comprise, I like to take a chance in buying new products (.685), I like to try new and different products (.498). Therefore, this factor can be named as “**Inventive shoppers**”. The variable loading for the **Second Factor** Comprise, I am the first in my circle of friends to buy a new product when it appears in the market (.426), I am the first in my circle of friends to experiment with the brands of latest products (.465). This factor called as “**novelty shoppers**”.

### **Influence of Academic qualification of the shoppers on Factors of Perception towards Herbal health care products, Information required related to herbal Health care products and Innovativeness in buying Herbal Health care Products.**

**Table – 7 ANOVA**

Dependent Variables		Sum of Squares	Df	Mean Square	F	Sig.
Shoppers Suitability	Between Groups	13.603	1	13.603	13.921	.000
	Within Groups	539.397	99	.977		
	Total	553.000	100			
Legalized shoppers	Between Groups	5.840	1	5.840	5.892	.016
	Within Groups	547.160	99	.991		
	Total	553.000	100			
Confused shoppers	Between Groups	8.056	1	8.056	8.160	.004
	Within Groups	544.944	99	.987		
	Total	553.000	100			
Preventive shoppers	Between Groups	16.305	1	16.305	16.770	.000
	Within Groups	536.695	99	.972		
	Total	553.000	100			
Informative Shoppers	Between Groups	26.479	1	26.479	27.761	.000
	Within Groups	526.521	99	.954		
	Total	553.000	100			
Secured Shoppers	Between Groups	27.129	1	9.043	9.458	.000
	Within Groups	525.871	99	.956		
	Total	553.000	100			
Inventive shoppers	Between Groups	9.426	1	3.142	3.179	.024
	Within Groups	543.574	99	.988		
	Total	553.000	100			
novelty shoppers	Between Groups	12.936	1	4.312	4.391	.005
	Within Groups	540.064	99	.982		
	Total	553.000	100			

The above table shows that the Academic qualification of the shoppers, on Factors of Perception towards Herbal health care products, Information required related to herbal Health care products and Innovativeness in buying Herbal Health care Products are statistically significant at the 5% level. There is a significant influence of educational qualification of the shoppers and the Factors of the Herbal health care products.

## CONCLUSION

This paper and the associated study brings out the classification of shoppers who buy healthcare products. Some of the interesting facets brought out include the influence of academic qualification on the perception towards healthcare products, the information they seek while purchasing healthcare products, as well as their risk appetite in trying out new things. This paper can be used as a basis and its results can be extrapolated to the benefit of potential marketing agencies to enable targeted campaigns for attracting consumers, and healthcare product companies to work on improving their product features and quality.

There is not at all scarcity in the demand for herbal products in the market. The consumers concern towards health risk and harmful effect of chemical products forcing them to switch over to natural products (Sharma, Shanker, Tyagi, Singh, & Rao, 2008)

How to capture this market and sustainable is a challenge for the Herbal Health care products.

The first and foremost task before Herbal health care product is to increase the familiarity. There is high favourability of Herbal health care products among its shoppers. According to expert brand having low familiarity and high favourability need to invest in marketing effort and must gain the attention of more people (Kotler P. , 2004). The brand loyalty of millennial shoppers towards Herbal Health care Products is low. They use more than one brand of herbal brand products at a time. They switched over to another brand in case of non-availability. The study has finally concluded that the Indian shoppers is growing more and more brand conscious when it comes to purchasing Herbal Health Care Products. The companies need to focus on the form of advertising which plays the biggest role here is internet and word of mouth the source of promotions are a key factor in a price sensitive economy like India. The brand loyalty and shoppers satisfaction are highly influenced by the shoppers attitudes, beliefs and perceptions play a key role of purchase decision making.

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## Psychological Health and Teachers'well-Being

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## ABSTRACT

*Health is a positive concept emphasizing personal and social resources as well as physical capacities. Emotions play an important role in life and contribute in personal and social health of an individual. Emotions may be external or physiological and internal or psychological. To develop emotional health the teachers themselves should have good emotional health. Mental health denotes a state of balance or equilibrium of our mind. Techniques to improve emotional health are redirection, sublimation and catharsis. Mental and physical illness has the adverse effect on students' performance and learning, outcomes. For the teachers it is essential to know the mental health of students. Some of the mental mechanisms are regression, compensation, hero worshiping, displacement, rationalization, projection and withdrawal. Well-being is a quality essential for the learner as well as the teachers. It affects the behavior of the individual in the entire three domains; cognitive, affective and psychomotor. Different research studies were done in order to find out the impact of different variables on psychological health and wellbeing. Teachers and school play a vital role in the development of psychological health and wellbeing.*

**Keywords:** *health- emotional health-mental health -mental mechanism-well-being*

## INTRODUCTION

The attainment and preservation of health reaches to the very core of human existence. In its broadest sense wellbeing is an overarching concern for every human being, group and society. Health is a state of wellbeing with physical psychological and spiritual attributes. Modern living has developed stresses and strains, mounting tensions and pressures in everyday life. Changes in the structure of the society and the family, leaving little cushion for an individual's problems and failures, has been showing adverse effects on the overall health of the individual. Increase in smoking and alcohol and drug intake, all contribute to the health problems both – mental, emotional and physical, affecting whole of the society.

## PSYCHOLOGICAL HEALTH

Physical and psychological health development, is not just developing the strength and stamina of the physical body and mind, but it is also implicated that it has to be used for elevating oneself from basic animal instincts to become normal human beings, great human beings, super human beings, divine human beings and reach that perfection and divinity itself. Our life should manifest that divinity within. Thus, health development at physical emotional and mental level should be in tune with the total developmental process from the lower level to the highest level of total freedom or perfection.

World health organization defined health as a "state of complete physical mental social wellbeing and not merely the absence of disease or infirmity. Health is a resource for everyday life, not the objective of living. Health is a positive concept emphasizing personal and social resources as well as physical capacities". (Datal et al., 2006.). The challenges of the modern age create a great threat to the emotional faculty of man. Yet the culturing of our emotions – development of our emotional faculties finds no place in the whole scheme of education. Man looks lost amidst the complexities of life unable to handle his emotional conflicts, blocks, and turmoil. The result is acute unrest, anguish and psychosomatic ailments or disorders

## EMOTIONAL HEALTH

Emotions play an important role in life and contribute in personal and social health of an individual. Continuous emotional disturbances affect mental, physical and social health. Emotionally stable individual leads a happy, healthy and peaceful life. Therefore emotional health is extremely important for the harmonious development of the personality. Emotions are the prime motive forces of thought and conduct and their control is very important. Emotion is a moved or stirred up state of organism. According to McDougall, an instinctive behavior has three aspects: Cognitive or perceptual aspect, affection or emotional aspect, and Conative or doing aspect. When a child sees a bull coming towards him he experiences an instinctive fear and undergoes three processes, he firstly perceives the bull, secondly he experiences an emotion of fear and thirdly tries to run away. It is therefore concluded that an emotion is an affective experience that one undergoes during an instinctive excitement

## CHIEF CHARACTERISTICS OF EMOTIONS

The emotional experiences are associated with some instincts or biological drives. The core of an emotion is feeling which is essentially linked with some sort of impulsive act to do. There is only a difference of degree between feeling and emotion. Every emotional experience involves several physical and psychological changes in the organism. Some of the changes are the flow of tears, increase of pulse rate etc. There are also internal physiological changes like circulation of blood the impact on the digestive system and changes in the functioning of some glands etc. These create both physical and mental health problems in an individual. Emotions are subject to displacement. They aroused on account of one stimuli gets transferred to other situations.

Emotions may be external or physiological and internal or psychological. The important signs of emotions in an individual are increase in heart rate, rise in blood pressure occurrence of changes in blood compositions, increase in respiration increase in muscle tension increase in perspiration etc. these in turn creates health problems in an individual. Some more common symptoms are resistance to learning, speech problems, excessive day dreaming, oversensitivity extreme dependence on peers or adults etc.

Emotions like affection, amusement, curiosity, happiness and joy are termed as positive emotions. Unpleasant emotions like anger, fear and jealousy which are harmful to individual health are termed as negative emotions. It is not that all the positive emotions are always good and all the negative emotions are bad. Excess of everything is bad. Whether the emotion is helpful or harmful to an individual depends on the frequency and intensity of emotional experience.

## TECHNIQUES TO IMPROVE EMOTIONAL HEALTH

*Redirection:* An emotion is dynamic in nature and cannot be suppressed totally. Anger is a furious emotion which exists in wild form in every organism. One has simply to tame and redirect it to beneficial channels for the benefit of the person and the society,

*b) sublimation;* It is also a sort of redirection and takes up much nobler and higher form example lust is transformed in to love for fine arts and social services or devotion to some deity. Anger turns to be Zeal and enthusiasm. Fear takes the form of anxiety for the betterment of mankind.

*C) Catharsis;* Intensity of the emotions are dangerous for health especially when they do not find expression. So catharsis of pent-up emotions is necessary for wellbeing of the organism. Play and extracurricular activities are very useful devices for this purpose. Positive suggestions may be used as an effective tool and negative suggestions should be avoided. The welfare of the individual and the society lies in the proper emotional functioning, so there is need of proper training and modification of the emotions.

## ROLE OF A SCHOOL AND THE TEACHER IN THE DEVELOPMENT OF EMOTIONAL HEALTH

Emotionally unbalanced teacher become prey to inferiority complex, and irritable and provocative. To develop emotional health the teachers themselves should have good emotional health. During adolescent period lack of information about sex causes emotional disturbances. Teachers may provide necessary information about the sex matters and problems. The curriculum in school does not relate to the real life of children. It is not according to the requirement of the society and hence emotional disturbances are created. So the schools should have activity and need based curriculum. Lack of recreational activities is also responsible for emotional disturbance. All children need provisions for the expression of their pent-up emotions and for redirection of their emotional behavior. So various co-curricular activities should be provided to children. Emotional health of a child bears positive correlation with his social health. Emotional adjustability is one of the important elements of social adjustment. Mental and physical illness has the adverse effect on students' performance and learning, outcomes. For a teacher it is essential to know the mental health of students.

## MENTAL HEALTH

It is difficult to see a person who is mentally healthy in all the aspects. Hence it is always better to talk optimum mental health in place of perfect mental health. It denotes a state of balance or equilibrium of our mind. For achieving an optimal level of mental health one has to first acquire adequate physical health. Health is rightly called wealth. It involves one's physical as well as mental health. Health is freedom from ailments. Mental health is like a physical health, consists of the absence of serious defects or mental ailments. Mental health has much wider scope than physical health as it aims for the development of wholesome balanced and integrated personality. One can ensure good mental health if one remains adjusted with oneself.

## SYMPTOMS OF GOOD MENTAL HEALTH

- He leads well balanced life of work, rest and recreation and satisfied with his profession or occupation.
- He is free from undesirable mental disturbances, disorders, conflicts, anxieties, frustrations ailments and diseases.
- He is self-confident and optimist. He does not exhibit undue fear and anxiety for any new assigned tasks.
- He is emotionally mature and able to express his emotions in desirable way and exercise proper control over them.

## SYMPTOMS OF POOR MENTAL HEALTH

- Emotionally unstable and easily upset
- Lacks self-confidence and will power, enduring power, decision making ability and tolerance
- No adequate adjustment with the self and the environment (physical. Social and professional).
- Suffers from frustrations, unresolved conflicts, strains and stresses, mental disturbances, disorders, ailments and diseases
- Unrealistic attitude towards life and people, lives in his own world of imagination and fantasy

## MENTAL MECHANISM OR DEFENSE MECHANISM

In defense mechanism an individual defend his anxieties and inadequacies in life. It is a sort of escapism from the realities of the situation for a while. There are several such techniques. A few important techniques which are considered significant in reducing mental tension and also maintaining mental health are described here.

*a) Regression:* it is a process of going backward or retaining to the past. It is an unconscious back tracking either in memory or in behavior, which might have been successful in the past. Regression in its extreme form may cause serious threat to an individual. *b) Compensation:* It is a process of making up deficiency of one area or trait development in another. eg. Student who does not show satisfactory results in the academic work may compensate in co-curricular activities. *c) Hero worshiping:* An individual identifies himself with popular hero. In identification, an individual seeks satisfaction in associating himself with the success of others. *d) Displacement :* An individual does something as a substitute for something else. An example a student who is rebuked by his teacher rebukes his younger brother or sister after going home. *e) Rationalization:* An individual tries to justify his failure by giving some excuses. This mechanism leads to self-delusion. *e).Projection:* In this mechanism, an individual put the blames of his own failure upon others or upon unfavorable factors in his environment. A student who is late in coming to school excuses himself by saying that the bus was late. *f) Withdrawal:* An individual tends to withdraw himself from the situation that causes failure or frustration. By doing so he is running away from difficult situation.

Teachers play vital role in school, society and Nation. So teachers' Well- being is more important in the society.

## TEACHERS' WELL BEING

Well-being plays a key role in the life of an individual. It affects the behavior of the individual in the entire three domains; cognitive, affective and psychomotor. Well- being is a quality essential for the learner as well as the teachers. Well- being requires harmony between mind and body. Well-being is concern with how and why people experience their lives in positive ways, including both cognitive judgment and affective reactions. Pavot and Diener (2003) defined wellbeing as the subjective feeling of contentment, happiness, satisfaction with life experience, sense of achievement and utility belongingness.

The concept of well-being originated from positive psychology. The focus of positive psychology is to study the improvement in the lives of individuals. The term wellbeing is used for specific variety of goodness such as living in good environment, being worth for the world, being able to cope with life, enjoying life etc. (Singh and Shyam,2007). It is a dynamic state characterized by a Reasonable amount of harmony between an individual abilities, needs and expectations and environmental demands and opportunities.( Levi 1987).

## RESEARCH STUDIES RELATED TO WELL-BEING

Mathur(1972) found that the main cause of frustration, mental conflicts which affects mental health of private aided school teachers are ; inadequate salaries, no interest in work, autocratic management, bad family condition, and too many restriction on their activities.

Delongie (1985) studied the relationship of everyday stress to mental health and well- being. He observed every day stress was linked with depression, somatic symptoms and health problem. Result indicates that those who are received low emotional support from families, friends and co workers develop mental health problems as compared to those who received high emotional support.

Hayers and Rose(1986) found that good physical health improved psychological wellbeing. They studied the effect of exercise, over weight and physical health on psychological wellbeing of 401 subjects. Results revealed that physical health helped to improve psychological wellbeing.

Wetzler and Ursano (1988) studied the relationship between the psychological wellbeing and seven physical practices such as sleep, physical exercise, breakfast snacking, relative body weight smoking and alcohol consumption. Psychological wellbeing measures were related to favorable health practices and were noted to improve with age. There are different methods to improve health and well-being.

## CONCLUSION

The mind is restless, turbulent and strong, as difficult to curb as the wind. One of the biggest challenges throughout the ages has remained to keeping the ‘making mind’ quiet. So just as we have to perform regular physical exercises to keep the body strong and fit, we also have to work holistically with all the layers of our existence in order that it will be capable of being kept still and focused. The school and teachers should improve their Physical, emotional and mental health and wellbeing so that they can live their life peaceful and meaningful way.

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## Integrated Awareness Study on Knowledge, Handling, Practice and Disposal of Biomedical Waste Management

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### ABSTRACT

*This study investigates integrated awareness about the knowledge, handling, practice, and disposal of biomedical waste management. The respondents chosen for this research are nurse, technician, and housekeeping of a leading hospital in Chennai. Totally 52 respondents have involved in this survey. The data is collected using questionnaires method and frequency analysis and one way ANOVA was used for the analysis of the determinants of the variables. The results are consistent and indicated that the employees have greater awareness and knowledge about biomedical waste management when compare handling practice of the employees.*

**Keywords:** Biomedical Waste Management, Awareness, Handling, Disposal.

### INTRODUCTION

Biomedical waste is any kind of waste that contains potential infectious material in the hospital or any healthcare establishments that is generated during diagnosis, testing, treatment and procedure. Biomedical waste contains 80% of infectious waste, 15 % of infectious waste, 3% of chemical and pharmaceutical waste, 1% radioactive and cytotoxic waste and 1% sharp waste. 506.74 tons of waste per day is generated among government and private healthcare establishments in India out of which only 57% waste undergoes proper disposal and treatment practice. Biomedical waste accidents are more prone to sanitation workers, medical and paramedical staff, patient and visitors and general public.

### BIOMEDICAL WASTE MANAGEMENT PROCESS

- Waste collection
- Segregation
- Storage
- Treatment
- Transport to final disposal site
- Final disposal.

### OBJECTIVE OF THE STUDY

The main objective of the study is to analyse the awareness level among nurse, housekeeping and technician about biomedical waste management in the hospital.

### REVIEW OF LITERATURE\

Mathur, V et.all (2011) conducted a cross sectional study to assess attitude and practice regarding biomedical waste management among staff and found that doctors and nurses were having better knowledge while lab technicians and sanitary staff were poor in all aspect and the biomedical accidents were low across all professional.

Kumar, C., Laveti, P., & Haldankar, S (2013) done a study on protocols that is been followed by various hospital across Maharashtra during waste segregation and disposal and found that proper awareness should be given to medical staff about waste management and various methods of waste disposal. They also found that they are lacking in training on the disposal of waste.

Gupta, N. K., et. all (2017) conducted a cross sectional to assess knowledge, attitude and practice of healthcare professionals handling bio medical waste in Lucknow and found from over 89 sample that there is a lack of knowledge and handling about biomedical waste management.

Patel, A et.all(2018) conducted a cross sectional study over 100 healthcare professionals in government medical college with structured questionnaire collecting sample include 50 intern doctors, 25 lab technicians and 25 staff nurses. They concluded from their study that intern doctors and nurse are well aware about biomedical waste management and Lab technicians lacks behind and they suggested continuous medical education and pre and post exposure prophylaxis and time to time amendment of rules.

Tony, et.all (2018) conducted a cross sectional and observation study by using self-prepared questionnaire and checklist across 15 clinic in Udupitaluk, the sample is collected from doctors, nurse and housekeeping staff altogether 130 samples aimed to analyze biomedical waste management process. Out of 15 clinic only 8 of them has basic biomedical waste management requirements rest all lack of training and non-compliance of segregation, collection and storage of waste under this study doctors and nurses has 100% knowledge and attitudes over biomedical waste management where as housekeeping is poor.

Bhalla, G. S. et.all(2019) conducted a study on the amendments implemented recently in biomedical waste management, as it is said biomedical waste management was introduced in the year 1998 July 20th as it is been upgraded regularly in year 2003 and 2011 and in the year 2016 the latest amendment of biomedical waste management rule was amended and simplified the biomedical waste management rule amendment in the year 2018 in comparison over previous version. Keeping in pace the health care setup with their required changes, they have highlighted the numerous health care product, device and kits disposal has not been mentioned in the latest amendment also and this article shows up all the grey area which needs clarification in the biomedical waste management rule.

Priya, D. N. et.all (2019) had done a study on the biomedical waste management and handling rules. Survey was conducted within four healthcare units to assess the effective implementation of biomedical waste management rule and to study status training, practice and handling of biomedical waste management disposal in healthcare unit. And also measure the quantity of hazardous and non-hazardous waste generated in various area of the healthcare units and technologies used for treatment of biomedical waste in India.

Nabiyouni N, & Franchetti M. J (2019) conducted program on waste management by using lean six sigma methodologies in a Toledo area hospital. They conducted a full analysis process of red bag waste management by lean six sigma approach. However many study as done improve waste management, this study will focus on all area and factors and these data illustrates that proper disposal and reduce 55% of waste generation which reduce environmental impact and cost cutting of healthcare facilities.

Sharma, M., & Uppadhaya (2019) conducted a cross sectional study to assess the knowledge and practice of biomedical waste management in a hospital in Rajasthan. Data collected through semi structured questionnaire from doctors, nurses, lab technicians and ward boys and found the necessity of comprehensive training for all workers.

Thomas, M., & Varghese, N (2019) concluded from their study that 73% have average knowledge and 99% has favourable attitude towards biomedical waste management. They also concluded that however attitude is high still the knowledge is low so they need a continuous medical education for class IV employees.

## RESREACH METHODOLOGY

### RESEARCH DESIGN

A quantitative research approach with is implemented in for this research, and sources of information that is used in this research is primary data. Total number of employees in St Thomas hospital in around 230, from which total number of sample involved in this survey is about 52 respondents. Well structured questionnaire with 22 questions into 4 categories is used to collect the information from the employees. Frequency analysis and one way ANOVA is used as statistical tool to analyse data and interpret result.

### ANALYSIS AND INTERPRETATION

In the frequency analysis, demographic characteristics are analysed that includes age, gender, department, education, experience. One way ANOVA is used to identify the difference between Department and level of awareness on biomedical waste management practice and level of knowledge among nurse, housekeeping and technician to prevent bio hazardous waste. Then Experience and knowledge of biomedical waste generation and legislation and assessment of behaviour/attitude towards biomedical waste management.

## Analysis between department and level of awareness on biomedical waste management practice

RESPECTIVE DEPARTMENT OF EMPLOYEES					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.171	7	1.310	1.752	.122
Within Groups	32.906	44	.748		
Total	42.077	51			

### INTERPRETATION

It is found from the table that there is no significant difference among Departments, and level of awareness on biomedical waste management practice. Researcher had chosen few departments like nursing, housekeeping and medical technicians for research and found that all staff works in each department are well aware of the biomedical waste management practices.

## Analysis between department and level of knowledge among staff to prevent bio hazardous waste.

RESPECTIVE DEPARTMENT OF EMPLOYEES					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	13.557	9	1.506	2.281	.035
Within Groups	27.071	41	.660		
Total	40.627	50			

### INTERPRETATION

It is found that there is significant difference among department and level of knowledge among nurse, housekeeping and technician to prevent bio hazardous waste. This means that staff are not much aware of how to prevent bio hazardous waste.

## Analysis between experience and knowledge of biomedical waste generation and legislation

EXPERIENCE OF EMPLOYEES					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.952	10	1.295	1.402	.214
Within Groups	37.875	41	.924		
Total	50.827	51			

### INTERPRETATION

It is found that there is no significant difference among experience and knowledge of biomedical waste generation and legislation. Years of experience doesn't influence or create any impact on knowledge of biomedical waste generation and legislation.

## Analysis between experience and assessment of behaviour/attitude towards biomedical waste management.

EXPERIENCE OF EMPLOYEES					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	8.660	8	1.083	1.104	.380
Within Groups	42.167	43	.981		
Total	50.827	51			

### INTERPRETATION

It is found that there is no significant difference among experience and assessment of behaviour /attitude towards biomedical waste management. This shows that experience also has no impact on behaviour or attitude towards biomedical waste management.

## FINDINGS

From the frequency analysis it is clear that majority of the respondents among 52 respondents were 42 female which is (82.7%) and 9 male which is (17.3%). The analysis also summarize the frequency of the age, the majority of the respondent falls in the age category (25-35) years of age which is (40.4%) while only (3.8%) falls under (45-55) years of age. And when it comes to educational qualification of the employees qualified below 12<sup>th</sup> grade and undergraduate has 34.7% each and the least is postgraduate which is(1.9%) then in

experience of the employees (50%) falls under 2-5 years of experience and the least is above 11 years of experience which is (3.8%). From one way ANOVA it is found that there is significant difference among the level of knowledge among nurse, housekeeping and technician to prevent bio hazardous waste and there is no significant difference among the level of awareness on biomedical waste management practice when compared with respective department of the employees. And there is no significant difference among knowledge of biomedical waste generation and legislation and assessment of behaviour /attitude towards biomedical waste management when compared with the experience of the employees.

## CONCLUSION

Importance of biomedical waste management is to be aware and avoid biomedical waste accidents which are more potentially infectious and hazardous to environment. Following the biomedical waste handling and disposal practice properly will ensure safety of the employees. So in the survey study it clearly shows that all nurse, housekeeping and technician are well aware but they lack little knowledge about biomedical waste management which can improve by conducting regular awareness classes and written test to find the effectiveness of the classes and provide biomedical waste management guideline near the generation area which will help them to dispose the waste properly.

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## Awareness of Health Insurance among Rural Areas in Virudhunagar District, Tamil Nadu

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### ABSTRACT

*In our buried lives there is always need for medical care and necessitating extravagant treatment. Favourably there is Health Insurance. Health Insurance covers from unforeseen hefty medical expenditure. Good health is the basic element of any economic growth of any country. In India especially in South TamilNadu has not reached the better awareness on health insurance. There is a requirement to improve the awareness of Health Insurance among rural population therefore this study was undertaken.*

**Keywords:** Health Insurance, Awareness, Rural

### ➤ INTRODUCTION

In developing countries like India particularly in rural areas "Health Insurance" is still an anonymous one. Due to their income earning capacity they are not shown much interest to spend for health insurance. Rural public also face equal risk as Urban, such as sickness, injury, accident and death. By cause of their socio-economic conditions such risks are more vulnerable to them. Government has taken more actions for providing health care facilities especially in rural areas. Minority of rural public are awake about the healthcare schemes and the increasing charge, but usually reject the need for health insurance with the thought that it may be irrelevant. Government and private health insurance companies, there has been enormous introduction in policies offered in the Insurance market. The present study is an attempt in the field of health insurance to distinguish the individual's awareness level.

### ➤ REVIEW OF LITERATURE

Jangati Yellaiah, "Awareness of Health Insurance in Andhra Pradesh" (2012) this study found that higher education and higher income level raise the awareness of health insurance. There is most important to understand people's perception and develop various schemes that are accessible, available, affordable and acceptable to all area of the society.

Maheshkumar L Choudhary, Kalpesh I Goswami, Sudha B Khambhati "Awareness of health insurance and its related issues in rural areas of Jamnagar district" (2013) assessed that there is need to provide financial protection to poor families. Health insurance could be a way of removing the financial obstacles and developing accessibility to quality medical care by the poor and also effective social security method. Awareness concerning health insurance is poor, therefore awareness creation is needed.

### ➤ STATEMENT OF THE PROBLEM

Virudhunagar District has 11 community blocks namely, Rajapalayam, Sivakasi, Virudhunagar, Sattur, Arupukottai, Vembakkottai, Srivilliputtur, Watrap, Thiruchuli, Narikudi and Kariapatti. 600 Revenue villages, 464 village panchayats, 11 panchayat unions and 10 town panchayats. Now a Days rural public face more health issues so their healthcare necessities are as same as urban. Good health of the nation is a basic element in the stability and economic growth. As a result of the overpriced services of the private health insurance sector do not reach the meager and poor who want it the most. There is a felt need to support fiscal protection to rural families for the medication of major sickness needing hospitalization and surgery. The present study was done with the aim that to know the awareness level of health insurance among rural areas in Virudhunagar District, TamilNadu.

### ➤ OBJECTIVES OF THE STUDY:

- To study the demographic characteristics of the respondents.
- To identify the awareness level and source of information about health insurance among the respondents in rural areas.
- To examine the awareness level on general health issues.

## ➤ RESEARCH METHODOLOGY

This study is based on Descriptive nature, for this purpose a structured questionnaire was framed and collected data from 200 respondents in Virudhunagar district, Tamilnadu. Convenient Sampling Method was used for this research. Both primary and secondary data applied for the study. Data were analysed to find out the relationship between awareness of health insurance and independent variables such as socio-economic variables. Statistical tools like percentage analysis, frequency distribution, mean score with rank correlation was applied by using SPSS software for this study.

**Table. 1 Socio Demographic Profile of Respondents on**

### Awareness of Health Insurance

Demographic Factors	Category	Frequency	Percentage (%)	Health Insurance Awareness	
				Aware (%)	Not Aware(%)
Gender	Male	88	44	56 (64)	32 (36)
	Female	112	56	49 (44)	63 (56)
Age	20-30 years	40	20	24 (60)	16 (40)
	31-40 years	61	30.5	36 (35)	25 (65)
	41-50 years	53	26.5	23 (43)	30 (57)
	51 and above	46	23	12 (26)	34 (74)
Educational qualification	Illiterate	33	16.5	11 (34)	22 (66)
	Up to High School	45	22.5	17 (38)	28 (62)
	Hr. Secondary	68	34	29 (43)	39 (57)
	Degree	32	16	12 (38)	20 (62)
	PG	22	11	14 (64)	8 (36)
Occupation	Business	21	10.5	14 (67)	7 (33)
	Daily Wager	74	37	28 (38)	46(62)
	Farmer	60	30	19 (32)	41(68)
	Private	29	14.5	9 (31)	20( 69)
	Government Service	16	8	13 (81)	3 (19)

Source: Primary data

From the above table it is inferred that with regard to gender, male constituted 88 (44%) and 112 (56%) females. Awareness was higher among male respondents 56(64%) than female respondents 49 (44%). The highest number of respondents belonged to the age group of 31-40 years 61 (30.5%), followed by 41-50 years 53 (26.5%), 51 and above 46 (23%) and 20-30 years 40 (20%). Respondents under the category of 51years and above age, 34 (74%) of them were not aware of health insurance services, at the same time under 20-30 years of age, 24 (60%) respondents were aware about health insurance schemes. Among respondents educational qualification 33(16.5%) were illiterate, 45(22.5%) has up to high school education, 68 (34%) possess higher secondary school education, 32 (16%) were graduates and 22 (11%) were post graduates. In the category of educational qualification, 22 (66%) illiterate respondents were not aware about health insurance, 14 (64%) post graduate respondents were aware about health insurance. Based on the respondents occupation 21 (10.5%) belongs to business, 74 (37%) of the respondents belongs to daily wager, 60 (30%) of the respondents are farmers, 29 (14.5%) of the respondents belongs to private employees, 16 (8%) of the respondents belongs to government service. The study respondents under the category of government service 13 (81%) were aware about health insurance, 20(69%) private employees and 41 (68%) farmers were not aware about health insurance.

**Table-2: Source of Information About health insurance**

Source of Information	Frequency	Percentage
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Television	54	27
Radio	25	12.5
Newspaper	22	11
Internet	18	9
Agents	12	6
Family	32	16
Friends	37	18.5
<b>Total</b>	<b>200</b>	<b>100</b>

Source: Primary Data

Table 2 shows that source of information about health insurance. Majority 54 (27%) respondents got information from television, followed by 37(18.5%) from friends, 32(16%) from family, 25(12.5%) respondents got source of information from radio, 22(11%) from newspaper, 18 (9%) from internet and 12 (6%) respondents got information from insurance agents.

**Table-3: Awareness on General Health Issues  
Mean Score with Rank Correlation**

Variables	5	4	3	2	1	Total	Mean Score	Rank
Poor Nutrition	30	36	34	45	55	200	2.71	3
Working Conditions	28	23	47	33	69	200	2.54	5
Sanitation Problem	32	41	18	49	60	200	2.68	4
Population problem	29	34	28	27	82	200	2.51	6
Medical care problem	25	51	19	60	45	200	2.76	2
Waterborne Diseases	27	42	39	52	40	200	2.82	1

Source: Primary Data

The findings of the study revealed that, waterborne diseases is the prime important awareness on health issue among rural areas with mean score value 2.82 was ranked 1, medical care problem is the second important health issue with mean score value 2.76 was ranked 2, poor nutrition is the next significant health issue among rural areas with mean score value 2.71 was ranked 3, sanitation problem is the forth big health issue with mean score 2.68 was ranked 4, working conditions is the next leading health issue with mean score 2.54, was ranked 5, population problem is the huge health issue in rural areas with mean score 2.51 hold 6<sup>th</sup> rank..

## ➤ CONCLUSION

The present study shows that bulk portion of rural public are still not well aware of health issues and about health insurance facilities. Health condition of public is treated as a significant economic index of improvement for Indian economy. In few rural areas public were knowledgeable about health insurance schemes, but were not familiar about the thorough details and advantages of the scheme. Certainly there is an alarming requirement to develop the awareness with regard to knowledge about health insurance to rural public.

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## The Study on Promotional Strategies and Patients Satisfaction on Health Care Services of Private Hospitals in Chennai

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### ABSTRACT

*The Aim Of This Paper Is To Examine Promotional Strategies And Patient Satisfaction And Establishes The Effectiveness Of Varied Services And Sales Promotional Tools Provided By Multi-Specialty Hospitals. The Nature Of The Study Adopted By The Researcher Is Descriptive And Analytical Research Design. The Data Has Been Tabulated And Analyzed And By Using Statistical Package For The Social Sciences (Spss) The Population Is Indefinite And Therefore The Researcher Has Selected 60 Respondents From Each Multi-Specialty Hospital According To His Convenience. It Is Found That There Is A Strong And Positive Relationship Between The Effectiveness Of Promotional Strategies And Patients.*

*Keywords: Promotional Strategies, Patient Satisfaction, Healthcare*

### INTRODUCTION

In modern economies, service sector plays an increasingly important role in terms of its economic process and effective services. Above all, health care industry is growing at a tremendous pace due to its skilled professionals, infrastructure, updated technology, various services and increasing expenditure by public also as private players. Health care sector has become one of the largest sectors in India in terms of revenue, evolution and employment. Indian government became involved in health care by establishing hospitals and introducing various reforms to the Industry. Government hospitals mostly not run profits but are setup to supply humanitarian services to the community and hence the patient's expectations towards it also are very minimal. The government alone cannot meet the infrastructure, capacity and delivery shortages existing within the current health care system. There has got to be increased participation of private sector within the Public Private Partnerships (PPP) schemes for infrastructure, capacity development and delivery.

The multi-specialty hospitals at Chennai have witnessed a tremendous growth in the last few decades. With an increasing demand for best treatment and best facilities, the private multi-specialty hospitals at Chennai have established world class quality treatments, hi-tech equipment, expert and experienced professionals and sophisticated environment. Nearly all hospitals in metropolitan cities like Chennai have grown to a very world class stature over the years. Considering its heavy competition and increased number of customers, forces and insists them to offer more importance for quality and promotional strategies such as word of mouth, demonstrations, media interview, service package, free services, doctor's profile and advertisement.

### OBJECTIVES OF THE STUDY

- To evaluate the effectiveness of promotional strategies adopted by select multi-specialty hospitals at Chennai city.
- To identify the impact of promotional strategies on patient satisfaction with respect to health care services of select multi-specialty hospitals at Chennai city.
- To offer suggestions to make improvements in the promotional strategies to enhance patient satisfaction towards health care services.

### SCOPE OF THE STUDY

The present study is essentially related with promotional strategies and patient satisfaction and establishes the effectiveness of varied services and sales promotional tools provided by multi-specialty hospitals. It attempts to research how far the promotional strategies have an impact on satisfaction of the patients in select twelve private multi-specialty hospitals at Chennai city, Tamil Nadu. Chennai plays an

important role in the growth story of health care sector in our country. Hence the study covers only multi-specialty hospitals at Chennai city. The study elicits the perception of the patients towards promotional strategies namely advertising, sales promotional tools, public relations and publicity, direct marketing and personal selling, effectiveness of sales promotional tools and the satisfaction of the patients towards health care services.

## RESEARCH METHODOLOGY

### Research Design

The nature of the study adopted by the researcher is descriptive and analytical research design. In this study, the data collected from the respondents are analysed by using effective statistical tools and critical evaluations are made to find the impact of promotional tools on patients' satisfaction towards health care services.

**Primary Data:** It refers to the knowledge obtained afresh and for the primary time for the specific purpose of the study. It's collected from the patients by using interview schedule method with reference to their perception and effectiveness regarding promotional strategies and their satisfaction towards health care services offered by select twelve private multi speciality hospitals at Chennai city.

**Secondary data:** During this study, secondary data were collected from the hospital records and documents concerning the details of promotional strategies and various health care services offered by them. The information associated with current scenario of multi-speciality hospitals, their services and promotional activities adopted by them to satisfy their patients were collected from the websites, journals, articles and dissertation.

**Sampling Technique:** The population is indefinite and therefore the researcher has selected 60 respondents from each multi-specialty hospital according to his convenience. Hence, the sampling technique adopted for this study is convenient sampling technique.

## REVIEW OF LITERATURE

- Ala'Eddin Mohammad (2013) examined the effect of marketing mix strategy on patient satisfaction privately sector hospitals in Jeddah city in Kingdom of Saudi Arabia (KSA). To explore the connection between independent and dependent variables the quantitative method was used to collect primary data through a questionnaire, which was administered within the private sector hospitals in Jeddah city with hospital managers. The researcher retrieved 190 valid research questionnaires. A purposive sampling strategy was used to choose the participants during this research. The result shows significant differences within the influence of the marketing mix strategy. The result concluded that five out of seven variables are significant on the opposite hand two variables are insignificant (pricing and distribution strategies). Finally, the study provides useful guidelines for further and future research possibilities.
- Mithilesh Kumar et al. (2016) assessed the standard of services obtained from a tertiary care hospital in Ranchi, Jharkhand. A descriptive, cross sectional, hospital based study was conducted between July to September 2015 in Rajendra Institute of Medical Sciences (RIMS), Ranchi. A complete of 168 indoor patients were selected as study subjects and interviewed on the day of discharge by a pre-tested semi structured questionnaire. The results of the study found that the majority of the patients were in their productive age bracket and belonged to lower class. Additionally, most of the patients were satisfied with the behaviour and services of doctors, nurses, lab technicians and investigations done. The patients were little satisfied with availability of doctors within the ward, ward attendants, and enquiry counter. The patients were less satisfied with the medicines provided within the hospital and cleanliness of toilets and bed sheets. Most of the patients (76%) were satisfied with the general services available within the hospital. Therefore, the study concluded that assessing satisfaction of patients may be a simple and price effective way for evaluation of hospital services. Overall, most of the patients were satisfied with the services provided within the hospital although there have been some areas which needed to be improved.

## DATA ANALYSIS AND INTERPRETATION

### Impact of Effectiveness of Promotional Strategies on Satisfaction of patients towards Health Care Services

**Null Hypothesis:** There is no significant impact of effectiveness of promotional strategies on satisfaction of patients towards health care services.

**Alternate Hypothesis:** There is a significant impact of effectiveness of promotional strategies on satisfaction of patients towards health care services.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.906	0.820	0.820	30.67755

From the above table, the R value is 0.906 which indicates a high degree of correlation. . In this case, 82% of the observed variability in patients' satisfaction towards health care services can be significantly explained by their opinion towards effectiveness of promotional strategies adopted by select 12 multi-specialty hospitals.

## ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	2823809.275	1	2823809.275	3000.503	<0.001 <sup>**b</sup>
Residual	619251.602	658	941.112		
Total	3443060.877	659			

From the above table, the linear combination of effectiveness of promotional strategies is significantly related to the patients' satisfaction towards health care services ( $F = 3000.503$  and  $P = <0.001^{**}$ ) and it is significant at 1% level.

## FINDINGS

It is found that there is a strong and positive relationship between patient's perception towards promotional strategies and the effectiveness of promotional strategies. It is also identified that maximum correlation exists between sales promotional tools and effectiveness of promotional strategies.

It is found that there is a strong and positive relationship between the effectiveness of promotional strategies and patients satisfaction towards health care services. It is also identified that maximum correlation exists between the effectiveness of promotional strategies and facilitating services.

## SUGGESTIONS

It is suggested that through their medium of advertising in television, print and radio they should communicate their messages in ways which still remain uniquely effective, truthful and honest in spite of other competitors in the mass media.

Improving the patient care in all aspects is a priority care for all healthcare providers with the overall objective of achieving a high degree of patient satisfaction. It is suggested that fundamental requirement for any healthcare hospitals is that adoption of „patient orientated“ system than “profit-oriented”

## CONCLUSION

Based on the findings, the perception of the patients towards promotional strategies is at moderate level for all the select 12 hospitals. Hence, the hospitals need to adopt distinctive and attractive promotional strategies which might make the patients to perceive positively. The patients have low level of opinion regarding effectiveness of promotional strategies. Hence, the multi-specialty hospitals should follow fair and adoptable promotional strategies to improve the confidential level of the patients and to draw in more patients to urge services from them. Consequently, extra care and energy must tend to enhance the health care services to realize ultimate satisfaction of patients towards them. The study has suggested various measures considering the health and life care of the patients. Hence, it's concluded that the healthcare sector is to market optimum level of well-being and to assist the patients in improving their lives consistent with the suggestions provided and in accordance with the expectations of the patients towards health care services. If the The multi-speciality hospitals can become more popular if these suggestions translate into activities.

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## Role of Pharma in Indian Healthcare Ecosystem: Do's and don'ts.

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### ABSTRACT

*This study is doctoral by nature and in its primitive stage. Pharma Industry is one of the important pillar of Indian Healthcare ecosystem. Apart from the conventional roles of Pharma companies like manufacturing, marketing medicinal products, they can do numerous function that can be beneficial in promoting positive health in developing country like India. Pharma Industry is the only component of the ecosystem can do wonders in making healthier India. The goal of the this research paper is that the Healthcare Ecosystem of the developing country like India shall function fairly and smoothly for better healthcare delivery system. Next is each person from the lowest economic strata shall get informed medical treatment and services and finally all the components of the Healthcare Ecosystem shall function in tandem and act as a one whole team for promoting health. The aims of this research are to find out whether the myth that Pharm industry apart from their commercial responsibility of making drugs available , they also dose many other function for balancing the healthcare ecosystem. Pharma Industry is one of the important component of Healthcare ecosystem. To understand the exact nature of Pharma Industry responsibility beyond manufacturing and marketing drugs. To understand and suggest what Pharma industry can do better than what they are doing in balancing the Indian Healthcare ecosystem. This shall be an eye opener for the medical fraternity and further detailed research would also help to explore further facts.*

**Keywords:** Healthcare Ecosystem, Healthcare Industry, Pharma Companies, Pharma / Pharmaceutical Industry, Role of Pharma Companies / Industry, Branded Medicine, Generic Medicine, Banded Generic Medicine, Pharmacy / Chemist, Retailers

### INTRODUCTION

#### Healthcare Ecosystem

Pharmaceutical Industry is one of the important pillar of healthcare industry. It play major role in Healthcare ecosystem.



## **The healthcare ecosystem consist of**

1. Healthcare Service Providers: Doctors, Para Medical Staff, Hospitals, Clinics, Diagnostic Centers
2. Pharmaceuticals Industry
3. Pharmacy (Chemist) though it is part of Pharma industry as it is the sales distribution network.
4. Patients.

In this healthcare ecosystem, patients are the only beneficiaries of the services provided by Healthcare service providers, Pharma industry and the retailers (Chemist).

Hospital, Nursing homes, Clinics, Diagnostic center and Pharmacy all these component of healthcare ecosystem operate locally from fixed locations. Patients avail their services by visiting them.

Pharma Industry is the only component of healthcare ecosystem that does not operate locally, they are present across cities, states, countries and sometimes all over the world. They are the only component of the ecosystem, which connect all the other three components of the ecosystem and operate worldwide.

## ***Pharma Industry connecting Doctors and Hospitals***

Pharma Industry meets the doctors make them aware about the availability of their products in various brand name. They also informed the medical fraternity about the invention and the new innovative researched products. They visit hospital authority make the product available in the hospital supply and hospital pharmacy.

## ***Pharma Industry connecting Pharmacy / Chemist / Retailers***

Pharma through their distributions network make their products available in the Pharmacy across the countries length and breath. They commercially connected with these chemist; they also display their products in the chemist retail outlet, in malls, departmental stores etc.

## ***Pharma Industry connecting Patients and the masses***

Patients visit doctors, doctor prescribe medicine, Patient's purchases medicine prescribed by the doctors from the chemist. Patients are operated and treated in hospitals, with medicine either from the hospitals medicine supply or hospital chemist.

Patients also purchase nonprescription and OTC drugs like protein powders, food supplements, minerals, vitamins etc. from local chemist, Malls, departmental stores etc.

Pharma industry also makes many prints, digital, social and electronics media advertisements for their OTC / non-prescriptions drugs so that they can come closer to the masses.

Thus Pharma industry has connected to all the healthcare ecosystem components, hence they play an important role in Healthcare industry.

## **OBJECTIVES**

The objective of this research is as given below:

1. To study the Indian Healthcare Ecosystem
2. To study what is the current role of Pharma industry
3. To suggest Pharma Industry what they can do apart from their current activities for promoting health and advise them on what they should avoid so that the Indian healthcare ecosystem can function smoothly.
4. To study the current trend of generic medicine / Branded generic and their proper implementation in India Pharma Industry

## **LITERATURE REVIEW**

The Pharma Industry has tremendous role in influencing prescribing habit of doctors. The pharma company promotes their product by Direct-to-Consumer promotion, through electronic and social media, conferences etc. The influence can also be made by small gifts as brand reminder, sponsorship for CME etc. Also, influence by studying and analysing the prescriptions habit of doctors. Doctors do interact with the sales representative on various aspects of drugs especially the new launched.

The pharma Industry role is beyond gifting's. Pharma Industry role are continuously scrutinize. Pharma Industry is beyond gifting they do involved in research-oriented and education-oriented interaction with the doctors either by direct meeting with individual doctors through product brochure, literature, scientific studies or through continuing medical education (CME).

## NEED OF STUDY

As mention in the previous chapter Pharma, industry is the only component of healthcare ecosystem, which connect all the other components. Thus, Pharma Industry is one of the important component of the ecosystem. Therefore, it is mandatory to understand what, is the role of the Pharma Industry in promoting healthcare in developing country like India.

There are many articles on the various role of Pharma Industry; this study will focus on the newer role of Pharma industry. This study will also bring into notice that what Pharma industry should not do, thus maintaining the nobleness of the healthcare professions.

## DISCUSSION: PHARMA ROLE IN HEALTHCARE INDUSTRY

### *Role of Pharmaceutical Industry*

The conventional role of the Pharma industry is as follows;

1. Manufacturing of drugs
2. Marketing, Distributions and Sales of the drugs.
3. Bringing new research product from other country and manufacturing or marketing the product in their home country.
4. Making the products available to the hospitals and medical professionals.
5. In-house Research and development of the new molecules

### *Newer Role of Pharmaceutical Industry*

The role of Pharma industry is not limited only to manufacturing and sales of drugs. Its role is beyond this.

The role of pharma industry can be divided into three major categories.

1. What Pharma company should do?
2. What Pharma company should not do?
3. Generic verse branded medicine

### *What Pharma Company should do?*

The pharma company shall do the following things for the better functioning of the healthcare industry.

#### **1. RESEARCH AND DEVELOPMENT**

Pharma Company should sponsor the research of the new molecules. However, they are doing in-house research, but they should also help the upcoming scientist, academicians and institutes in their research programs by sponsoring them, helping them in bringing new research technology etc.

#### **2. NEW MOLECULES**

Pharma company should bring new researched molecules from developed country and other countries to their home country. Manufacturing, marketing and making the product available for their country fellowmen.

#### **3. QUALITY PRODUCT AT AFFORDABLE PRICE.**

Pharma Company should manufactured their product with the help of the new technology. This will not only help in making the product quality world class but due to better quality and large quantity will also help to bring down the price of the product and thus making it affordable to the masses.

#### **4. CONTINUOUS EDUCATION TO MEDICAL FRATERNITY.**

Currently the Pharma industry do put their efforts in educating the medical professional. However most of the time it is more commercial rather than a serious education. Pharma industry should not only educate on their products but also other products and topic not pertaining to their product category.

Most of the time the education focused on the practicing doctor. They should also impart education to the academicians; medical students. They should also conduct series of medical education to the medical students especially on innovation and new products.

## **5. CONTINUOUS EDUCATION AND AWARENESS OF HEALTH RELATED ISSUES TO THE MASSES.**

Every day we are bombarded with many advertisements on print, electronic and social media from various Pharma company related to their products. All these advertisements are commercial. We are looking towards the Pharma industry to also educate the masses regarding health related issue. Until today, educating the masses on health related issues is seen as only government responsibility. However, if the Pharma industry can take some responsibility towards educating the masses it will be a great help to humankind.

## **6. SHARING PATIENTS DATA FOR RESEARCH PURPOSE AND NOT FOR COMMERCIAL USES.**

Proper network of doctors, patients and chemist will enable Pharma Company can have easy access to very rich patient data related to disease profile, treatment, efficacy and safety of drugs. Proper reporting is the key for better understanding of the drug, disease profile, regional difference, age factors and the diseases conditions. Sharing such data, making such data publicly can be enormous help to the researcher. As these important data with valuable information can be easily used by various agency free of cost. These will help to understand state wise, country wise disease profile, effectiveness of the drugs and its side effects. These will help medical fraternity; a better patient management by formulating better treatment protocol etc. state wise, country wise based on the data provided and these data can be base for newer inventions.

## **7. MEDICAL COMMUNICATIONS.**

Unbiased medical communication, in terms of drug indications, interaction, revealing and communicating and writings with bold letters all the important and serious side effects to the medical fraternity

## **8. CSR PROJECTS**

Under Corporate Social Responsibility (CSR) many top Pharma company are doing good job by providing free medications, food supplements like protein powders, vitamin and minerals for mother and child etc. programs. If all Pharma company contribute in this noble, activity of CSR it will definitely help country like India to achieve Sustainable Development Goal (SDG) by 2030 of single digit Neonatal Mortality Rate.

### ***What Pharma company should avoid doing?***

Following activity, Pharma Company should avoid

1. Unhealthy Competition.
2. Unhealthy Practices.
3. Pharmacy treating patients instead of selling medicine.
4. Promoting Antibiotic Resistance.
5. Generic medicine / Branded Generic Medicine verse Branded medicine.
6. Substitution by Pharmacist: of prescribed brands / branded products with either generic medicine or medicine with lower efficacy product for higher economic benefits.
7. Doctors at the risk and the most vulnerable target in the Healthcare Ecosystem

### **1. UNHEALTHY COMPETITION**

Pharma Industry is one the biggest industry in India. Indian Pharma Industry ranked worldwide 12th in Value and 3<sup>rd</sup> in Volume. Obviously, there are many payers to grab the market share. There is nail tooth competition to acquire the top positions. Healthy competitions is always well come because such healthy competition check the quality, pricing and most importantly the customer satisfactions and the added services to the customer. However, there are instances and temptation for unhealthy companions also. For example;

- Keeping brand name of new product similar of the existing top brand.
- Changing the formulation of the old top brand name with new formulations

Both the above example can lead to the medical error. Doctors may prescribe wrong medicine to the patient's and Pharmacist may issue wrong or substitute wrong medicine. In either case the patient treatment outcome will not, what it was predicted?

## 2. UNHEALTHY PRACTICES

The Pharma Company may indulged themselves in unhealthy promotions. Heavy promotions and focusing on the selected doctors or top practicing doctors for special promotion. Under the name of promotions, the Pharma Company may give undue favours, sponsorships, gifts to the doctors.

For the sake of market share and profit The Pharma, company may promote their brands to quacks (Unqualified Doctors).

## 3. PHARMACY TREATING PATIENTS INSTEAD OF SELLING MEDICINE

Pharmacist are allowed to sale the medicine, but they are not allow to treat the patient's neither they are allowed to allow to substitute the drug prescribed by the doctors. They may substitute the prescribed brand, but not the medicine inside the brand.

It is understood that when doctors are not available especially in remote places and in case of emergency, they may give some medicine to the patient's (though it is not permissible) but with advice that the patient should consult the doctor immediately. However, it is seen that it has become a routine for the patient to visit chemist for their common ailments like headache, diarrhoea cold and cough, fever, stomachache etc. The chemist do entertained the patients and start treating them. Once in while it is Okay, but if the same patient is visiting regularly for the same symptoms then it is criminal on the part of chemist to treat the patient. The chemist may missed important diagnosis like tumor in brain for headache, malaria or dengue for fever; he may also missed cancer as a caused to the patient's symptoms.

Therefor the pharmacist should avoid treating patients for the benefit of the patients.

## 4. PROMOTING ANTIBIOTIC / ANTIMICROBIAL RESISTANCE

The major reasons for antimicrobial resistance is the misuse of the antibiotics like unnecessary use of antibiotics and incomplete course of antibiotics. Pharma Company keep on promoting various antibiotics for the same common infections to the medical fraternity either by personal meeting by visiting doctor's clinic or in medical conferences. These Pharma Company also misguide the medical fraternity by promoting newer antibiotics to the common infection where the existing antibiotics can take care. There is no use for such stronger newer antibiotic for simple, uncomplicated infections. To prevent the resistance of newer antibiotics, and also for the existing antibiotics, the use of antibiotics should be minimal and used only when it is required. Newer antibiotics should reserve for specific and complicated infections only when the existing antibiotics is not working. Pharma Company promoting antibiotics especially to the non-allopathic doctors can increase misused of antibiotics, which can lead to resistance of antimicrobial.

Pharmacist who also try to treat the patient's on his / her own and may misused antibiotics specially in case of viral infections where there is no role of antibiotics can further add to antibiotics resistant.

## 5. GENERIC MEDICINE / BRANDED GENERIC MEDICINE VERSE BRANDED MEDICINE.

The pharma company make their brand available to the chemist through their distribution channels of CNF or super stockiest, distributer, stockiest. The sales team visit doctors and hospital personally all over the country. The sales team make the doctors aware about their brands by personal meeting and through medical conferences, symposium trade fairs etc.

Thus, promoting branded product carry lots of cost

1. Operating cost
2. Cost of sales team Salary
3. Marketing cost
4. Distribution Cost

More than 40 to 45 % of sales revenue is spent on marketing cost, which includes staff salary and promotion cost. In addition, there is also distribution cost as given below,

Thus to promote any branded product to the doctors, it carries lots of operating, salary, marketing and distribution cost. In generic medicine or branded generic medicine, there is no Marketing cost and sales team salary. As these medicine are not promoted by sales team, by making personal visit to doctors and hospitals. Neither these medicine is promoted through medical conferences, symposium or trade fairs. Thus, generic medicine has only operating cost, which is also minimal, compared to branded product. As the number of operating staff required for generic medicine is less compared to branded products. Similarly, the distribution cost for the generic medicine is also less as the distribution is not that complicated and the number of distribution partners are also less compared to the branded products. Retailers can either directly purchase from CNF or the super distributors.

Thus, in branded generic or generic medicine, the sales team salary and the marketing cost is completely avoided and the operating and distribution cost is less compared to the branded medicine. Thus, these saved costs can be passed on to the patients purchasing the generic medicine. In addition, the end-user will have the same medicine in the form of generic medicine at less price. The customer will end up in total savings of varying from 40 to 70% cheaper compared to the branded products. Branded generic or generic medicine the MRP is similar to the branded products but the chemist pass on the economic benefits to the patients.

Most of the time especially in case of the top 20 pharma companies they manufactured both branded products and branded generic. They manufactured and market branded products in the market under their own brand names. They also manufactured branded generic medicine and put into the distribution channel. The other small time Pharma manufacturers manufacture either branded generic or only generic medicine and put into the distribution channel.

Cipla is one the top exporter of Anti HIV generic medicine especially for African countries.

Therefore, for the benefits of the patients below poverty we should promote Generic medicine for chronic diseases like Diabetics, Hypertension and Cancer. Generic medicine belonging to these diseases segments, which are most commonly used as first line treatment and medicine whose patent is not active such type of generic medicine should be encouraged by the government and Pharma companies.

## 6. SUBSTITUTION BY PHARMACIST

**Pharmacy substituting of prescribed brands / branded products with either generic medicine or medicine with lower efficacy product for higher economic benefits.**

Retailers get 20% margin on MRP for branded products, but for generic and branded generic medicine, they earn up to 70% margin on the MRP. Most of the time Pharmacist at the chemist substitute doctor's prescription of branded products with generic or branded generic medicine under the pretense of non-availability of products. While substituting the generic medicine for branded medicine the chemist does not pass on the economic benefit to the patients.

We understand that the chemist is here to do business and to earn profits. However, the pharmacist should be transparent and informed patients accordingly. They shall pass on the financial discount to the patient's, which is their right.

## 7. DOCTORS AT THE RISK AND THE MOST VULNERABLE TARGET IN THE HEALTHCARE ECOSYSTEM

According to the new prescription guidelines, it is mandatory for doctors to write the name of the drugs in form of "generic name" and not the "Brand names" of the medicine in their prescriptions. This give freedom to the Pharmacist to give any medicine to the patient. He is free to give either generic or branded generic or branded medicine to the patient's on MRP. He may or may not pass on the financial discount to the patient's or even he pass on the benefits he will not pass on the full benefits of the generic medicine discount to the patients.

When the chemist sale generic medicine to the patient instead of branded medicine or the prescribed brand by the doctors, the chemist should make sure that the generic medicine, which he is, substituting the doctor's prescription should be from renowned Pharma Company, following all the quality norms while manufacturing the generic medicine. In such situation, doctors are vulnerable, as the patient's trust the doctor's prescription and the doctors trust the branded medicine from his previous clinical experience with the said brand from the

said Pharma Company. However, it is the Pharmacist substitute the doctor's prescription, but the patient's will not hold the chemist responsible for any untoward incidence. He / she will always blame the doctors for such unfavorable outcome and malign the doctor's image professionally.

Thus for promoting better health and Healthier India Pharma Company should avoid the above mention activities.

## CONCLUSION

Pharma Company held lots of commercial and moral responsibility in the Healthcare Ecosystem. Their activities should be target for the betterment of the society. They should try to avoid actions that can be hindrance to the promotion of health. Therefor it is mandatory for each Pharma company big or small to act sensibly so that India can be one of the healthiest country.

Pharma Company should focused on what they are good in like manufacturing medicine at best quality and at affordable price and marketing ethically to the doctors.

## LIMITATIONS

This study is more of the inner thoughts of the author, which is gather from last two decades from his vast industry experience and domain expertise. However, the author has also interacted with some Key opinion leaders of the industry. This study is not done by conducting the survey, getting different views on a large scale, by personal interview with questionnaire or from mass emailing of questionnaires.

## IMPLICATIONS

The study has following implication, which can benefits the Indian Healthcare ecosystem

1. The research paper will be an eye opener for the healthcare stakeholders of developing countries like India but also for the healthcare holders all over the world.
2. The suggestions and description mention in this paper will help the Pharma Company to redefine its role.
3. This paper will give food for thoughts specially on the importance of Generic medicine
4. This paper may be able to reduce the medical error of prescription and substitutions of brands
5. This paper may enlighten the Pharmacist and the Pharma company on how to reduce antibiotic resistance
6. This paper may prevent the chemist from treating the patients.
7. The study will help the Pharma industry and the healthcare industry as a whole.
8. The study will help pharma industry in understanding its role.
9. The study will also help the Pharma Industry to retrospect its role and thus help in better functioning of the industry.
10. The study will help in for better functioning of and thus promoting the healthcare.
11. The study will be benefiting, the patients and the masses as they are the only beneficiaries of the healthcare ecosystem.

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## A Study On Public And Private Hospitals In Mumbai And Its Impact On Patient Satisfaction Level.

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### ABSTRACT

*Many a time employee engagement and work engagement is used interchangeably. Employee engagement is association between employee and organisation (employer) and work engagement is association between employer and its work itself. Work engagement is classified into three parameters of vigour, dedication and absorption. Under the current research, researcher has used the sample of 30 doctors working in government and private hospitals located in Mumbai to identify the work engagement level among doctors. Snow ball sampling is used to collect data from doctors from government and private hospitals. The sample of 50 patients of government and private hospitals is undertaken to find out their satisfaction in respective hospital they have visited for medical treatment. Convenient sampling is used to collect data from patient located in Mumbai. Various studies in India and abroad is reviewed under the current research to identify gap.*

*Keywords: Work Engagement, Patient Satisfaction Level.*

### INTRODUCTION

Many a time employee engagement and work engagement is used interchangeably. Employee engagement is association between employee and organisation (employer) and work engagement is association between employer and its work itself. Work engagement is classified into three parameters of vigour, dedication and absorption. Current research analysis the impact of doctor's work engagement on overall patient satisfaction level. Under the current research, to identify the work engagement level among doctor's, researcher has used the sample of 30 doctors working in government and private hospitals located in Mumbai. Snow ball sampling is used to collect data from doctors from government and private hospitals. The sample of 50 patients of government and private hospitals is undertaken to find out their satisfaction in respective hospital they have visited. Convenient sampling is used to collect data from patient located in Mumbai. Validated scale on work engagement is used to identify work engagement level. Validated scale also used to measure patient satisfaction level among patient in Mumbai. Many Indian and abroad literature reviewed under the current study.

### OPERATIONAL DEFINITION

1. Work Engagement: It is state of mind categorised into vigour, absorption and dedication.
2. Doctors: Doctors working in government hospitals.
3. Public Hospital: The hospitals which run or owned by public authorities.
4. Private Hospital: The hospitals which are run or owned by private entities/authorities.
5. Patient: Individuals who have been into either public or private hospitals for any medical problem.

### OBJECTIVES

1. To study work engagement level among doctors working in government and private hospitals in Mumbai.
2. To compare work engagement level among doctors working in government and private hospitals in Mumbai.
3. To study the impact of work engagement level among doctors on patient satisfaction.

### HYPOTHESIS

1. There is no significant relationship between work engagement of doctors and type of hospitals.
2. There is no significant relationship between patient satisfaction level and type of hospitals.
3. There is no significant relationship between work engagement of doctors and patient satisfaction level.

### RESEARCH DESIGN

1. Primary data is collected through structured questionnaire. Validated scales on work engagement is used to collect data from doctors working in government hospitals in Mumbai.
2. The sample size of 30 doctors is considered under current research. Snow ball sampling will be used to collect data from medical practitioners.
3. The sample of 50 patients is taken under research. Convenient sampling is used to collect data from patients.

## SCOPE

The research study is limited to the hospitals located in Mumbai region only. The findings are applicable to only selected hospital considered under sampling.

## LITERATURE REVIEW

**Johannessen, K. A., & Hagen, T. P. (2014)** conducted a study to identify a factors that leads to physician to involve into dual practice which affects working of public hospital adversely. Researcher found that economics variable affects the decision of physician in practicing in two places. Good salary, non-monetary benefits, perk benefits present in public hospitals. **Prins, J. T., Hoekstra-Weebers, J. E. H. M., Gazendam-Donofrio, S. M., Dillingh, G. S., Bakker, A. B., Huisman, M., ... van der Heijden, F. M. M. A. (2010)**. carried out study in Netherlands on burnout and engagement among resident doctors. Researcher found resident doctors are highly engaged in their job which leads to less burnout in medical centre. Some of the respondents who are less engaged may lead to burnout and health care centre should take special care for them. **Amoaf, E., Hanbali, N., Patel, A., & Singh, P. (2014)**. examined factors which leads to burnout among doctors. Young age, gender, martial status, working hours, low appraisal are the predictors for burnout among doctors. **Ronald Burke Mustafa Koyuncu Lisa Fiksenbaum, (2009)** conducted study on gender difference in work experience, satisfaction and well being among physician in Turkey. The comparison done gender wise satisfaction, wellbeing and experience. Researcher found that female physician are less experienced, satisfied with their job than men physician. Both are found same on few categories such as job behaviour, work outcome, etc. **Tengilimoglu, D., Kisa, A., & Dziegielewski, S. F. (1999)** the patient satisfaction from public and private hospital in Turkey is analysed by the researcher. Accessibility is considered as one of the important variable for deriving patient satisfaction and then consumer perception towards service quality is considered. They found private hospitals deriving greater satisfaction comparing to public hospitals. **Tateke, T., Woldie, M., & Ololo, S. (2012)** under the study 5 public and 5 private hospitals considered under study to find out customer satisfaction in public and private hospitals. Perceived health status, expected service, consultation duration, technical competency, welcoming approach are determinants of patient satisfaction level.

## TESTING OF HYPOTHESIS (DESCRIPTIVE AND INFERRENTIAL ANALYSIS)

**Hypothesis Testing for  $H_0$**  : There is no significant relationship between work engagement of doctors and type of hospitals.

### Reliability

**Table 1: Reliability Statistics**

Cronbach's Alpha	N of Items
.830	17

Table 1 explain the value of Cronbach's Alpha is more than 0.70 that is 0.830 which states the strong internal consistency of all responses.

**Table-2: Frequency Table**

		TYPE_OF_HOSPITAL			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private	15	50.0	50.0	50.0
	Government	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

Table 2 explain the sample size considered under the study, data from 15 public and 15 government hospitals were taken into the consideration for present study.

Table 3: AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-35	6	20.0	20.0	20.0
	36-45	15	50.0	50.0	70.0
	45 AND ABOVE	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

Table 4 : GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	25	83.3	83.3	83.3
	Female	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

Table 3 and 4 explain demographic information about the sample.

Table no 5: Test for Normality of data:

		Type of hospital			
Combined Work Engagement	Private	Mean	Statistics	Std Error	
		Skewness	0.110815	0.580119	
		Kurtosis	0.596528	1.120897	
	Value of Skewness / Std Error		0.191021		
	Value of Kurtosis / Std Error		0.532188		
Combined Work Engagement	Government	Mean	Statistics	Std Error	
		Skewness	0.170517	0.580119	
		Kurtosis	2.184	1.120897	
	Value of Skewness / Std Error		0.293935		
	Value of Kurtosis / Std Error		1.94844		

Table no 5 explain the value of skewness and Kurtosis which is 0.191021 and 0.532188 for private hospitals respective. The value of skewness and Kurtosis for government hospitals is 0.293935 and 1.94844 for private hospitals respective. Both the values are less than 1.96 which indicates that the data is normally distributed and parametric test can apply for further analysis.

Table 6: Group Statistics

	TYPE_OF_HOSPITAL	N	Mean	Std. Deviation	Std. Error Mean
Combined_WE	Private	15	4.1843	.39826	.10283
	Government	15	4.0118	.27429	.07082

Table 7 : Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	T	Df
Combined_WE	Equal variances assumed	.949	.338	1.382	28
	Equal variances not assumed			1.382	24.842
	Independent Samples Test				
	t-test for Equality of Means				

		Sig. (2-tailed)	Mean Difference	Std. Error Difference
Combined_WE	Equal variances assumed	.178	.17255	.12486
	Equal variances not assumed	.179	.17255	.12486

Interpretations: As the data is normally distributed (refer table no 5 ), Independent Sample T test is used to develop the relationship between type of hospitals and doctors. As the Significance value (i.e P value) is more than 0.05 i.e 0.178. We fail to reject our null hypothesis.

P Value > 0.05 (Level of significance). Researcher concludes that there no significance relationship between types of hospitals and work engagement of doctors.

### Hypothesis Testing: (Descriptive and Inferential)

**H<sub>02</sub>** : There is no significant relationship between patient satisfaction level and type of hospitals.

Table 8: Reliability Statistics	
Cronbach's Alpha	N of Items
.971	24

As the value of Cronbach's Alpha is more than 0.70 that is 0.971 which states the strong internal consistency of all responses.

Table 9 : Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	26	52.0	52.0	52.0
	Female	24	48.0	48.0	100.0
	Total	50	100.0	100.0	

Table 10 Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-25	8	16.0	16.0	16.0
	26-35	23	46.0	46.0	62.0
	36-45	7	14.0	14.0	76.0
	46-55	8	16.0	16.0	92.0
	56 and above	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

Table 11: Visited hospital					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Government	25	50.0	50.0	50.0
	Private	25	50.0	50.0	100.0
	Total	50	100.0	100.0	

Table 12 : Test for Normality of data:

Overall Satisfaction	Type of hospital			
	Private	Mean	Statistics	Std Error
		Skewness	0.133796	0.463684
	Value of Skewness / Std Error	Kurtosis	1.215182	0.901721
	Value of Kurtosis / Std Error		0.288549961	
			1.347625263	
	Type of hospital			
Overall Satisfaction	Government	Mean	Statistics	Std Error
		Skewness	0.430548	0.463684

		Kurtosis	0.901721	1.120897
	Value of Skewness / Std Error		0.928537538	
	Value of Kurtosis / Std Error		0.804463746	

Table no 12 explain the value of skewness and Kurtosis which is 0.288549961 and 1.347625263 for private hospitals respective. The value of skewness and Kurtosis for government hospitals is 0.928537538 and 0.804463746 for private hospitals respective. Both the values are less than 1.96 which indicates that the data is normally distributed and parametric test can apply for further analysis.

**Table 13: Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	T	Df
Overall Satisfaction	Equal variances assumed	31.407	.000	-8.719	48
	Equal variances not assumed			-8.719	32.773

**Independent Samples Test**

		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
Overall Satisfaction	Equal variances assumed	.000	-1.11333	.12769
	Equal variances not assumed	.000	-1.11333	.12769

Interpretations: As the data is normally distributed (refer table no 12 ), Independent Sample T test is used to develop the relationship between type of hospitals and doctors. As the Significance value (i.e P value) is more than 0.05 i.e 0.00 Hence researcher reject null hypothesis. P Value > 0.05 (Level of significance). Researcher concludes that there is significance relationship between types of hospitals and overall satisfaction among patients. **Hypothesis Testing: (Inferential)**

**H<sub>03</sub>:** There is no significant relationship between work engagement of doctors and patient satisfaction level.

#### Impact of Work Engagement on Patient Satisfaction Level:

**Tale 14: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.149 <sup>a</sup>	.022	.013	.69304

As the value of Adjusted R Square 0.13, it indicates that the co-relationship between work engagement and Patient satisfaction level is very low. The remaining 0.87 patient satisfaction is coming from other factors other than work engagement level of doctors working in private and public hospitals. Hence, researcher concludes that there is no significant relationship between work engagement and Patient satisfaction level.

**Table 15: ANOVA<sup>a</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.305	.305	.636	.432 <sup>b</sup>
	Residual	13.448	.480		
	Total	13.754			

As the P value (0.432) is more than significant value is more than 0.05, researcher accept null hypothesis and conclude that there is no significant relationship between work engagement and patient satisfaction level.

## CONCLUSION

The current research concludes that the work engagement level among doctors working in public and private hospitals does not depend on the type of hospitals where they are working. The satisfaction level of patients is depend upon the types of hospital they visit for their treatment. The overall satisfaction level of patient is depend upon the work engagement level among doctors working in government and private hospitals. R value in Anova analysis is 0.13 which indicate that work engagement of doctors only explains 13% relationship on patient overall satisfaction and remaining 87% of the satisfaction is coming from other factors other than work engagement among doctors in public and private hospitals.

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## Food Insecurity with Special Reference to Income and Expenditure Pattern of Households in Selected Village in Thiruvallur District, Tamilnadu

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### ABSTRACT

*Food security is when a person is able to obtain a sufficient amount of healthy food on a day-to-day basis. People who do not consume enough food each day suffer from food insecurity, which is when a person is unable to obtain a sufficient amount of healthy food on a day-to-day basis.*

*Poverty easily coexists with food insecurity and is the main cause of hunger and malnutrition. Although urbanization is increasing, the poor are still mainly in the rural areas. An estimated 7.3 million people move into the rapidly growing urban areas of India every year.*

*The causes of existing food insecurity can be better viewed under three concepts namely the: 'traditional concept' which includes factors such as unavailability of food and poor purchasing capacity; 'socio-demographic concept' which includes illiteracy, unemployment, and overcrowding, poor environmental conditions.*

### INTRODUCTION

India is a country of its people, being the world's largest democracy. Indians have had freedom of speech, religion, and the press ever since their constitution was adopted on January 26, 1950. Within this democracy people still live everyday being food insecure. "Food insecurity exists when all people, at all times, do not have physical and economic access to the sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." Poverty easily coexists with food insecurity and is the main cause of hunger and malnutrition. Poverty exists when there is lack of income, productive malnutrition, illiteracy, homelessness, inadequate housing, unsafe environment, social discrimination, and many more factors. More than 850 million people all over the world live everyday being food insecure. One in seven people live with a problem that can be fixed. "Malnutrition not only denies people their right to health; it also has serious economic implications. Malnourished children are less able to concentrate in school, and malnourished adults are less able to work effectively – thus undermining productivity and economic growth." Although urbanization is increasing, the poor are still mainly in the rural areas. An estimated 7.3 million people move into the rapidly growing urban areas of India every year. Though the number of middle class citizens is growing, there is an extreme gap between the rich and poor. Around 35 percent of the population is living below the poverty line. The growing population is over straining natural resources.

### OBJECTIVES OF THE STUDY

The major aim of this is to examine the performance in food security in India along with some concerns relating to food security in respect of the following:

1. To assess the income pattern of selected households in village,
2. To analyze the expenditure pattern of households,
3. To find out food intake and health,
4. To assess the Reasons for declining the production and per capita availability of food grains.
5. To assess the ways to improve global food security

### FOOD SECURITY IN INDIA

Since the advent of the Green revolution in the early-'70s, the country has avoided famine even during adverse weather conditions.

India has become self-sufficient in food grains during the last thirty years because of a variety of crops grown all over the country.

## METHODOLOGY

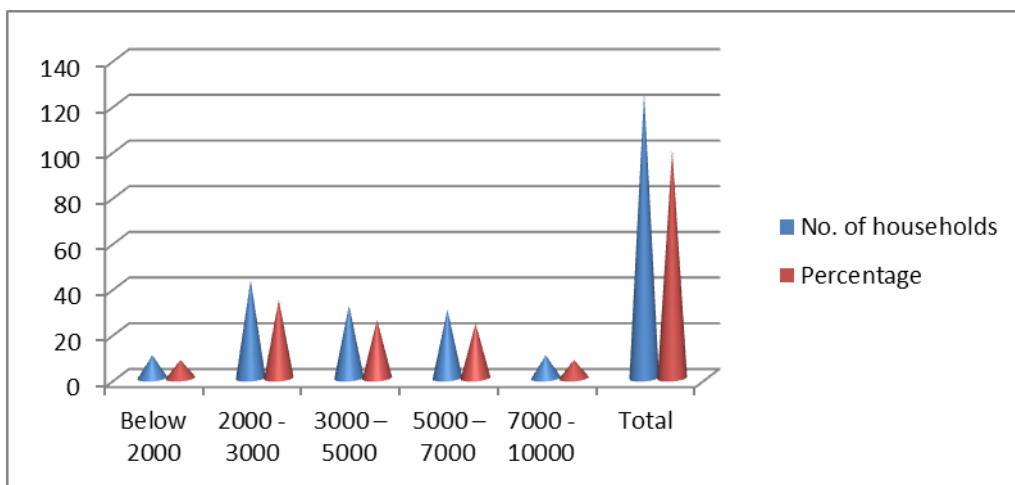
The data for this study were collected through primary and secondary data sources. Primary data were collected through interview schedule. Secondary data were collected from internet, books, magazines and journals in order to know theoretical background of this area.

The area of the present study is killikodi panchyat , Tamilnadu state, which is situated in thiruvallur district, ponneri taluk. Totally 100 respondents were selected from this village by using simple random sampling method.

## ANALYSIS AND INTERPRETATION

Income Range	No. of households	Percentage
Below 2000	10	8
2000 -3000	43	34.4
3000 – 5000	32	25.6
5000 – 7000	30	24
7000 - 10000	10	8
Total	125	100

Source : primary data

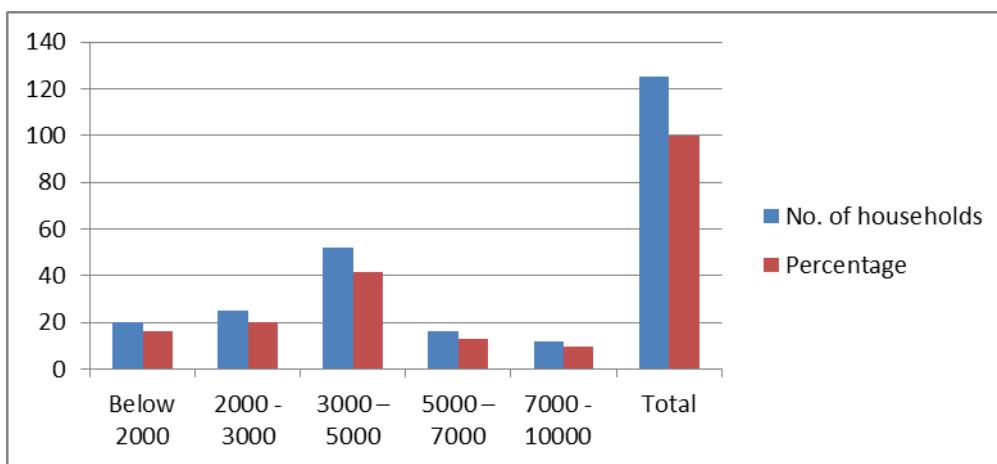


The above table and figure shows that 8% of the respondents come under the income group between Rs. 2000, and between 7000 and 10000. 24% of the respondents come under the income group between Rs. 5000 -7000.

## EXPENDITURE OF FOOD ITEMS

Expenditure Range	No. of households	Percentage
Below 2000	20	16
2000 -3000	25	20
3000 – 5000	52	41.6
5000 – 7000	16	12.8
7000 - 10000	12	9.6
Total	125	100

Source: Primary data



The above table reveals that 20% of the respondents to expenditure of food items between Rs 2000-3000. 41.6% of the respondents to expenditure of food items between Rs.3000 – 5000.

## REASONS FOR DECLINING THE PRODUCTION AND PER CAPITA AVAILABILITY OF FOOD GRAINS.

- The performance food grains production provides negative growth rate. These several factors which have great impact on food grain production. These are:
- Rapid growth of population in India at the expense of growth rates of food grains.
- The increase in the price of crude oil and devaluation of U.S. Dollars led to increase in food prices in INDIA as well as all over the world. Commercialization of agricultural products during the era of globalization has decreased the production of food grains. Due to liberalisation and globalization, the production of food grains is considered as unprofitable in India.
- Rapid urbanization and industrialization in India have led to encroaching of the agricultural lands.
- Because of unscientific, unsystematic and excessive use of chemical fertilizers, fertility of land has been reducing day by day
- Exploitation of ground water because of agricultural, industrial and domestic use also creates critical situation for food grain production.
- Food security is directly or indirectly related to climate change. Any alteration climate parameters such as temperature and humidity which govern crops growth will have direct impact on the quality of food produced indirect linkages pertain to catastrophic events such as floods and droughts which are projected to multiply as consequences of climate change leading to huge crop loss and leaving large patches of arable land unfit for cultivation and hence threatening food security.

## WAYS TO IMPROVE GLOBAL FOOD SECURITY

1. Close the yield gap. By 2050, 120 million hectares of natural habitats will be converted to farming in developing countries, the World Wildlife Fund estimates.
2. Use fertilizer more efficiently.
3. Raise low water productivity.
4. Target food for direct consumption.
5. Reduce food waste.

## CONCLUDING OBSERVATIONS

India achieved success in combating transient food insecurity caused by droughts or floods, in miserably failed to make much dent in chronic food insecurity as reflected in the low energy intake and high incidences of malnutrition. The overall improvement in nutritional status has also been very slow. There is chronic under-nourishment in about half of the population, particularly among the vulnerable groups of children, women and elderly from the lower half of the expenditure classes. Curiously, the proportion of consumption expenditure

spent on food is slowly going down even in the households with chronic under-nourishment. Under nourishment in the bottom 30% of the expenditure class is alarming. And even the middle 40% is not free from it. The mounting food stocks miserably failed to banish mass under-nourishment. To sum up a majority of the households spent fewer amounts of nutritional items; because the household's income is low the nutritional status not only depends on the income and also depends on family size of the holds. So the government policies and introduction of new poverty eradication scheme may be help for achieving success in this of social reconstruction and development.

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## Problems faced by Transgender with reference to physical health care

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### ABSTRACT

*Transgender individuals has to undergo the problems like harassment, discrimination, and rejection within our society. Lack of awareness, knowledge, and sensitivity in health care centers eventually leads to insufficient availability to, underutilization of, and disparities within the health care system for this population. Primary survey, web material and reference of journals are used as research tools. Substance abuse, lack of self hygiene, prevalent of sexually transmitted disease, financial crisis such problems exist. These patients to be taken care and managed by a specialty team, obstetrician–gynecologists should be prepared to assist or consult transgender individuals with routine treatment and screening as well as hormonal and surgical therapies. Obstetricians and Gynecologists opposes discrimination on the basis of gender identity and recommend public and private health insurance plans to cover the treatment of gender identity disorder.*

### OBJECTIVE

- To study, problems faced by transgender in everyday life related to physical health.
- Improve the health, safety, and well-being of transgender individuals.

### RESEARCH METHODOLOGY

- Primary Data :- Surveyed 30 transgender and collect information from vitthalwadi area.
- Secondary Data:- Web source ,Journals

### INTRODUCTION

In the Indian subcontinent, *transgenders* are eunuchs, intersex people, and transgender people. Also known as *Aravani*, *Aruvani*, *Jagappa*, or *Chhakka*, this community in India prefer to call themselves *Kinnar* or *Kinner*. This is with reference to the mythological beings that excel at song and dance. In Pakistan, they are called *Khawaja Sira* - equivalent for transgender in Urdu language.

*Transgenders are neither completely male nor female* They are officially recognized as third gender in countries in the Indian subcontinent. Transgenders have a recorded history in the Indian subcontinent from antiquity onwards as suggested by the Kama Sutra period.

Many *Transgenders* live in well-defined and organised all-*transgenders* communities, headed by a guru. These communities have consisted over generations of those who are in poverty, rejected by, or flee, their family of origin. Many work as sex workers for survival. In general Transgender are born male, only a few having been born with intersex variations. Some Transgenders undergo an initiation rite into their community called *nirwaan*, involves the removal of the penis, scrotum and testicles.

### STATE STATS

State	No. of third gender persons ('000s)
Uttar Pradesh	137
Andhra Pradesh	44
Maharashtra	41
Bihar	41
West Bengal	30
MP	30
Tamil Nadu	22
Odisha	20
Karnataka	20
Rajasthan	17
INDIA	488



Transgender people face several health issues as well as stigma, discrimination, and lack of access to quality care. Some health issues include an increased risk of HIV infection, especially among transgender women of color, and lower likelihood of preventive cancer screenings in transgender men. People of any sexual orientation can face health problems. But transgender may be at greater risk for health problems because they don't always see a healthcare provider when they need to. It may be that they feel embarrassed, have had a bad experience, fear judgment, or have a healthcare provider who is uninformed.

## **HORMONE ISSUES**

While transitioning, you may take hormones to achieve masculine or feminine effects. Those hormones carry risks:

- Low or high blood pressure
- Blood clots
- Dehydration and electrolyte imbalance
- Liver damage

Sometimes, a transgender person buys hormones from a nonmedical provider. This may be because the therapy isn't covered by insurance. Or it could be because the person doesn't want to seek medical care. This can result in taking the wrong amount of the hormone and may increase the chance for side effects. To limit the risks, a healthcare provider should closely watch hormone therapy.

## **CANCER**

Transgender people are at a slightly higher risk of developing cancer tied to hormone use. Depending on the stage of transition, the breasts, uterus, ovaries, prostate, or liver can be affected.

Appropriate screenings including prostate, breast, and pelvic exams should be a part of routine health care. Although you might face challenges dealing with healthcare issues, don't delay or skip these exams. Not getting preventive screening could result in a delay in the diagnosis and treatment of any cancer.

## **MENTAL HEALTH ISSUES**

Gay, lesbian, and transgender people often have mental health issues as they struggle to identify with their sexuality. You may have a hard time sharing such personal information with family and friends. You may worry about how loved ones will react. Or you may feel lonely because you don't want to tell anyone, even those close to you. You may feel depressed or anxious because of this lack of support or acceptance from friends and family. Work can also trigger these issues. But if you don't seek treatment, your risk for suicide increases.

## **SEXUALLY TRANSMITTED INFECTIONS**

Sexually transmitted infections (STIs) include human papillomavirus (HPV), hepatitis A and B, HIV, syphilis, chlamydia, and gonorrhea. Most STIs can be treated, but some can be fatal. They can affect people no matter what their sexual orientation is. Certain gay, lesbian, and transgender people may not want to practice safe sex. And some have lifestyles that increase their risk. Practicing safe sex can limit your chances of getting or passing on an STI. Seek prompt medical care at the first sign of symptoms. Don't put off a visit to the healthcare provider because you are embarrassed or fear judgment.

## **SUBSTANCE ABUSE**

Transgender people often have substance abuse problems. These include tobacco, alcohol, and illegal drugs. The reason may be partly that people in this group face challenges as they strive to find their place in society.

## **HEART DISEASE**

Obesity, smoking, hormone use, and high blood pressure are common among transgender people. These factors put a person at risk for heart disease, heart attack and stroke. You should get regular checkups to help prevent heart disease. Also control health conditions like high blood pressure and obesity, and live a healthy lifestyle.

## **OBESITY**

An unhealthy body weight can contribute to a number of health problems. These range from heart disease to depression. A healthy lifestyle should be a part of any gay, lesbian, or transgender person's daily routine. Try to get regular exercise and follow a healthy diet to get to and maintain a healthy weight.

Be aware of your increased risk for health problems because of your sexual orientation. Set up a good relationship with a healthcare team to help keep you in good physical and mental health.

Eliminating Transgender health disparities and enhancing efforts to improve their health are necessary to ensure that they can lead long, healthy lives. The many benefits of addressing health concerns and reducing disparities include:

- Reductions in disease transmission and progression
- Increased mental and physical well-being
- Health care availability at reasonable costs
- Increase in life expectancy
- Collecting data in health-related surveys and health records in order to identify transgender health disparities
- Appropriately inquiring about and being supportive of a patient's sexual orientation and gender identity to enhance the patient-provider interaction and regular use of care
- Providing medical students with training to increase provision of culturally competent care
- Providing supportive social services to reduce suicide and homelessness among youth
- Curbing human immunodeficiency virus (HIV)/sexually transmitted infections (STIs) with interventions that work.

## REVIEW OF RELATED LITERATURE

This chapter provides a review of studies pertaining to all aspects relevant to the present study to get a better understanding of the variables included in the study. The studies are classified in the following sequence to get a clearer picture: Psychosocial problems of transgender, Health and HIV risk in transgenders.

## PSYCHOSOCIAL PROBLEMS OF TRANSGENDERS

### Studies on psychosocial problems in youth

Melchior, Huba, Schneir, Radzik, Belzer and Panter (1999) compared the psychosocial characteristics, risk factors, and service needs of youth based on a combination of gender, orientation, and transgender status as well as HIV serostatus in 142 individuals enrolled in services at an HIV risk reduction clinic for adolescents and young adults. Transgender clients were significantly more likely to have precarious housing situations, to have run away from home due to sexual, physical, or verbal abuse than members of other Gender/Sexual Orientation groups. Print to PDF without this message by purchasing novaPDF (<http://www.novapdf.com/>)

29 The GLSEN 2001 National School Climate Survey showed that almost two-thirds of LGBT youth reported having been sexually harassed during the past school year. The frequency of sexual harassment was higher for female and transgender youth in the sample. Transgender youth were also significantly more likely to report feeling unsafe in school because of their gender expression. Factors that affect the experiences of transgender youth were explored by Grossman and D'Augelli (2006) using three focus groups. Three themes emerged from an analysis of the groups' conversations. The themes centred on gender identity and gender presentation, sexuality and sexual orientation and vulnerability and health issues. Most of them reported feeling they were transgender at puberty and experienced confusion and negative reactions to their gender atypical behaviours. The four problems they noted related to their vulnerability in health areas were: the lack of safe environments, poor access to physical health services, inadequate resources to address their mental health concerns, and a lack of continuity of caregiving by their families and communities. Grossman and D'Augelli (2007) studied the risk factor of suicide among transgender youth. Nearly half of the sample reported having seriously thought about taking their lives and one quarter reported suicide attempts. Factors significantly related to having made a suicide attempt included suicidal ideation related to transgender identity; experiences of past parental verbal and physical abuse; and lower body esteem, especially weight satisfaction and thoughts of how others evaluate the youths' body. Kosciw, Greytak, Diaz and Bartkiewicz (2009) found in a survey, of more than 7,000 lesbian, gay, bisexual and transgender (LGBT) middle and high school students aged 13–21 years, that over 85% of trans students reported verbal harassment based on their sexual orientation and gender identity. Nearly half (49.5%) reported physical harassment based on these characteristics, and a one third (34.1%) reported being physically assaulted. Transgender students get harassed much more often than their classmates. Harris (2005)

found that transgender students were over four times more likely to be verbally harassed because of their gender expression. Greytak, Diaz and Kosciv (2009) in their report entitled 'Harsh Realities' show that the grade point averages of transgender students who were frequently harassed were significantly lower than those who were bullied less often. Trans students who regularly experienced harassment based on their sexual orientation had an average GPA of 2.2, compared with a GPA of 3.0 for trans students who were never or rarely harassed. By contrast, frequently harassed LGBT students as a group had an average GPA drop of four points. Bullying and harassment is twice as detrimental to transgender students as it is to their lesbian, gay and bisexual peers. Mustanski, Garofalo and Emerson (2010) sought to address some of the gaps in past research by conducting structured diagnostic interviews in a community-sample of 246 LGBT youth. Participants in the study were very diverse in terms of ethnicity and were between the ages of 16-20 years old, with an average age of 18. It was found that nearly 10% of study participants met criteria for post-traumatic stress disorder (PTSD) and about 15% met criteria for major depression. A third of the participants had made a suicide attempt at some point in their life.

## HEALTH AND HIV RISK IN TRANSGENDERS

Bockting, Rosser and Scheltema (1999) implemented and evaluated a transgender HIV prevention workshop, grounded in the Health Belief Model and the Eroticizing Safer Sex approach, combined lectures, videos, a panel, discussion, role-play and exercises. Evaluation using a pre-, post- and follow-up test design showed an increase in knowledge and an initial increase in positive attitudes that diminished over time. The findings suggested an increase in safer sexual behaviors such as (mutual) masturbation. Peer support improved significantly. The GLBT Health Access Project (2000) aimed to improve the health care received by transpeople by exploring what a TG/TS person experiences when she/he seeks health care. The study asked participants in four focus groups to report on their experiences in obtaining routine health care as well as specialty services, and to discuss their health insurance status. The adult MtF group saw substance abuse treatment and HIV/AIDS care as being the key issue. The MtF adult group said that endocrinology, mental health and primary care were their most important health care needs. In all the focus groups, a constant theme was a perception of vast provider ignorance of transpeople and concerns. From the level of health care systems down to individual providers and frontline staff, transgenders reported provider unawareness of, disrespect toward, and outright refusal of treatment for their health needs, both basic and trans-related. Clements-Nolle, Marx, Guzman and Katz (2001) described HIV prevalence, risk behaviors, health care use, and mental health status male-to-female and female-to-male transgender persons and determined factors associated with HIV. 392 male-to-female and 123 female-to-male transgender persons were interviewed and tested for HIV where the prevalence among male-to-female transgender persons was 35%. Among FtM transgenders, HIV prevalence (2%) and risk behaviors were much lower. Most male-to-female (78%) and female-to-male (83%) transgender persons had seen a medical provider in the past six months. Sixty-two percent of the male-to-female and 55% of the female-to-male transgender persons were depressed; 32% of each population had attempted suicide. In depth face-to-face interviews were carried out with 15 mak nyah respondents from five major towns. According to Teh (2008), the HIV problem among the mak nyah sex workers and their clients is critical. Many do not have in-depth HIV/AIDS knowledge and do not practice safe sex. The problem gets worse when most mak nyah do not consider HIV/AIDS as a primary concern because of other pressing problems like employment and discrimination. There are also no HIV prevention activities in many parts of Malaysia. Mak nyah also face constant harassment from enforcement authorities for prostitution. Waddle (2008) addressed the current barriers to health care from the perspective of the transgender population in the Sacramento area. Thirty four transgender participants, eighteen years of age or older, were surveyed about their experiences when utilizing health care services. FtM were found to have significant amounts of barriers to access of culturally competent health care than the MtF population. It was found that the participants more often did not receive information about health care through friends, support groups, and internet sites and were less likely to obtain information from practitioners, participants also found that there was a lack of information when they accessed healthcare and 59% responded that they experienced a general lack of understanding of transgender,

## FINDINGS

With reference to primary survey, following details depicts that transgenders are such a sexual minority community which faces less concern towards the health issues such as:

- Transgender are less concerned about self hygiene, cleanliness and its importance

- Transgenders are the human minority do not get proper access to diagnosis of physical diseases. Their is reluctance of health concern and diagnostic test at advance level.
- Transgenders are more prone to get infected by HIV. Since there is less awareness among the minority section with respect to prevention during sexual contact, highest percentage of their population is HIV positive.
- Transgenders are found substantially abused. They use addictive substances such as alcohol, cigrattes, heroine and other drugs.
- There is no special facility to these sexual minority section in terms of concession in medicine prices, availability of special medical facility .

## CONCLUSION

Framing a body to provide the basic knowledge regarding the importance of health care. Periodical medical check up must be mandatory.

1. Lack of knowledge may manifest as assumed complexity of knowledge needed along with report of anxiety regarding uncertainty. Identify solutions to overcome the knowledge gap.
2. Strategies must be framed to make them aware of preventive measures from disease such as HIV.
3. Determine the degree to which transgender impedes access. Determine change needed to overcome the financial problems to avail health care.
4. Evaluate other problems including societal stigma, mental health issue among patients, and socioeconomic issues that represent hindrance to transgender for receiving high quality care.
5. Implement medical insurance plan by public and private medical facility providers.

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## The Role of Employer Branding for Organizational Effectiveness in Healthcare Sector

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### ABSTRACT

*Employer branding is the most important activity for any organisation to overcome the challenges in rapidly changing and turbulent work environment. In current scenario, many organizations around the world are using Employer Branding strategies, in order to become 'employer of choice', as a result, to attract, and retain the talented and knowledgeable workforce available in the labour market. It is an intricate concept which includes many factors namely recruitment, communication, performance and development, company's reputation, work environment and so on. In today's business environment the scope of employer branding is essential for organizational effectiveness and competitive advantages. This purpose of this study is to understand the importance of employer branding in healthcare sector. This study attempts to explore the perception of employees about employer branding and the factors influencing the employees' perception of employer branding in healthcare sector.*

*Keywords: Employer Branding, Perception of employees', Healthcare sector.*

### INTRODUCTION

In today's volatile business environment, the need for HR managers to develop strategic tools is imperative due to the growing prominence and rising cost of human capital. Besides, there is a realization among the top managers that the HR Managers should play a proactive and innovative role in achieving the desired level of organisational effectiveness and success. Organizations all around the world always try to hire those people who can be an asset for the organization but it is important to know the efforts of these organizations to become employer of choice. Employer branding has a significant role for the hiring of human capital. Employer branding creates its own identity and manages the organization's image relatively in a new way, differentiates it as an employer from their opponents, and offers all the facilities to its employees to stay with them. This creates an emotional relationship between the employer and employee, and makes the brand live in the minds of its stakeholders and its employees.

The image of the employer brand is purely reflected through the stakeholder's perception and the potential employees of the present organization. Effectiveness of employer branding is surviving as a drive for the progressive retention and recruitment. The effectiveness of employer brand is playing a vital role regarding the organisations market perception. So it is crucial for the existence of the organization that the employer brand has to be promoted in an efficient way. So that the Healthcare sector and the organization have to be put win over the edge of the competitive advantage.

### REVIEW OF LITERATURE

**Kristin Backhaus and Surinder Tikoo (2004)** Employer branding represents a firm's efforts to promote, both within and outside the firm, a clear view of what makes it different and desirable as an employer. In recent years employer branding has gained popularity among practicing managers. Given this managerial interest, this article presents a framework to initiate the scholarly study of employer branding. Combining a resource-based view with brand equity theory, a framework is used to develop testable propositions. The article discusses the relationship between employer branding and organizational career management. Finally, it outlines research issues that need to be addressed to develop employer branding as a useful organizing framework for strategic human resource management in all sectors.

**Evans Sokro (2012)** The prime purpose of this study was to investigate whether employers use branding in their organisations, and how employer branding influence the attraction and retention of employees in the service sector in Ghana. The descriptive survey design was adopted for the study. Eighty-seven employees, including junior and senior staff were conveniently sampled for the study. Data was analyzed using both descriptive and inferential statistics. The results of the study suggest that organisations use employer branding processes in their business to attract employees and customers. It was also found that brand names of

organisations may significantly influence the decision of employees to join and stay in the organisation. It was therefore suggested that employers need to create conducive work environment with conditions to enable employees feel comfortable and remain in the organisation.

## STATEMENT OF THE PROBLEM

This study inquire into the perceptions of various categories of employees towards employer branding in healthcare sector so as to identify the factors that determine the existing level of employer branding for the select healthcare organizations in Tiruchirappalli District.

## SCOPE OF THE RESEARCH

The present study discusses the Employer Branding for healthcare organization in Tiruchirappalli. It mainly focuses on the employees' perspective of Employer Branding. Thus this study portrays the view point of employee towards Employer Branding, and the factors influencing the employees' perception of employer branding in healthcare sector.

## OBJECTIVES

1. To study the perception of employees about employer branding in healthcare sector.
2. To study the factors influencing the employees' perception of employer branding in healthcare sector.

## METHODOLOGY/RESEARCH DESIGN

The research was designed to determine the employee's perception of employer branding in healthcare sector organizations. Primary data were collected from healthcare employees in the city of Tiruchirappalli through well-structured questionnaire. The sample size is 50. The collected data are analysed and interpreted by using statistical tools like simple percentage analysis, mean, standard deviation and ANOVA.

## ANALYSIS AND INTERPRETATIONS OF THE STUDY

### Perception of Employees on Employer Branding Dimensions

#### Rank order of dimensions and priority chart

Various dimensions	N	Mean	Mean Rank
Internal values proposition	50	4.41	2
Brand Positioning	50	4.47	1
Employee attraction	50	4.39	3
Employee satisfaction	50	4.27	4
Employee commitment	50	4.15	5
Performance Appraisal	50	4.06	7
Reward and Recognition	50	4.13	6

Source: Primary Data

It is clear from the above analysis that highest scoring dimension is Brand Positioning with the mean score of (4.47), followed by Internal Value Proposition (4.41) , Employee Attraction (4.39), Employee satisfaction (4.27), Employee Commitment (4.15), Reward and Recognition (4.13) and Performance Appraisal (4.06).

Overall employer branding scores the mean value of 4.268 out of the maximum possible score of 5.

The above mentioned analysis and the dimensions relating to perception of employees' regarding Employer Branding in healthcare organizations showed that respondents from study units having a positive impact over the overall employer branding. Thus the percent of high level opinion employees in more for this dimensions.

### Result of ANOVA for factors influencing the employees' perception of Employer branding in health care sector.

FACTORS	N	MEAN	STDEV	F	Sig
Internal value proposition	50	4.52	0.60	20.057	.000*
Brand Positioning	50	4.40	0.52	10.617	.000*
Employee attraction	50	3.45	5.883	45.431	.000*
Employee satisfaction	50	4.29	0.66	22.577	.000
Employee commitment	50	3.38	1.10	10.895	.000
Performance Appraisal	50	3.97	0.80	30.386	.000*

Reward and Recognition	50	4.12	0.63	58.884	.000
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*\*5% Level of significance*

*Source: Primary Data*

According to the results of ANOVA test the factors namely, 'Internal value proposition', 'Brand Positioning', 'Employee attraction', 'Employee satisfaction', 'Employee commitment', 'Performance Appraisal' and 'Reward and Recognition' have a significant influence on the employees' perception of Employer Branding in healthcare sector.

## SUGGESTIONS

- The employee perception about overall employer branding is high in healthcare sector.
- Work place that offer opportunities for growth also make it easier for employers to attract and retain employees. It is important for healthcare organizations to be able to retain talents to enable them become efficient and effective.
- Work environment that is socially rich and psychologically empowering is also needed for organizations to be ahead of competition.
- Employee retention is one of the most important elements of success in any business, and this might be even truer for IT sector.

## CONCLUSION

Employer branding helps to increase performance of the organization and helpful in achieving success for the organization. It is also an emotional attachment between an employer and employee. This study is proposed to contribute the growing body of knowledge by addressing the issue of which functional aspects of employer brand attributes need to emphasize by healthcare sector in order to achieve a positive representation of the employer brand personality and eventually attract prospective applicants to work with them.

## HR Analytics Essential for Driving Organizational Performance in Healthcare Sector

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### ABSTRACT

*The Human Resource Management is the major asset of the organization. Human Resource is considered as an important element in service industry in general and in specifically in healthcare sector. In today's business environment, the scope of HR practices in health care sector is to develop a new strategic partner for determining the organizational effectiveness. In this context, HR analytics plays a very important role in aligning the HR strategy with the overall business strategy. HR analytics supports the HR professionals to formulate the strategies which enable the organization to increase the efficiency of the organizations. The purpose of this study is to understand the importance of HR analytics in healthcare sector. This study attempts to explore the level of awareness and how HR analytics facilitate to improve the workforce performance in the healthcare sector*

**Keywords:** Healthcare, Analytics And Information Technology

### INTRODUCTION

In any sector innovation and excellence are two driving forces that steer the organization to the pinnacle of performance. The innovation ought to happen in every sphere of activities of an organization. The Human Resource Management of late has attracted the attention of the top management, for trying out innovative measures, due to the growing cost of HR management and palpable uncertainty associated with the measurement of return on HR investment. The human resource management has always been the major asset of the organization. Human Resource are considered as an important element in service industry in general and in specifically in health care sector.

HR analytics is the application of analytical tools to resolve HR issues in an organization. Due to the technological advancement, HR analytics has evolved as a critical HR tool and has changed the way of HR planning done within the organization. HR analytics supports the HR professionals to formulate the strategies which enable the organization to increase the efficiency of the workforce performance. HR analytics uses statistical tools and other techniques to analyse worker-related data, allowing HR leaders to develop the effectiveness of people-related decision-making and human resources strategy. HR analytics as a methodology for understanding and evaluating the causal relationship between HR practices and organisational performance outcomes.

As far as the healthcare sector is concerned the growth in the usage of HR analytics is appreciable and almost natural as the expansion of the healthcare industry. In healthcare sector they have generated huge data driven by record keeping and regulatory requirements in HR functions. HR analytics facilitates the workforce to understand the complexities of the employees working in the healthcare sector – how they are performing and increasing value of the healthcare services. HR analytics aids workforce in an organization to evaluate the relationship between HR practices and workforce performance outcomes, level of awareness and usage of HR analytics in healthcare sector.

### REVIEW OF LITERATURE

**Lukas (2016)** in this study the researcher focused on developing and enhancing the HR Analytics and HR business intelligence. Because a modern human resources department sets human resource key performance indicators, measures the performance of processes, publishes HR dashboards and tries to project the future using data from the past. HR analytics increase the productivity and importance of human resources and also focusses on the entire organisation and all business processes. The study explained how the analytics can help HR become better. HR Analytics is sustainable competitiveness of human resource which is based on the ability to predict future trends in the organisation, industry, and the nation. It is hard to predict changes on the country and industry level, so the introduction of HR predictive analytics is the sound basis for the elaboration of a competitive organisation.

**David Angrave and Mark Lawrence (2016)** this article explained the big data and the transformative potential of HR analytics. HR analytics will ensure HR's future as a strategic management function while transforming organisational performance for the better. It argued that unless the HR profession rises up to both the potential and drawbacks of this emerging field, and engages operationally and strategically to develop better methods and approaches, it is unlikely that existing practices of HR analytics will deliver transformational change. As a result of this study it may be used to inform HR practices and to develop meaningful day-to-day metrics, measures and dashboards within conventional HRIS analytics packages. Academics could play a constructive role in these developments, but could also do more to elucidate the praxis of strategic HR analytics.

## STATEMENT OF THE PROBLEM

This study mainly focus the impact of HR analytics in productivity and performance in the healthcare sector. The study explore the awareness of HR analytics practices and level of satisfaction of employees for usage of HR analytic in the healthcare services.

## SCOPE OF THE RESEARCH

The present study discusses the HR analytics practices in the healthcare sector in Tiruchirappalli. It mainly focuses on the employees' perspective of HR analytics practices. Thus this study portrays the view point of employee towards HR analytics practices, their level of awareness and usage of HR analytics practices in healthcare services.

## OBJECTIVES

1. To ascertain the level of awareness of healthcare sector employees about the utility value of HR Analytics Practice.
2. To identify the level of satisfaction of employees about HR analytics usage in healthcare sector.

## METHODOLOGY/RESEARCH DESIGN

The research was designed to determine the employee's perception of HR analytics practices in healthcare sector. Primary data were collected from healthcare employees in the city of Tiruchirappalli through well-structured questionnaire. The sample size is 50. The collected data are analysed and interpreted by using statistical tools like simple percentage analysis, mean, standard deviation and ANOVA.

## ANALYSIS AND INTERPRETATIONS OF THE STUDY

### Usage of HR Analytics Practice in Healthcare Sector:

PARTICULARS	N	MEAN	STDEV	RANK
Framing basic Human Resource reporting	50	4.45	.670	2
Doing accurate assessment of employee performance	50	4.41	.757	3
Managing the personnel information	50	4.53	0.689	1
Finding out the Human Resource needs in the organization	50	4.22	0.645	5
Helps in Decision making relating to HRM	50	4.37	.848	4

Source: Primary Data

The result of the table shows the mean score of statement 'Managing the personnel information' as 4.53 and hence top ranked. It is followed by the 'Framing basic Human Resource reporting' with the mean value of 4.45 and Doing accurate assessment of employee performance' with the mean value of 4.41. The next statement 'Helps in Decision making relating to HRM' in the bank is ranked as fourth, based on a mean value of 4.37 and 'Finding out the Human Resource needs in the organization' has secured fifth rank with a mean of 4.22 respectively.

As regarding the usage of HR Analytics practices in various functions is found to be an area where HR Analytics is optimally used.

The above-mentioned analysis and the dimensions relating to the usage of HR analytics in the healthcare sector showed that respondents from study units know clearly the usage for implementing HR analytics in healthcare sector and the impact it makes on the outcomes of HR functions. The responses from study units also revealed that they have obtained quite a high level of awareness about the utilities of HR analytics.

The scores connected with the usage of HR analytics show that the “The awareness and utility value of healthcare sector employees about the HR analytics practices.” with the mean score (4.396 out of 5). It shows that the respondents have high-level awareness about the usage of HR analytics.

## FUNCTIONAL PERSPECTIVE OF ANALYTICS IN HEALTHCARE SECTOR

### Result of ANOVA for HR Functional Perspective of Analytics:

FACTORS	N	MEAN	STDEV	F	Sig
Productivity and efficiency services	50	4.57	0.61	14.839	.000
HR information management	50	3.43	0.81	24.910	.000
Cost efficiency	50	3.56	0.	21.511	.000*

\*5% Level of significance

Source: Primary Data

According to the results of ANOVA test the three factors namely, ‘Productivity and efficiency services’, ‘HR information management’ and ‘Cost efficiency’ have a significant influence on the functional perspective of HR analytics. The results pertaining to the satisfaction level of the respondents clearly indicated that they have a higher level of satisfaction about usage of HR analytics in their organisations.

### Suggestions to the Healthcare Sector Employees to Improve the Efficiency and Effectiveness of the Services through HR Analytics:

Regarding the acceptance of the HR analytics, most of the respondents are satisfied with the usage of HR Analytics in the healthcare field. This indicates that the management of healthcare sector have optimally leveraged HR Analytics for interpreting HR data on almost real time need basis. The management can think of integrating HR Analytics with other core HR functions like Recruitment, Training and development, Compensation etc.,

The management should undertake awareness programmes among the employees of HR department on the importance of analytics. A similar programme can also be organised for the entire organisations so that the employees appreciate the benefits of analytics in improving the quality of HR services.

The organisations should ensure effective incentive schemes, suitable communication channel, system for data cleaning and integration and presence of trained analyst to ensure smooth and hassle free functioning of HR analytics.

## CONCLUSION

In the present business scenario technological advancements have great and decisive influence on the survival and competitiveness of organisations. Of late every business organization tries to get competitive edge for their organisations by adopting latest technology in management. These organizations now find HR as one of the core areas for implementing information technology in the form of analytics. HR analytics in healthcare is evolving into a promising field for providing insight from very large data sets and improving outcomes while reducing cost. The present study has been focused on the awareness and acceptance level of HR analytics in healthcare sector. The analysis of study revealed that HR analytics can enhance the productivity of the healthcare sector. The employees of the healthcare services perceive HR analytics as a facilitator in goal attainment. And also by using HR analytics tools and techniques in healthcare organizations can understand how these people-related factors can lead to business results and make informed decisions.

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## Towards a Dataist Utopia: Aesthetic Reconstructions, Medical Humanities and Posthumanism

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### ABSTRACT

From Theism to Humanism and to Dataism, the worldview through which social discourse is generated, is caught in a transition. Paul Kalanithi, a Stanford neurosurgical resident, in his memoir *When Breath Becomes Air*, reminisces about his shifting values as a medical practitioner suddenly faced with a terminal illness in his own body. This autobiography works as an ethnographical account where Kalanithi shifts from a tradition of medical inflation, where accounts are centred on heroism of the doctor, to the suffering body of the subject: "Science is based on reproducibility and manufactured objectivity...[and is] inapplicable to the existential, visceral nature of human life, which is unique...subjective and unpredictable." (124). The book works as capillary resistance to the habitual narcissism prevalent in the medical industry. The body of the patient is reduced to a machine or a factory of parts. The narrative of confronting disease as war is imperialist, reducing the body to a site, an object over which imperial powers battle to gain mastery. There is a shift of owning emotional capital, from the patient to the doctors who redistribute the capital in the medical industry, overwriting the patient's subjective experience. Medical humanities must work to temper the arrogance of an authoritative data-driven practice.

**Keywords:** medical humanities, dataism, healthcare, medicine, aesthetics, aesthetic reconstructions, south korea, humanism, posthumanism

### 1. INTRODUCTION

There is a pervasive psychosomatic anxiety that continues to grip human societies at large even as they have been ushered into the Fourth Industrial Age. This anxiety is by no means a recent phenomenon but rather consequent of what Julia Kristeva in *Powers of Horror* refers to as abjection, a subjective feeling of horror when confronted with one's "corporeal reality" that threatens all notions of the Self and the Other. Kristeva observes that the abject is characterized by a singular quality of being "opposed to the I" (*Powers of Horror* 001), the 'I' that is imbued with meaning. In amending the abject, as is abjection, aesthetic reconstructions bring into question issues of the bodily imaginary, a contemporary capitalist development of the medical and cosmetic industry, cultural hegemony, telic decentralization (David Bakan, 1968). and the grotesque body and medical control over subjects especially women. In the analysis of hegemonic cultural expression in context of a medical industry steeped in medical inflations and data-driven decision making, emerges the need to address the burgeoning of Dataism, touted as the religion of the future.

While inhabiting what Baudrillard terms as "integral reality" where a reality that achieves its fulfilment as it terminates an objective reality in which an imaginary persists, it is crucial to posit what the self is to be understood as. Additionally, in examining aesthetic reconstructions and the loom of Big Data's possibility to empower the Big Brother, the role of medical humanities in humanizing patient services and medical approach towards humans is in a state of dire peril.

### 2. HUMANISM AND THE SELF

Humanism is centred on the individual and what the individual feels. Yuval Noah Harari in *Homo Deus* elaborates on the shift from Theism, a worldview centred on God, to Humanism post Enlightenment. Questions of the Self have been debated without any conclusive revelation and neuroscientists continue to search for an answer. The Self is the centre of Humanist thought. The shifting concept of the Self is the first cause for inquiry into the operative capacity that the Humanist thought possesses in the era of the digital. The self can be understood in different ways, perhaps something as simplistic as an essence of an individual's personality. Or perhaps one can limit the narrative of the self as a physical entity located by the brain. Removed from this is another sense of self conceived in spiritual views of a metaphysical self that escapes spatial and temporal properties. And there also exists the epistemic notion of the self, a derivative of the Cartesian *cogito*. However, in this paper, the self that shall be referred to is the one developed on the basis of indexical knowledge, best

exemplified by the 1977 thought experiment by John Perry featuring the fictional character, Rudolf Lingens. Lingens, Perry notes, is an “amnesiac... lost in the Stanford library. He reads a number of things in the library, including a biography of himself” (*The Philosophical Review* 492), his causal history, his physical properties but it is a different kind of knowledge that he needs to self-locate Rudolf Lingens, to realise that he himself is Rudolf Lingens.

There has been an extensive privileging on the scientific to ‘physically’ locate the self and create what can be accepted as the legitimate account of truth. Even as indexicality attempts to note the self as a unique creation at a unique point of time that necessitates a unique body of self-knowledge, there exists a linguistic problem with the notion of the self: can a non-real entity make a real statement? In this tug between the scientific insistence of physical evidence and the semantic generation of the indexical self, one arrives at the discursive aporia of the Humanist worldview: the capitalist dissolution of the individual.

### 3. OBJECTIFICATION AND THE BODY

The body is invested as a fetish and is used as a fetish in a desperate attempt at identifying oneself.

-Jean Baudrillard (*Plastic Surgery for the Other*)

The self or the individual operational in a transaesthetic reality is painfully aware of the body as the site of struggle. The medical industry addresses psychological and physiological pain and presents to work on the elimination of that pain through ‘treatment’, health ‘care’ and patient-centred services but is complicit in the reproduction of the same pain. Aesthetic reconstructions magnify abjection, through depiction of the fragmentation of the body image. There is a desired ‘after’ longed for by the desiring ‘before’. Natural bodies are reminded of their abject reality, the liminality of the body subject to aging, injury and the cultural hegemony of the aesthetic imaginary. Louis Althusser in *Ideology and Ideological State Apparatuses* uses the term ‘interpellation’ and observes how the state recruits subjects that acknowledge the dominant ideology thereby becoming complicit in their own oppression; in this context, objectification.

Objectification can be viewed as an accusation in the postmodern feminist context. Martha Nussbaum (1995) lists seven features of objectification: instrumentality, denial of autonomy, inertness, fungibility, violability, ownership, denial of subjectivity. Rae Langton (2009) additionally identified three more: reduction to body, reduction to appearance and silencing.

Medicine as war or combat as evidenced in Donne’s view of illness in 1627 as a “siege” or a “canon shot” that “invades”; Sydenham: “I steadily investigate the disease... I proceed... towards its annihilation”. The approach became more dominant with Louis Pasteur’s “biomilitarism” in the 19th Century. In 1904, ‘the war against cancer’ reflected, unashamedly, an imperialist view where cancer was compared to the dark continent of Africa that needs to be conquered and its metastatic nature compared to the “anarchic Bolsheviks”. 20th century medical narratives encourage ‘aggressive’ treatments towards disease with “patients in the line of fire”.

South Korea is the world’s cosmetic surgery capital. Aesthetic surgery has become normalized in the life of an average South Korean with aesthetic ‘jobs’ such as a double eye-lid surgery, nose contour, jaw sharpening becoming common options for an average educated South Korean. Not to mention the boom of the Korean Wave or the *Hallyu* has boosted medical tourism in South Korea. Aesthetic surgery has often received responses ironic to its own boom. Those who undergo the knife to conform to social standards of beauty are often criticised for being too ‘plastic’ and not ‘natural enough’. Yet the boom of the industry and the pervasive anxiety to look but not really be what a natural body would be, legitimises the paradoxical existence of the aesthetic discourse. The West has often reported the South Korean normalization of aesthetic procedures as an ‘obsession’ and a patriarchal scarring on South Korean women, when, in reality, South Korean men opt for aesthetic procedures in large numbers too (*Gender, Globalization and Aesthetic Surgery in South Korea*). Western feminist discourse finds its limitations due to the subjective perspective created by the reality of aesthetic procedures in the West done as objectifying endeavours. Traditional South Korean beliefs in physiognomy and the contemporary South Korean national identity discourse view aesthetic interventions as mere qualifications or enhancements. Additionally, Nussbaum views objectification as *positive* if it operates in an environment of equality, respect and consent. Aesthetic surgery in the West has largely been done by women, the most common procedures being breast enlargement and liposuctions. In South Korea, the most common aesthetic procedures are not gendered procedures such as the double eyelid surgery.

So Yeon Leem observes how it aligns with South Korea's "enthusiasm for education, self-improvement and enhancement... Plastic surgery is not just about being 'normal' or 'passable,' but about moving forward and being 'above normal' for Koreans" (*Huffington Post*). While Nussbaum argues that objectification can be positive if it operates in an environment of equality, respect and consent, linking a human's beauty with success is an endeavour to gain "medical control" over them (*The Beauty Myth*). Access to medical technologies to aid aesthetic enhancement is also a matter of economic privilege thereby rendering beauty as a class issue and not merely an issue of the human body. Yet in the inhabitation of an integral reality, navigating the neoliberal guises of empowerment, it is vital to position the humanist concept of individual agency threatened by medical inflations and Dataism.

## 4. DATAISM AND MEDICAL HUMANITIES

Humanism is now facing an existential challenge and the idea of 'free will' is under threat.

-Yuval Noah Harari (*Homo Deus*)

Dataism encourages better data processing and also indexes a transhumanist utopia where data is easily accessible to everyone which would spearhead the progress for every collective. If standards of aesthetics feed into social discourses as mere algorithms rather than viewed as social constructions which they most certainly are, it might result less in creating a cultural hegemony of the normal but rather aim at refuting the humanist ideal of aesthetics (beauty lies in the eyes of the beholder that signifies an objectifier and the objectified) steeped in classism and sexism. Aesthetics as a means to transform rather than to conform, to gain agency rather than to submit, is the transhumanist utopia that can be envisioned in a dataist utopia. Bodies still remain the site of struggle, the site of meaning but do not become the devalued object. In a dataist dystopia, free will is a myth and agency, unthinkable. In a dataist utopia, a synthetic formation of the humanism and dataism, there can exist the body of the transhuman, the 'beyond human' indicative of the posthuman. Cary Wolfe mentions Foucault's observation that humanism is "its own dogma, replete with its own prejudices and assumptions" founded on Balibar's "anthropogenic universals" as an establishment of "different degrees of humanity" (*What is Posthumanism* xiv). In this manner, humanism reproduces normative subjectivity. Transhumanism, consequently, is an "intensification of humanism" (xv). Even as Wolfe sees transhumanism as an improvement of humanism that is not quite liberating, the ability of transhumanism to structurally modify the subjective experience of human existence foregrounds the idea that transhumans are "eventual posthumans", implying posthumanism as not a state of 'after-human'.

## 5. AGENCY AND THE POSTHUMAN

The medical industry stands at the very centre of the transition from the humanist to the dataist worldview. Harari exemplifies this with the case of Angelina Jolie's preventive double mastectomy, a result of her genetic test rather than the onset of the actual pathological condition. The shift of authority from the individual to the data does not wrest agency from the individual. If data processing systems and AI flourish in healthcare, it could improve, quite significantly, the quality of human life and ensure agency. Health and fitness has always been a relative notion, a kind of birth lottery, reinforcing social inequality. Dataism has the potential to bring the subject to the abject and to acknowledge the abject. Martin O'Brien in *Survival of the Sickest* observes the politics of sickness in an environment of the normative. Though the abject will forever be the source of horror, the abject is also the source of agency and distribution of equal health capital can ensure agency. Dataism needs the medical humanities to enrich human life in the wake of the posthuman era. The medical industry must ensure this by bring 'hospitality to the hospital' and counter medical indifference with empathy even as bodies remain sites of struggle and the self, a mere creation of indexicality.

Where there is power, there is resistance ... this resistance is never in a position of exteriority in relation to power.

-Michel Foucault (*A History of Sexuality*, 95)

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## Public Health Care System in India- Facts and Challenges

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### **ABSTRACT**

*India has vast health care system in public as well as private sector. The public sector system is cheap as compared to developed countries but it is not adequate to cater the need of huge population of the country. Private sector, on the other hand is good in services but it is costly and unaffordable locally. To have access for medical services, public health system is to be improved by the government. The problems of shortage of hospitals, qualified doctors, less intake capacities, poor services are to be overcome by bringing improved policies and strategies. India has been gaining importance worldwide for medical tourism and therefore the public health care system should be given importance to keep confidence among the foreigners too. It will not only help to enhance an image of the country but also will help to build good human capital base in the nation. The health nation is represented by healthy people and therefore the priority should be given to not only setting up new primary centers but also should ensure that they are operationally efficient.*

*This paper is an attempt to highlight the facts of Indian Health care system and target the public health care system in India stating challenges faced by it.*

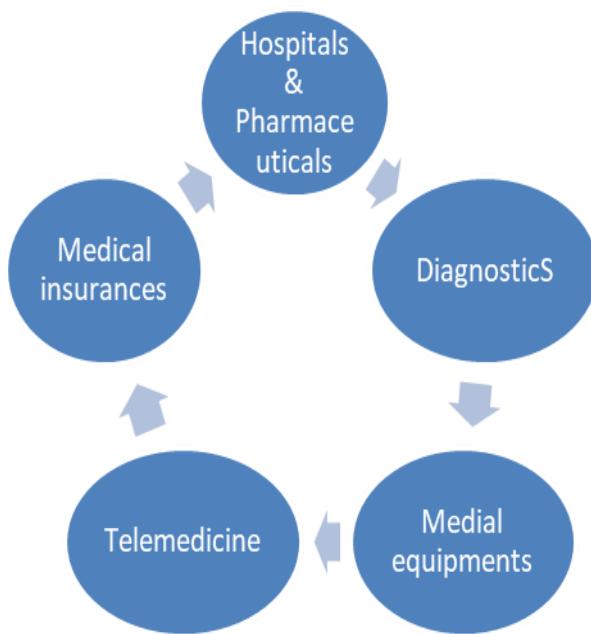
*Keywords: Public Health care system, CAGR, human capital, accessibility, affordability*

### **1. INTRODUCTION**

India is one of the highly populated countries in the world. Hence the health care system is vast in our country. It clearly shows urban-rural divide. Indian health care system is one of the cheapest among developing countries but locally it is unaffordable many a times. In Public sector it is subsidized but services are unsatisfactory whereas in private sector it provides best services but it is beyond the abilities of local people being highly expensive. Medical tourism is on rise in India so GOI is claiming much improvement in the system. In our country, the health care system is mostly administered by the states keeping in mind health services to be provided in rural areas and poorest region.

At one hand where system is claimed to be improved, there is discrepancy in the quality and coverage of medical services in India. There are enumerable problems like shortage of beds, poor buildings, unhygienic space, shortage of doctors, poor food etc. in public health care system. At the same time the best quality is served in private health care system. Then too according to IBEF, India may rank amongst the first three health care markets in coming years. The reason is low cost medical services and growing CAGR. Generally, Health care system is operated through five segments.

- Hospitals & Pharmaceuticals ( All health care centers and Manufacturing )
- Diagnostics : (Laboratories)
- Medical instruments ( Surgical and Lab instruments )
- Medical insurances ( for reimbursement)
- Telemedicine : ( access to rural and remote areas)



According to IBEF the facts of health care system are:

Number of hospitals	1,96,312
Private medical colleges (till 2015)	215
Blood bank	2760
Ayush hospital	3601
Government medical colleges	189
Post graduate students in medical	25346
MBBS medical colleges	404
Number of Sub-centers	256926
Doctor to patient ration	1:1674
Market size	USD 110 billion

Sources: [www.ibf.com](http://www.ibf.com)

## 2. NEED AND SIGNIFICANCE OF THE STUDY

Being populated nation, medical services to each citizen is a human right. But yet health care system in India is not well developed. There are incidences where women had to give birth to children on road or hospital premises, dead body had to be carried on shoulders due to chargeable ambulances (Orissa), the girl had to hold saline stand for hours to save father in west Bengal, rice was served on the floor to the patients in U.P and so on. It is really a serious matter to be thought upon questioning whom we are serving. Why can the better access of health be provided to everyone. The condition of public health care system is questionable in India today. Hospitals are provided with the best medical machineries but the intake capacity is too less that people have to wait for the admission or die. There is no other option when private system is too costly. So there is a need to understand the challenges of the Public health care system in India today.

## 3. OBJECTIVES OF THE STUDY

1. To highlight the nature of Public Health Care system in India.
2. To discuss the problems of Public Health Care system in India.
3. To state challenges and incidences related to PCS system.
4. To suggest some measures to curb the problems of PCS system.

## 4. METHODOLOGY OF THE STUDY

All the data used in the study is purely secondary in nature. It has been referred from primary surveys and reports of government as well as private agencies and institutions. Apart from it, related information has been taken from various articles, research papers, journal write-ups and online sources.

## 5. LITERATURE REVIEW

- **Goel (1984)** tried to indicate role of public health administration in socio-economic development from the angle of equal distribution of the resources. The book tries to find out the role and significances of the PHA comprehensively.
- **Madavalla Swati (2010)** studies the public health centers in rural Maharashtra and tried to show condition of these centers with references to services provided with its structure, the cost and delivery/. The main objective of the study was to highlight the features of PHC's in Maharashtra and impact on its stakeholders.
- **Jimmy (2011)** investigated and ascertained overall health care mechanism in the targeted primary Health Centers (PHC) including OT, IP facilities. She tried to ascertain basic infrastructural facilities of PHCs in the selected areas and found deficiencies therein. She studies overall impact of PHCs in the district. She gave suggestions for the betterment of these PHCS.
- **Hemraj (2012)** studied the existing status of NRHM activities in the selected areas in the state. He focused studies on hilly regions of Himachal Pradesh. He studies fund flow mechanism and its utilization at all levels and suggested measures for effective implementation of NRHM.
- **Rohit (2012)** put forth the study of existing Health Management Information System in Rajasthan mainly in Public Health System. He attempted to develop framework for evaluation of HMI and also showed its strength and weaknesses. He also suggested some measures to enhance the HMI system in Rajasthan.

## 6. ANALYSIS OF THE STUDY

### Challenges

- India spends half on health care system compared with BRICS nations. There are high maternity deaths, low life expectancy too.
- There is shortage of beds and also trained service providers including doctors. Per doctor numbers of patients are in thousands. So difficult to provide on time and best services.
- Accessibility is a big problem in case of cancer, surgery patients as they cannot wait for long to get treatment.
- Managing large hospital with human and physical infrastructure is difficult.
- Matching standards with private health care system to provide quality medical services.
- Controlling growth of non-communicable diseases creating threat to the mankind.
- Enhancing medical education and research for the betterment of people and control on emerging diseases.
- Better implementation of RBSY and NRHM to achieve desired goals.
- Regulations to be strengthened and along with free insurances to the needy ones.
- Increasing percent in GDP to be spent on medical expenditures, especially high drug expenditures.
- Legislative reforms should also be introduced to develop public health care system.

### Recent Real cases (limited)

- Nearly hundreds of children have died in last a few months again in kota and Bihar.
- In 2016, A Tribal man from Odisha had to carry death body of his wife on shoulders for almost 10 km as he had no money and authorities denied him to give ambulance
- A Women form Shravasti district from U.P had to give birth to the child on road as she was turned away from two hospitals due to lack of money.
- In metro cities, there is always a problem of medical services in public hospitals. There are enumerable cases like this.

## 7. MEASURES

- There has to be a serious monitoring of primary and sub centers opened for providing good health care.
- The investments should be made on infrastructure as well when new hospitals are being opened.

- Doctors and service providers should be given consideration financially and academically through research and development programmes.
- Like private hospitals, Hygiene environment should be encouraged in the hospital.
- Subsidized health care should be enhanced through more policies and programmes announced.
- Medical education and ethical service should also be encouraged with professionalism courses provided to the new generation medical service providers
- Special consideration should be given to health care information system, management, operational efficiency and leadership.
- Ensuring accessibility, affordability and accessibility in the health care system.
- There should well integrate health care system controlled by each state with moral obligation.
- Special consideration should be given to the children, old people and BPL population.

## 8. CONCLUSION

It is necessary that government should increase public spending on PHS as the majority population of the country belongs to lower income group. And it is difficult for them to get accessibility to timely and proper medical services. Human capital can never be made efficient unless provision for developing PHS is sought. The healthy people represent health nation. Health care of each citizen should be taken care of by the government enabling them to have affordable medical services.

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## A Study on Perception towards Social Media on Medical Tourism and Health Care Services

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### ABSTRACT

*Medical tourism is one of the blooming industry that creates positive image in the mind of patients by increase the hope and confidence. So a study was done to understand the perception towards social media on medical tourism and health care services in Chennai city. Study was done empirically with a sample size of 112 respondents. Study found that the tourists prefer domestic trips rather than an international trip. The results positively impacts the various usage of social media with respect to medical tourism services and the major social networking sites used were Face book, Whatsapp, Instagram, Google+, twitter, YouTube, blogs Trip advisor, holiday iq etc. Top preference while ranking is for sightseeing tour, pilgrimage tour, and health care tour. Least preference is for business, festival and fun based tours. Results reveal that Medical tour didn't attract tourists.*

**Keywords:** Medical tourism, social media, health care

### INTRODUCTION

Medical tourism is considered as one of the fastest growing sector and it had created attention there by generating more income from international tourists by providing health care related information services. Effect of increase in the health care costs and with the emergence of more quality medical service providers has played a vital role in increasing the economy of developing countries like India. The industry provides dental, surgical and other general health care services across the globe. With social media influence the industry creates awareness about the various medical services available throughout the world and it generates business growth nowadays. Social media acts as connecting agents between the patients and service providers.

Patients were collecting information regarding medical tourism services from social media and mainly through social networking sites. Face book, LinkedIn, Twitter, Google+, Trip advisor, holidayiq.com and You Tube would be social networking sites they were regularly using for viewing reviews, blogs, websites, and videos and also participating in forums by posting their comments. The medical tourists were reviewing the service providers through social media before fixing medical tours. It has also created value among the tourists as well as triggers them to undertake a medical tour to popular destinations.

### REVIEW OF LITERATURE

**Mallesha and Anitha(2019)** had addressed about a study on social media marketing strategies in tourism industry. This empirical study reports about the impact of social media in tourism and how it triggers them while making decisions, strategies followed by the service providers to attract tourists. Data was collected from domestic and international tourists. The study found that face book is the app used by majority of the tourists. The tourists aware about the various health care service providers through social networking sites only. The study concluded that the service providers should adapt suitable social media marketing strategies to survive in the competitive market.

**Fernanda and Conceicao (2019)** have studied about the medical tourism in Portugal. They have discussed about the role of medical tourism among the patients and their source of information, health care services available for them. Study perceived the importance of information networking sites and its impact among the medical tourists, transforming Portugal as a medical tourism hub as it might generate revenues. Already the destination has good infrastructure, resources, but only few aware about the medical services provided. The study suggests the service providers to create awareness and create a good image in the minds of tourists.

**Eda Turanci (2019)** has made a study of how the social networks help in promoting medical tourism with special reference to instagram. The hash tag health tourism turkey was taken for the study. Based on the no of shares analysis was made. It was acting as a highlighter and indicator among the public which was used as a promotional tool by the clinics, health care service providing agencies, dentists etc. The study recommended using the social media effectively to promote medical tourism.

## OBJECTIVES

- To study about the impact of Social media on medical tourism and health care services
- To provide suggestions to improve medical tourism and health care services using social media.

## SCOPE OF THE STUDY

The study was focused to understand the role and impact of social media on medical tourism and health care services and to identify the major networking sites used by the community, in Chennai city only.

## RESEARCH METHODOLOGY

The study is a descriptive research . The researcher has used convenience sampling method to collect data with a sample size of 112 respondents. Data collection was made using Google forms.

## ANALYSIS AND INTERPRETATION

The study has done the percentage analysis and correlation analysis. The researcher has made an attempt to find out the ranking preference of the respondents towards various types of tours.

### Ranking preferences of the respondents towards various types of tours

S. No.	PREFERENCES FOR TOURS	NO. OF RESPONDENTS	RANK	
			1	FIRST
1.	Sightseeing tour	33	1	FIRST
2.	Pilgrimage tour	18	3	THIRD
3.	Adventurous tour	6	7	
4.	Entertainment tour	8	6	
5.	Medical Tour	12	4	
6.	Business tour	5	8	EIGHT
7.	Festivals tour	1	10	TENTH
8.	Fun tour	4	9	NINTH
9.	Health care tour	15	2	SECOND
10.	Educational Tour	10	5	

### Interpretation

It has resulted that the respondent's top preference while ranking is for sightseeing tour, pilgrimage tour, health care tour. Least preference is for business, festival and fun based tours. Results reveal that Medical tour didn't attract them.

### Correlation

The study made an attempt to find out the significant relationship between age & frequency of travel with respect to perception on social media aspects for medical tourism and health care services.

**H<sub>0</sub>:** There are no significant relationship between the Age and Frequency of Travel of the respondents with respect to the Perception on Social Media aspects for medical tourism and health care Services.

## AGE & FREQUENCY OF TRAVEL - PERCEPTION ON SOCIAL MEDIA

## ASPECTS FOR MEDICAL TOURISM AND HEALTH CARE SERVICES

VARIABLES	N	'r' VALUE	P – VALUE	RELATIONSHIP	REMARKS	
					SIGNIFICANT	RESULT
Age – Perception on Social Media aspects for medical Tourism and health care Services	112	0.263**	0.000	Positive	Significant	Ho is Rejected
Frequency of Travel – Perception on Social Media aspects for medical Tourism and health care Services	112	0.375**	0.000	Positive	Significant	Ho is Rejected

## INTERPRETATION

As the P values are lesser than Sig. Value (0.01) in the above cases, the Null Hypotheses are rejected. There found a positive correlation between Age and Frequency of Travel of the respondents with respect to the Perception on Social Media aspects for medical Tourism and health care Services. The relationship between them is highly significant.

However, Frequency of Travel ( $r = 0.375$ ) has relationship with the Perception on Social Media aspects for medical Tourism and health care Services than the Age of the respondents. Hence, there are significant relationship between Age and Frequency of Travel of the respondents with respect to the Perception on Social Media aspects for medical Tourism and health care Services.

## FINDINGS OF THE STUDY

- The Study highlights that Majority of the respondents (56%) were male, (63%) were married, (52%) were falling under the age category 30 to 50 years, (58%) were falling under the category degree (UG/PG) holders, (47%) were salaried persons and (55%) were having an income of more than Rs. 50,000.
- The Study has revealed that majority of the respondents (49%) belong to nuclear family, (62%) aware about medical tourism and health care services provided domestically and internationally. Most of the respondents (56%) were using social media for 1-3 years and (48%) spend time for less than two hours in social media. 22% of the respondents have replied the length of the trip will be for 5 to 7 days. 67% of the respondents prefer domestic trips rather than an international trip.
- The results of the study positively impacts the various usage of social media with respect to medical tourism services and the major social networking sites used by the respondents (64%) to collect information were Face book, Whatsapp, Instagram, Google+, twitter, YouTube, blogs Trip advisor, holiday iq etc.
- The study shows that the tourists usually check the reviews about the medical tourism service providers before booking a service regularly and share their comments also. The respondents accepted that the photos and pop up messages shared by the service provider has influenced them to book a service.
- The study found that tourists expect offers and discounts for a service and they feel the tour packages were quite expensive.
- Respondent's top preference while ranking is for sightseeing tour, pilgrimage tour, and health care tour. Least preference is for business, festival and fun based tours. Results reveal that Medical tour didn't attract them.
- There are no significant relationship between the Age and Frequency of Travel of the respondents with respect to the Perception on Social Media aspects for medical tourism and health care Services.

## SUGGESTIONS

- Appointment of a social media expert to create awareness by providing a good content about medical tourism in order to attract its potential customers towards medical tourism services.
- The tourists are expecting positive reviews. If suppose a tourists provides negative word of mouth, complaints means it should to immediately addressed.
- The respondents lack trust towards the information available through social media and they were thinking as the information is not accurate and reliable. Authentic information must be provided by the medical tourism service providers

## CONCLUSION

Medical tourism and its impact after using social media is found to be in infant stage. Even though some measures were taken by the service providers to promote medical tourism through social media through advertisements, it wasn't noticed by the tourists. The service providers have to identify the factors which affect their online services. The outcome of the study may help the hotel industry to adapt suitable marketing strategies to extend their better services to the community. The study highlights about content analysis.

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## Accessibility of Primary Health Care Services

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### ABSTRACT

*Primary Health Care centres are established with the intention to provide accessible, affordable and available primary health care to the common people at their door step, with specific focus on the rural and vulnerable sections. The success of PHC lies in the maximum utilisation of its services by the people. But many reports and studies have pointed out that utilisation of PHC services is low both in rural and urban areas, as it is influenced by numerous factors. Unless these factors are identified and the measures taken, the goal of "Universal Health Care and Health for All" may not be achieved.*

*In this background the present paper attempts to study the extent of utilisation of PHC services in rural areas and tries to track the factors influencing the accessibility of PHC services. For this purpose, a Case Study of Wada PHC in Thane district has been undertaken. It was found that only 82% of people have access to PHC. The reason for not accessing PHC services in the study area are recognized as income level, distance and education level. The distance to the PHC is found as major determinant to the access of health care services from PHC, as it is found to be significant at 10% level.*

**Keywords:** Accessibility, Distance, Health Care Services, Wada, Primary Health Centre.

### INTRODUCTION

Primary Health Care defined as an essential health care which should be based on practical, scientifically sound and socially acceptable method and technology. It should be universally accessible by the individuals and the family in the community through full participation. It is to be made available at a cost which the community and the country can afford to maintain at every stage of its development in a spirit of self-reliance and self-determination.

The World Bank Organisation Alma-Ata Declaration defined Primary Health Care as incorporating curative treatment given by the first contact provider along with promotional, preventive and rehabilitative services provided by multi-disciplinary teams of health-care professionals working collaboratively.

PHC is the first level of contact of the individuals, the family and the community with the National Health System, bringing health care as close as possible to where the common people live and work. Access to Medical services has historically been used as a measure of a fair distribution. The concept of equality of access to health care is a central objective of many health systems. It implies that individuals should be given equal opportunity to use health services without regard to other characteristics such as their income, ability to pay, ethnicity, or area of residence.

### REVIEW OF LITERATURE

**Pölluste, Kallikorm** (2011) in their cross-sectional study titled "Satisfaction with Access to Health Services: The Perspective of Estonian Patients with Rheumatoid Arthritis" explained the possible determinants of satisfaction with access to health services in patients with rheumatoid arthritis (RA). The results demonstrated that Estonian RA patients are satisfied with their access to health services. Factors that had a negative impact on satisfaction included pain intensity, longer waiting times to see the doctors, as well as low satisfaction with the doctors. Transportation costs to visit a rheumatologist and higher rehabilitation expenses also affected the degree of satisfaction. Patients who could choose the date and time at which they could visit the rheumatologist or who could visit their "own" doctor were more likely to be satisfied than patients whose appointment times were appointed by a healthcare provider. In addition, the satisfaction with one's Family Doctor and rheumatologist played a significant role in people's satisfaction with their access to health services.

The study by **Nteta, et.al.,(2010)** investigated the accessibility and utilization of the primary health care services in three community health care centres in the Tshwane of the Gauteng province, South Africa. It showed that in terms of distance, the clinics were accessible as most of the participants lived within 5km of such a facility, and the Tuberculosis (TB) clinic was the most frequently visited service. Further it stated that

long queue, lack of equipment, staff shortage, slow service delivery and negative attitude of health care staff were major constraints in utilization of Community Health Centres.

**Krajewski, Hameed, et.al., (2009)** in their paper “Access to emergency operative care: A comparative study between the Canadian and American health care systems” tried to determine the differences in access to emergency operative care between Canada and the United States. The results suggested that access to emergency operative care is related to Socio Economic Status (income) in the United States, but not in Canada. This difference

could result from the concern over the ability to pay medical bills or the lack of a stable relationship with a primary care provider that can occur outside a universal health care system.

**Nair, Thankappan, Vasan (2004)** in their paper “Community Utilisation of Sub centres in Primary Health Care--An Analysis of Determinants in Kerala” tried to identify the determinants of utilisation of sub centre services. It found that about 30 per cent of the beneficiaries utilized services of the sub centres during the reference period. And the district in which a sub centre was physically present had highly correlated with its utilisation.

The above literature review confirmed that the utilisation of health care services is influenced by a number of factors such as income level, distance, location of centre, high cost, medical staff, infrastructure, insurance coverage and so on. In this regard the present paper attempts to study utilisation pattern of PHC services and the factors influencing the accessibility of PHC services in rural area.

## OBJECTIVES OF THE STUDY

1. To investigate the accessibility Pattern of Primary Health Care services in Study area.
2. To study the utilisation Pattern of Primary Health Care services in Study area.
3. To identify the factors influencing the accessibility of Primary Health Care centres in rural area.

## SAMPLING

By using simple random sampling method 50 individuals were interviewed respectively. Also informal discussion was made with the Medical officer and Auxiliary Nurse Midwives and other staff of the PHC to know the current status of PHC and its history.

## DATA COLLECTION

The present study is purely based on primary data. The data is collected from well-structured questionnaire, where questions were asked about Age, Average income, Education, Awareness about PHC and Government services, Distance to PHC and other issues. In order to make the study more representative, an attempt was made to interview the individuals randomly.

## TOOLS FOR ANALYSIS

Along with Custom tables, Bar and Pie chart have been used to analyse the collected data.

## BACKGROUND OF STUDY AREA

Wada is a village in Raisal, in Thane district, about 90 km from Mumbai city in Maharashtra, India. The present study is related to Wada PHC, which is physically found in Wada village.

## LIMITATION OF THE PRESENT STUDY

The data was collected in the month of September 2019; the response of the individuals may vary according to the time and place. Responses from the individuals have a time bound of one year. Sample size is only 50 which may not be sufficient to universe to assess the accurate and actual results.

## RESULTS AND FINDINGS

**Table 1: Demographic Profile of Respondents**

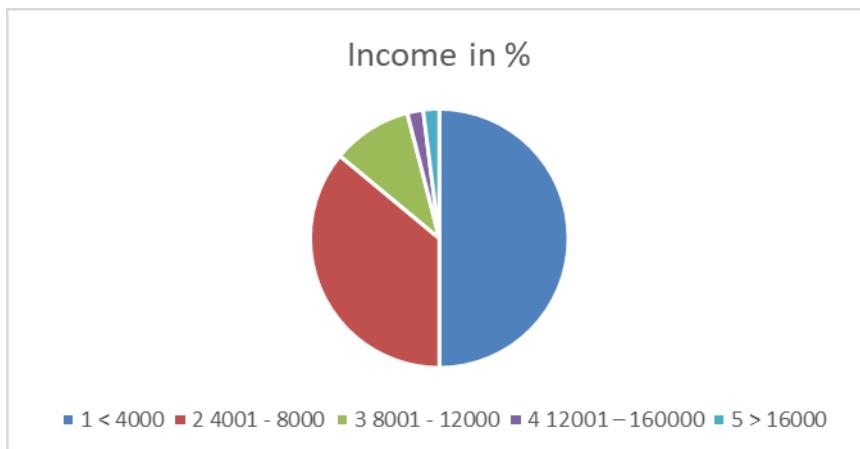
Sl. No	Profile variables	Male	Female	Total
		. Age		
1	18-37	6 (26.1)	18 (66.7)	24 (48.0)
2	38-57	8 (34.8)	8 (29.6)	16 (32.0)
3	58-77	9 (39.1)	1 (3.7)	10 (20.0)
Total		23 (100)	27 (100)	50 (100)

B. Education				
1	Illiterate	7 (30.4)	11 (40.7)	18 (36.0)
2	< 7th std	3 (13.0)	3 (11.1)	6 (12.0)
3	7th -10th std	7 (30.4)	10 (37.0)	17 (34.0)
4	PU (12th std)	3 (13.0)	2 (7.4)	5 (10.0)
5	Above PU	3 (13.0)	1 (3.7)	4 (8.0)
Total		23 (100)	27 (100)	50 (100)

The table 1 reveals that, out of 50 respondents 23 i.e., 46% are Female and 27 i.e., 54% are Male. Greater variation is observed in the composition of age of respondents with, 24(48%) belong to 18-37 age group, highest among the three group. 16 (32%) belong to 38-57 age group and a few i.e., 10 between 58 to 77 age group. Regarding the educational level, the table reveals that 36 % i.e., 18 of respondents are Illiterate and 64% (32) are literate. It found that majority of the literate respondents i.e., 17 have completed their schooling between 7th to 10th class (higher secondary schooling) and a very few had completed college education and above.

**Table-2: Income-Wise Distribution of Respondents**

Sr.No.	Income in Rs.	Income in %
1	< 4000	50%
2	4001 - 8000	36%
3	8001 - 12000	10%
4	12001 – 160000	2%
5	> 16000	2%



The Figure 1 shows that 25 (50%) out of 50 respondents belong to below 4000 income group category. 36% and 10% of the respondents were under 4001-8000 and 8001-12000 income group category respectively. The 12001-16000 and above 16000 income category had only 1 respondent in each of them.

**Table-3: Awareness on Primary Health Centre**

		Aware of PHC		Total
		Not Aware	Aware	
Gender	Male	7 (31.8%)	16 (57.1%)	23 (46.0%)
	Female	15 (68.2%)	12 (42.9%)	27 (54.0%)
Total		22 (44.0%)	28 (56.0%)	50 (100%)

Table 3 shows that out of 23 male respondents 7 i.e., 31.8% and 15 i.e., 68.2% out of 27 female respondents were not aware of the word PHC, with 16 of males and 12 of the females being aware of the word PHC. The aggregate figure reveals that 28 respondents out of 50 i.e., 56% were aware about PHC word. And also found that 44% i.e., 22 of the respondents not even heard the word Primary Health Centre and they use to identify them as Government Hospital.

**Table-4: Awareness on Government Health Programmes**

		Aware of Government Programmes		Total
		Not Aware	Aware	
Gender	Male	7 (46.7%)	16 (45.7%)	23 (46.0%)
	Female	8 (53.3%)	19 (54.3%)	27 (54.0%)
Total		15 (30.0%)	35 (70.0%)	50 100.0%

In the Table 4, a different pattern was observed relating to the awareness about the government health programmes when compared to PHC awareness between gender. It was found that out of 35 respondents 19 (54.3%) belong to female who have an information on Government health programmes initiated by Government of India under National Rural Health Mission 2005 programme. This was observed because majority of the women in the during their maternity time.

**Table-5: Access to Primary Health Centre**

		PHC		Total
		not visited	visited	
Gender	Male	5 (55.6%)	18 (44.0%)	23 (46.0%)
	Female	4 (44.4%)	23 (56.0%)	27 (54.0%)
Total		9 (18.0%)	41 (82.0%)	50 (100%)

The above table 5 indicates that major users of PHC are females, which comprises 23 respondents (56%) out of 41 users. It was found that most of them visited PHC for Maternity or Pregnancy check-ups (Preventive Care)

**Table-6: Access to PHC with Income levels**

Income in Rs.	Visited	Not Visited
< 4000	20	5
4001 – 8000	16	2
8001 - 12000	1	4
12001 – 160000	1	0
> 16000	1	0

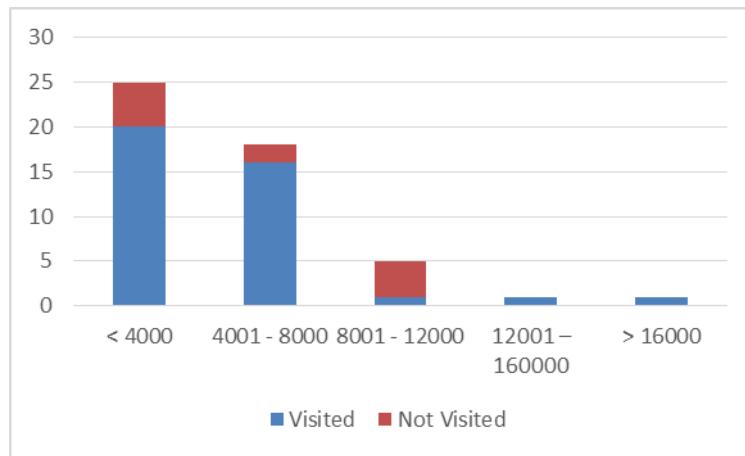


Figure 2: Access to PHC with Income levels

Figure 3 shows that out of 25 interviewed from <4000 income group 20 (80%) are reported as a user's of PHC services, followed by 88% in 4001-8000 and 80% in 8001-12000 income group. It was found that major users of PHC were the people whose income is between 4001-8000. The result supported the findings of the previous studies that utilisation of PHC services is high in lower income groups than the higher income groups.

**Table-7: Access to PHC with reference to Education**

	Illiterate	Literate
Visited	15	26
Not Visited	3	6
Total	18	32

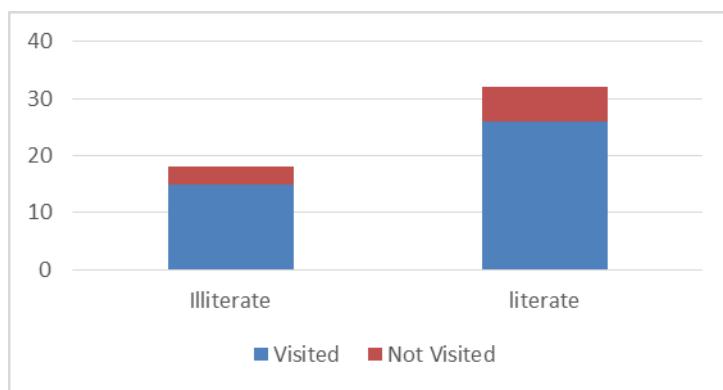


Figure 3: Access to PHC with reference to Education

The above figure 3 reveals that out of 18 illiterates 15(83%) are utilising PHC services, on the other hand literates accounts only 81% (26 out of 32). Due to less difference in the utilisation percentage no such significant difference is identified between illiterates and literates.

## CONCLUSION

Utilisation of health care services has become one of the great concerns in the area of equitable distribution of health services. In this regard the present paper made an attempt to study the utilisation pattern of Primary Health Centre services in rural area in form of Gender, Education, Income and Distance. It was found that in the study area 82% people are utilising PHC services. The results support earlier findings on relationship between Utilisation of PHC service and Education level, Income and Distance. It was found that utilisation of PHC is negatively associated with education level, income and distance. The distance was found to be the only statistically significant determinant. The study findings also supported by the reasons sated by the non-users of the PHC services that even though the Wada PHC is situated just beside the highway respondents find longer distance, poor road and transport facilities as major constraints in their accessibility.

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## A Study on the Role of Social Media as a Preferred Source of Health Information During Illness

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### ABSTRACT

Nowadays social media platforms provide information about health care, policies, healthcare practices among the public and it is a gateway for interactions about health care. It provides information and also disseminates accurate information at the right time. So an attempt was made to know the impact of social media in health care in Chennai. Descriptive research was chosen for the study. The researcher has used convenience sampling method and Data collection was made using Google forms. Totally 172 respondents responded for the study. The statistical tools used for the study were correlation and factor analysis. From the study it was found that majority of the respondents prefer social media for collecting information regarding health care and health care advertisements through social media. It had influenced them, majority of the respondents agreed that they will participate in health care related forums and discuss about health care issues.

**Keywords:** social media, health care

### INTRODUCTION

Social media is completely providing a huge space for the community at large to discuss about their health care than visiting to hospital or clinic. Technological advances in healthcare are enormous and it is well received and appreciated by general population. According to a Journal of Medical Internet Research health Literacy study, nearly 90 percent of older adults have used social media to seek and share health information. Healthcare is gradually changing among the commoners and they educate themselves in health care rather than the object of it. Although the activity on social media is drastically increasing and reaching to its full potential in health sector as well in other sectors.

Patients & families discuss medical condition in social media e.g.: - Facebook, Twitter as Individual physicians can reach their patients through practo to update them with medications and also to answer disease related questions or simply to provide advice or reminder and many more to share their experiences and as well educate others when similar condition occur. The various social media sites used for searching the health care related information was Facebook, YouTube, Twitter, LinkedIn, Practo, Whatsapp, Instagram,etc.

### REVIEW OF LITERATURE

**Manikant Tripathi et al (2018)** has analysed about the effects of social media on human health. The study found that social media has expanded the knowledge of the physicians and clinical assistants. They share information through social media to the patients. Medical faculties were teaching through social media, providing therapies, creating awareness during epidemic issues. Social networking has negative impacts such as poor health care, worst life Style, minimised face to face interaction. It also gives some misleading information, viral messages, rumours about the health care.

**Shashi pratap singh et al (2016)** had studied about the effects of social media in health care. People participating in social media were health professionals, physicians, centres for controlling diseases, international organisations such as WHO etc. social media was used for networking by the health professionals, clinical awareness and education, caring patients, about health insurance policies, pharmaceutical uses etc. Dangers of social media such as the inadequate information, privacy and security risks involved in social media, how it spoils the goodwill of a health service provider, legal issues. The research has echoed about the ethical practices, guidelines for health care services.

**Alma Pentesen(2015)** has made a study to find the use of social media in health care services. The study clearly depicts the usage of electronic gadgets among the Romanians. The study listed some activities such as listening to music, mobile banking, online purchase, using online maps, social networking etc. People use social media to get some information related to specific diseases, health care tips, and social media gave moral and emotional support. Health care professionals and, physicians, were enhancing their knowledge through

online forums, to search information about complicated diseases, treatments, reading reviews to compare the cost of the treatments .few accepted the information in the websites helped them in monitoring their health.

## OBJECTIVES

- To study about the Role of Social Media as a Preferred Source of Health Information during Illness
- To provide suggestions to improve the usage of social media in health care.

## SCOPE OF THE STUDY

The study was focused to understand the role of social media as a preferred source of health information during their illness among the respondents in Chennai city only.

## RESEARCH METHODOLOGY

The researcher has chosen descriptive study. The researcher has used convenience sampling method to collect data with a sample size of 172 respondents. Data collection was made using Google forms.

## ANALYSIS AND INTERPRETATION

Percentage analysis was made to understand the respondent's opinion towards the role of social media as a preferred source of health information during illness.

Correlation analysis was done to find out the relationship between demographic factors and preferences sources of health related information during illness

H0: There is no significant difference between the demographic factors of the respondents and their preferred sources of health information during their illness.

### Correlation analysis

Demographic factors		Gender	Marital status	Age	Qualification	Income
Gender	Correlation	1.000	.014	-.093	.212	-.289
	Significance (2-tailed)	.	.854	.225	.005	.000
	df	0	169	169	169	169
Marital status	Correlation	.014	1.000	-.602	-.163	-.339
	Significance (2-tailed)	.854	.	.000	.033	.000
	df	169	0	169	169	169
Age	Correlation	-.093	-.602	1.000	.028	.449
	Significance (2-tailed)	.225	.000	.	.718	.000
	df	169	169	0	169	169
Qualification	Correlation	.212	-.163	.028	1.000	.105
	Significance (2-tailed)	.005	.033	.718	.	.172
	df	169	169	169	0	169
Income	Correlation	-.289	-.339	.449	.105	1.000
	Significance (2-tailed)	.000	.000	.000	.172	.
	df	169	169	169	169	0

### From the correlation analysis it was found that

1. There exist a positive correlation between the search preference Vs marital status, qualification
2. There exist a negative correlation between the search preference Vs gender, age, income.

## FACTOR ANALYSIS

Total variance explained

Statements	Initial Eigen Values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Before going for a treatment I will read reviews and check ratings regarding health care through social	4.622	38.519	38.519	4.622	38.519	38.519

media						
I face information privacy issues while searching health care related information	1.202	10.013	48.532	1.202	10.013	48.532
Health care advertisements through social media are influencing	1.073	8.945	57.477	1.073	8.945	57.477
I will participate in online communities while discussing about a serious health issue in the society	1.034	8.618	66.095	1.034	8.618	66.095
I believe that social media disseminates relevant and accurate information regarding health care than the traditional media	.819	6.827	72.922			
Social media provides information which is reliable and it doesn't mislead general public	.780	6.498	79.421			
Social media creates awareness about emerging health issues and its implications	.667	5.555	84.975			
Social media is a platform to learn about clinical education and healthcare through discussion forums	.574	4.784	89.760			
I will subscribe health care related e-newsletters, online videos , etc	.506	4.214	93.973			
Social media gives too much of information (by providing pictures, posts, videos etc ) and it threatens general public	.419	3.490	97.464			
I happily participate in health care awareness programmes conducted by hospitals,NGOs and others	.304	2.536	100.000			
I will recommend authentic social networking sites regarding health care to my near and dear ones	1.11E-016	9.25E-016	100.000			

Extraction Method: Principal Component Analysis.

### Component Matrix(a)

	Component			
	1	2	3	4
a	.537	.229	-.598	-.202
b	.531	.549	-.366	-.189
c	.449	.263	.491	-.369
d	.628	-.196	.048	-.432
e	.652	.129	-.139	-.031
f	.809	-.358	-.163	.331
g	.809	-.358	-.163	.331
h	.642	.255	.291	.118
i	.707	.011	.364	.012
j	.193	.581	.142	.623
k	.587	-.235	.136	-.002
l	.654	-.091	.103	-.111

Extraction Method: Principal Component Analysis.

From the variables 4 components extracted.

1. There are four factors affecting much with the preference at 66%.

2. Thus factors affect more comparative with the internal components.

## FINDINGS OF THE STUDY

- Majority of the respondents (68%) are female.
- Majority of the respondents are falling under the age category between 20 to 30 years.
- Majority of the respondents (61%) are married.
- Majority of the respondents (74%) are post graduates.
- Majority of the respondents (30%) are earning more than 50000 rs.
- Majority of the respondents (45%) prefer to go to physicians and health practitioners during illness, 30% of the respondents discuss with their friends and relatives about their illness, less than 10% of the respondents prefer internet websites, traditional media, social media networking sites during their illness, very few were using PRACTO and self analysis during their illness.
- Majority of the respondents (92%) has not done a basic short term online course in health care.
- There is no significant difference between the demographic factors of the respondents and their preferred sources of health information during their illness.

## SUGGESTIONS

- Social media content creators should provide authentic quality information to minimize health care related frauds thereby correcting the misleading health related information.
- Create clear social networking health care policies to avoid cyber crimes.
- Create awareness among the society regarding the usage of social media which provides innovative health solutions and to utilize media for an ethical purpose.

## CONCLUSION

The social media helps the health care professionals while sharing the health related information and many risks were involved in it which may affect the society. So proper care should be taken and everyone should follow an ethical health related policy and practices while share information through social media. Ethical practices will lead to improve patient engagement, build bold between patients and health care providers, improve patient knowledge towards health care, provide healthy digital place for the society.

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## Medical Tourism in India

Prof. Atul Sathe

### ABSTRACT

*In the current set-up tourism business is gaining massive financial profits. This is not limited to hotels, restaurants and historical sight scenes, but also extended to health care services globally, presented in term as medical tourism. Medical tourism or healthcare services industry is a rapidly growing industry worldwide. It is a combination of two economic activities, which represents the blend of two industries i.e. tourism and medicine. In the recent times, the globalization of the medical tourism and the immense requirement of quality health services at affordable cost, attract the foreign tourist towards developing countries like India, which adequate resources, expertise doctors, staff and hospitals to meet these demands. Now a day's foreign tourists are preferring India not only for vacations but also for health care services like surgery, knee transplantation, beauty surgery, hip replacement, dental problems and many more. Most of tourist prefers India for Ayurveda treatment and treatment from natural resources. This paper emphasis on the strengths of India's medical tourism, the challenges they have to face and the main drivers of medical tourism. It also discusses about the prospective and expansion of medical tourism in India with the help of data analysis.*

### INTRODUCTION

Medical tourism can be broadly defined as provision of 'cost effective' private medical care in collaboration with the tourism industry for patients needing surgical and other forms of specialized treatment. This process is being facilitated by the corporate sector involved in medical care as well as the tourism industry - both private and public

Medical tourists are generally residents of the industrialized nations of the world and primarily come from

- The United States
- Canada,
- Great Britain,
- Western Europe,
- Australia,
- Middle East.

But more and more, people from many other countries of the world are seeking out places where they can combine vacationing and obtaining their medical care at an affordable cost.

The medical tourism in India has been increasing every year for the spectrum of treatments that are being offered in most major hospitals which are: -

- Cardiac Surgery
- Orthopedics
- Gynecology
- Cosmetic and Plastic Surgery
- Obesity surgery
- Ophthalmology
- Dentistry
- Urology

## SUMMARY OF LITERATURE REVIEW

Research has been done in various countries for the emerging challenges and future prospects of medical tourism. As per the analysis of secondary research we can say that people travel to India for medical treatment because of the Cost factor. But Variables like quality of medical care, medical services, and country infrastructure and other factors etc. has not been studied much to increase medical tourism in India.

## OBJECTIVE OF THE PROPOSED RESEARCH PROJECT

The objective of the proposed Research project is to study the effect of perceived medical quality, service quality and country facilities in increasing the medical tourism in India.

We can do research of the above constructs by focusing on variables like

### VARIABLES

- Immigration facility
- Post treatment
- Patient Safety
- Doctor Qualification
- Hygiene
- Premedical Facility
- Country Infra
- Medical support staff
- Availability of doctor
- Climate
- Travel
- Hospital marketing
- Peer Experience

In line with our objectives, following is the hypothesis we will test to fill the gaps we find in the literature review:

### HYPOTHESIS

H1: Medical quality affects medical tourist to choose India for medical care.

H2: Medical service quality affects medical tourist to choose India for medical care. H3: Country facilities affects medical tourist to choose India for medical care.

### RESEARCH METHODS

To understand the factors affecting the medical tourism industry, we conducted the survey based research to understand the people responses to the factors other than cost which they consider for travelling to other country for medical tourism.

We have taken the following 3 constructs to conduct the questionnaire:

- Medical Quality**
- Medical Service quality**
- Country factors.**

And also identified decision variables to test the above 3 constructs on the basis of below var.

Constructs and Questionnaire

- Medical Quality**
- Patient Safety
- Doctor Qualification

- Hygiene

## Medical Services

- Post Treatment services.
- Pre Medical Facility
- Medical support staff
- Availability of doctor.

## Country Factors

- Immigration facility
- Country Infrastructure
- Country climate
- Tourism Option

Hypothesis based on the decision variables were formulated and analyzed with the help of sample T- test method.

### Sample Design

Sample Size: 90 people without any demographic preferences.

### Testing Hypothesis

H1: Medical quality affects medical tourist to choose India for medical care.

For testing the above Hypothesis, we have run the single t – test for 3 variables after gathering 90 responses from the survey.

- Patient Safety
- Doctor Qualification
- Hygiene

Results-

### T-Test

[DataSet1]

#### One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Patient Safety	90	3.03	1.075	.113
Doctor Qualification	90	2.88	1.037	.109
Hygiene	90	2.84	1.244	.131

#### One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Patient Safety	.294	89	.769	.033	-.19	.26
Doctor Qualification	-1.118	89	.266	-.122	-.34	.09
Hygiene	-1.186	89	.239	-.156	-.42	.11

H2: Medical service quality affects tourist to choose India for medical care.

For testing the above Hypothesis, we have run the single t – test for 4 variables after gathering 90 responses from the survey.

- Post Treatment services.

# Our Heritage

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- Pre Medical facility
- Medical support staff
- Availability of doctor.

Results of one sample t-test for the medical services construct

## T-Test

[DataSet1]

### One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Country Infra"	90	2.67	1.307	.138
Travel	90	3.06	1.074	.113
Immigration facility	90	2.97	1.043	.110
Climate	90	2.98	1.315	.139

### One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Country Infra"	-2.420	89	.018	-.333	-.61	-.06
Travel	.491	89	.625	.056	.17	.28
Immigration facility	-.303	89	.763	-.033	.25	.19
Climate	-.160	89	.873	-.022	.30	.25

H3: Does country factors affects medical tourist to choose India for medical care.

For testing the above Hypothesis, we have run the single t – test for below 4 variables after gathering 90 responses from the survey.

- Immigration facility
- Country Infrastructure
- Country climate
- Tourism Option

## RESULTS

### T-Test

[DataSet1]

### One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Premedical Facility	90	2.93	1.314	.138
Post treatment	90	3.37	1.276	.134
Medical support staff	90	3.03	1.156	.122
Availability of doctor	90	3.08	1.124	.118

### One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Premedical Facility	-.481	89	.631	-.067	-.34	.21
Post treatment	2.726	89	.008	.367	.10	.63
Medical support staff	.274	89	.785	.033	-.21	.28
Availability of doctor	.656	89	.513	.078	-.16	.31

## IMPLICATIONS

## **The three main hypotheses were the following**

1. Whether Medical quality affects medical tourist to choose India for medical care.
  - We tested three variables and found that for the all three variables defining the above construct the t value is coming to be more than .05 for the 95% confidence interval and test value = 3. So we can conclude that H1 holds true and should be accepted.  
In other words, Medical Quality is important factor for increasing the medical tourism in the India.
2. Whether Medical service affects medical tourist to choose India for medical care.
  - We tested four variables and found that for the out of four for three of the variables defining the above construct the t value is coming to be more than .05 for the 95% confidence interval and test value = 3. So we can conclude that H2 holds true and should be accepted.  
In other words, Medical Service is important factor for increasing the medical tourism in the India.
3. Whether Country factors and services affects medical tourist to choose India for medical care. – We tested four variables and found that for the out of four for three of the variables defining the above construct the t value is coming to be more than .05 for the 95% confidence interval and test value = 3. So we can conclude that H2 holds true and should be accepted.

In other words, Country factors and services is important factor for increasing the medical tourism in the India.

Overall, we can say that factors other than cost benefits are also important for increasing the Medical tourism of the country.

## **CONCLUSIONS**

We hypothesized 3 hypotheses about the increase in medical tourism in India by focusing on Medical Quality provided, Medical Services provided and Country factor and services like immigration, infrastructure etc. suggested that the patients do consider all these factors also apart from cost before choosing the medical tourism destination. So for India to improve the medical tourism industry they should work on these factors as well.

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## An Awareness and Impact of Tibetan Singing Bowl Sound Meditation on Stress, Anxiety, Pain and Overall Wellbeing of an Individual – Case Study of Vsit

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### ABSTRACT

*Overall well-being of an individual is the experience of health, happiness, satisfaction, prosperity and socially connected. It is often observed that in this era of Technology and sophistication, people are running the bushes to accomplish the goals and to sustain in competitive environment. This leads to stress and anxiety giving rise to bodily pain thus affecting overall well-being of an individual. This study aims to analyse the impact of sound mediation using Tibetan singing bowls on the overall well-being of an individual. This study is based on primary data collected from 35 respondents to know the level of awareness and evaluate the impact of sound meditation on the health. Many scientific case studies have proved that there is direct positive impact of sound vibrations on the physical ailments and health is improved after the sound mediations.*

**Keywords:** Sound Mediation, Stress, Anxiety, Tibetan Singing Bowl, Overall well being

### 1. INTRODUCTION

United News of India (UNI) has published the survey report conducted by Cigna's 360 well-being survey 2019 mentioning that India's 82% of population suffers from high stress level. Dictionary define Stress as “*physical, mental, or emotional strain or tension*” or “*a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize.*” One can experience stress from environment, thoughts or body. Health problems caused by stress include: Depression and anxiety; Pain of any kind; Sleep problems; Autoimmune diseases; Digestive problems; Skin problems; Heart disease; Weight problems; Reproductive issues, thinking and memory problems. Anxiety is a feeling of fear. It is body's natural response to stress. It causes both physical and psychological symptoms like feeling nervous, restless or tense, having an increased heart rate, Sweating, Trembling and having a sense of impending danger, panic or doom.

To overcome stress and anxiety meditation has proved the benefits since ages. Meditation is both a skill and an experience to cultivate awareness and compassion. It helps to train our mind to discover calmness, contentment and compassion. Research suggests that daily meditation may alter the brain's neural pathways, making you more resilient to stress,” says psychologist Robbie Maller, PhD, a Chicago health and wellness coach. Individuals practices any of these meditations types for peaceful life: mindfulness meditation, spiritual meditation, focused meditation, movement meditation, mantra meditation and Sound meditation

Sound meditation is a type of deepening meditation which uses sound instruments to ease depression, stress, body pain and anxiety. The beautiful sounds of Tibetan Singing bowl, Tingsha bells, sea rattle, ocean drum brings balance and harmony to the body, promote positive energy and is a powerful way to cultivate a sense of well-being.

### 2. METHODOLOGY

This study aims to find out the awareness of Sound meditation among faculty members and evaluate the impact of Sound vibrations from Tibetan singing bowl on health. This is Descriptive type of research. Target group for study was VSIT faculty members. 57 faculty members had participated in Sound Spa workshop conducted on 19<sup>th</sup> October 2019 for one hour. Out of which I received responses from 35 faculty members. After the session participants were provided with feedback form which comprised of 19 questions on stress, anxiety and overall well-being. Percentage method is used to arrive at conclusions.

### 3. OBJECTIVES OF THE STUDY

1. To find out the awareness towards sound meditation
2. To understand the concept & scientific procedure involved in imparting session.

3. To study the effectiveness of Sound meditation on health.
4. To study the impact of sound meditation on health w.r.t. stress, anxiety, pain and overall well being

## 4. EVOLUTION OF SOUND MEDITATION

Sound healing dates back to pre-historic times. In the ancient mystery schools of Greece, India, Egypt and other centre of knowledge, the use of sound and music for healing was a highly developed sacred science. In India, Sanskrit mantras were chanted to balance chakras and heighten consciousness. Pythagoras is considered as 'Father of Music and Harmonics'. He discovered the musical intervals to heal using sound and harmonic frequencies. Through music, Pythagoras performed what he called "soul-adjustments" by aligning Souls to their divine nature. Stringed instruments of specific frequencies were made to produce layered musical intervals. He recognized that music was an expression of "HARMONIA", the Divine principle that brings order to chaos and discord. He discovered that music can bring the faculties of the Soul into harmony, compose and purify the mind, heal the physical body, thus restoring & maintaining perfect health. "This harmonic melody was the result of dissimilar and varying sounds, speeds, magnitudes and intervals arranged with reference to each other in a certain musical ratio producing a convoluted motion most musical and gentle."

## 5. SCIENTIFIC STUDIES ABOUT SOUND HEALING

Dr. Mitchell Gaynor, director of Medical Oncology and Integrative Medicine, the Cornell Cancer Prevention Center in New York said that "*If we accept that sound is vibration and we know that vibration touches every part of our physical being, then we understand that sound is heard not only through our ears but through every cell in our bodies. One reason sound heals on a physical level is because it so deeply touches and transforms us on the emotional and spiritual planes. Sound can redress imbalances on every level of physiologic functioning and can play a positive role in the treatment of virtually any medical disorder.*"

According to Alison Ross, a sound healer says that "*Sound healing works on vibration. Everything is a vibration. Instruments are set with a definite frequencies. Sound healing allows your body to heal itself by slowing down your brain waves, which affect every cell in your body, shifting them from diseased to being in ease. It's just aligning it with whatever you need.*"

Dr. George Patrick, chief of recreation therapy in the Rehabilitation Medicine Department Clinical Centre of the National Institutes of Health (NIH) conducted a program of relaxation for pain and symptom-reduction to see the effects vibroacoustic (vibrations) therapy had on patients with various medical conditions. The study consisted of 272 patients with myriad of diagnoses from "cancer, heart, lung, and blood disorders, infectious diseases, mood disorders, and miscellaneous conditions". He determined that a 22-minutes session resulted in a "cumulative reduction of pain and symptoms by 53%". In addition, other side effects such as tension, fatigue, pain, headache, and nausea were reduced after the therapy.

Dr. David Simon, medical director of the Deepak Chopra centre in California, as quoted in the Underground Health Reporter, "*found that sound vibrations from Tibetan bowls and chanting are chemically metabolized into 'endogenous opiates.' These substances act on the body as internal painkillers and healing opiates.*"

## 6. SOUND MEDITATION INSTRUMENTS & COMPONENTS

Sound meditation can be practiced using the instruments like: Tibetan Singing Bowls, Tibetan Tingsha Cymbals, Tibetan Meditation Gong, Dorje Meditation Bell, Bell Wind Chimes, ocean drum, sea rattles, hope rattle. We make use of Tibetan Singing Bowls frequently for the meditation. These bowls are hand-made and make use of Seven metals (Gold, Silver, Copper, Tin, Mercury, iron & lead). These Bowls are tuned to the frequency of Each Chakra representing their Biz mantra, which lend their unique frequency to the vibration of the bowls.

## 7. SOUND MEDITATION PROTOCOL

For the Sound Spa workshop, three sessions were taken of 20 participants per batch. Total 57 participants were present for the workshop. Participants were asked to bring yoga mats on which to lie down to receive the vibrations of Tibetan singing bowls. They were asked to lie down keeping their heads pointed towards musical instruments and if they wished to fall asleep, they were allowed to sleep. Further they were ask to observe any sensations they felt in the body during the meditation. All participants were asked to relax full body and then sound meditation began.

Four Tibetan singing bowl representing Crown chakra, Third Eye chakra, Throat chakra and Heart chakra were used along with Tingsha bell, ocean drum and hope rattle. During an hour session, first 20 minutes theory on Sound meditation was discussed and then practical demonstration of sound vibrations was done. Each Tibetan singing bowl was used for 10 minutes by tapping or striking the bowls with mallet. The instruments were played in regular sequence : Ocean drum to clean the energy, each chakra bowls were hit to the tuned frequency using mallet for 10 minutes followed by Tingsha bell used for grounding purpose. Later the participants were asked to relax and share their experience. At the conclusion of the meditation, participants were asked to gently become aware of their surroundings and share their feedback.

## 8. WORKING OF SOUND MEDITATION ON BODY

Sound of Tibetan singing bowl heals human body by sending vibrations through cell. External vibrations cause a sympathetic resonance in the cells which is carried by water. The bowl vibrations are soothing enough to calm the nervous system yet powerful enough to travel deep into the body to penetrate the bones. Tibetan Bowl Sound practitioner taps the bowls in certain rhythms creating an entrancing energy.

## 9. BENEFITS OF SOUND MEDITATION ON HEALTH

Sound healing is the practice of using vibration frequencies to repair damaged tissues and cells within the body. It works on the dictum that all matter is vibrating at specific frequencies, and sickness, disease, depression, and stress cause human beings to vibrate at a lower frequency. Following are few benefits of Sound meditation:

1. Relief from stress
2. Relief from migraines
3. Boost in confidence
4. Gives you more focus approach
5. More energy
6. Improved relationships with others
7. Think more clearly
8. Improve organization skills
9. Improved attention span
10. Get relief from common ailments like hypertension, stomach pain, depression, and joint pains, stress and anxiety.

## 10. DATA ANALYSIS AND FINDINGS

After one hour session feedback was collected. The questionnaire was given to all 57 participants, of which 35 responded to the questionnaire. Following are the findings:

- i. Out of 35 respondents, 74% were female and 26% were male.
- ii. This study mainly focused on awareness of Sound meditation. It was observed that less than 5% of the respondents were aware about Sound meditation, whereas others were unaware.
- iii. The frequency of attending any meditation was only once and 90% of respondents have attended meditation.
- iv. Before the Sound meditation session respondents were asked their preference to attend sound meditation, for which it was observed that 40% of respondents wanted to attend sound meditation for releasing stress, 40 % wanted to feel positive, 20% wanted to release their body pain.
- v. After the session was conducted, it was observed that 6% of respondents attended sound meditation to reduce back pain, 17% of respondents attended sound meditation to reduce leg pain, 11% of respondents attended sound meditation to cure stomach disorders. 49% of respondents attended sound meditation to combat stress, 8% of respondents attended sound meditation to reduce migraine problem and 9 % of respondents attended sound meditation to were not having any specific reason.
- vi. It is further observed that 26% of the respondents were suffering from above ailments for less than 6 months, 11% of the respondents for a period of 6 months to one year, 6% of the respondents suffered for

period of one to two years while 40% of the respondents experience these ailments for more than two years. 17% of the respondents did not have any ailment at the time of workshop.

- vii. This study also aims to find out preference towards medicines consumed to cure ailments, of which 15% of respondents prefer taking homeopathy medicine, 40% of respondents prefers allopathic medicine, 11% of respondents prefers Ayurvedic medicines and 11% of respondents prefers Holistic approach to treat ailment, while 23% of the respondents prefer other options.
- viii. Respondents were asked the duration for consuming their preferred medicines. Observations indicate 34% consumed medicines for less than 3 months, 23% consumed medicines for more than 12 months, 11% consumed medicines for period of 6 months to 12 months, 6% consumed medicines for period of 3 months to 6 months, while 26% reported of not taking any medicines.
- ix. Respondents were asked the intention to participate in this workshop. It is observed that 23% intended to participate for reduction in pain, 43% intended for stress management and 34% intended to feel positive in their life.
- x. The study aims to find out the impact of sound meditation on the health of an individual. Following are the observations made:

Outcome of Sound meditation	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Total
Reduction in pain	9%	62%	29%	nil	nil	100%
Reduction of stress	23%	51%	26%	nil	nil	100%
Overall wellness	9%	69%	23%	nil	nil	100%
Feeling positive	29%	63%	9%	nil	nil	100%
Spiritual connect	14%	34%	43%	9%	nil	100%
Feeling light	11%	66%	20%	3%	nil	100%
Feeling heaviness in body	3%	11%	34%	49%	3%	100%

From the above table, it is observed that Sound meditation was effective maximum in feeling positive and next is reducing stress levels after the session. 29% of respondent strongly agreed to the feeling of positive and 23% of respondent strongly agreed in reduction of pain. 62% of the respondents agreed that they felt reduction in bodily pain, 69% agreed that they felt overall wellness. 66% of the respondents felt light after the session. 49% of respondents has disagreed the feeling of heaviness which indicates less receptivity towards sound vibrations.

## 11. LIMITATIONS

This research can be improved by having more participants from different locations. Also few respondents can be taken for pilot study representing the effects of sound meditation on specific ailments. Few questions related to stress and anxiety can be added and evaluated on 5 point scale.

## 12. CONCLUSION

After the study it is concluded that respondents has tremendously benefited from Sound meditation. Tibetan Singing bowls sound meditation helps an individual at cellular level to reduce bodily pain, anxiety and stress. With one session of this meditation, it is proved that stress can be easily reduced. For stress management regular meditation will help individual and can feel enhanced energy levels.

## 13. SUGGESTIONS

- i. To increase the awareness by promoting Sound meditation through workshops in colleges and corporates.
- ii. *To manage stress, regular sound meditation will alleviate and relax mind and rejuvenates the system.*
- iii. *Frequent meditation will promote health aspects of an individual by reducing bodily pain and anxiety.*
- iv. *Sound Therapy centres can be set up at strategic locations to enable people to avail meditation.*

***“Sound is the force of creation, the true whole. Music then, becomes the voice of the great cosmic oneness and therefore the optimal way to reach this final state of healing.”*** - Hazrat Inayat Khan (1882-1927)

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## A study of the impact of academic stress on psychology and health of generation Z

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### ABSTRACT

Stress has become an important topic in Academic circles. College students have many obstacles to overcome in order to achieve their optimal Academic performance. It takes a lot more than just studying to achieve a successful college career. The objective of the study is to explore the components of academic stress among the degree self-financing students. Different stressors such as time management, financial problems, sleep deprivation, social activities, placements, family and individual high expectations are some of the components of academic stress. Stress in academic institutions can have both positive as well as negative consequences if not well managed. This paper aims to study and explore the components of academic stress among the degree self-financing students and suggest ways to manage academic stress. The sample comprises of 81 students pursuing degree self-financing from various colleges in Mumbai city of Generation Z. Data was collected through self-designed Questionnaire.

*Keywords: Generation Z, Academic stress, Stressors, Time management and Academic Performance.*

### 11. INTRODUCTION

#### Stress

Stress is the body's reaction to any change that requires an adjustment or response. The body reacts to these changes with physical, mental, and emotional responses. Stress is a normal part of life. You can experience stress from your environment, your body, and your thoughts. Even positive life changes such as a promotion, a mortgage, or the birth of a child produce stress.

**Now a days a major cause of concern amongst the academic circle & the parents is the stress amongst Gen Z & the consequences of stress on their physical as well as psychological health.**

	B	X	Y	Z
	Baby boomer 1940–59	Gen X 1960–79	Gen Y (millennial) 1980–94	Gen Z 1995–2010
Context	<ul style="list-style-type: none"><li>Postwar</li><li>Dictatorship and repression in Brazil</li></ul>	<ul style="list-style-type: none"><li>Political transition</li><li>Capitalism and meritocracy dominate</li></ul>	<ul style="list-style-type: none"><li>Globalization</li><li>Economic stability</li><li>Emergence of internet</li></ul>	<ul style="list-style-type: none"><li>Mobility and multiple realities</li><li>Social networks</li><li>Digital natives</li></ul>
Behavior	<ul style="list-style-type: none"><li>Idealism</li><li>Revolutionary</li><li>Collectivist</li></ul>	<ul style="list-style-type: none"><li>Materialistic</li><li>Competitive</li><li>Individualistic</li></ul>	<ul style="list-style-type: none"><li>Globalist</li><li>Questioning</li><li>Oriented to self</li></ul>	<ul style="list-style-type: none"><li>Undefined ID</li><li>“Communaholic”</li><li>“Dialoguer”</li><li>Realistic</li></ul>
Consumption	<ul style="list-style-type: none"><li>Ideology</li><li>Vinyl and movies</li></ul>	<ul style="list-style-type: none"><li>Status</li><li>Brands and cars</li><li>Luxury articles</li></ul>	<ul style="list-style-type: none"><li>Experience</li><li>Festivals and travel</li><li>Flagships</li></ul>	<ul style="list-style-type: none"><li>Uniqueness</li><li>Unlimited</li><li>Ethical</li></ul>

#### Gen Z

Generation Z, or Gen Z for short, is the demographic cohort succeeding the Millennials. Gen Z is the newest generation to be named and were born between 1995 and 2015. They are currently between 9-24 years old.

## IMPACT OF STRESS ON HEALTH

The human body is designed to experience stress and react to it. Stress can be positive, keeping us alert, motivated, and ready to avoid danger. Stress becomes negative when a person faces continuous challenges without relief or relaxation between stressors. As a result, the person becomes overworked, and stress-related tension builds. The body's autonomic nervous system has a built-in stress response that causes physiological changes to allow the body to combat stressful situations. This stress response, also known as the "fight or flight response", is activated in case of an emergency. However, this response can become chronically activated during prolonged periods of stress. Prolonged activation of the stress response causes wear and tear on the body – both physical and emotional.

Stress that continues without relief can lead to a condition called distress – a negative stress reaction. Distress can disturb the body's internal balance or equilibrium, leading to physical symptoms such as headaches, an upset stomach, elevated blood pressure, chest pain, sexual dysfunction, and problems sleeping. Emotional problems can also result from distress. These problems include depression, panic attacks, or other forms of anxiety and worry. Research suggests that stress also can bring on or worsen certain symptoms or diseases. Stress is linked to 6 of the leading causes of death: heart disease, cancer, lung ailments, accidents, cirrhosis of the liver, and suicide.

Stress also becomes harmful when people engage in the compulsive use of substances or behaviours to try to relieve their stress. These substances or behaviours include food, alcohol, tobacco, drugs, gambling, sex, shopping, and the Internet. Rather than relieving the stress and returning the body to a relaxed state, these substances and compulsive behaviours tend to keep the body in a stressed state and cause more problems. The distressed person becomes trapped in a vicious circle.

## WARNING SIGNS OF STRESS

Chronic stress can wear down the body's natural defences, leading to a variety of physical symptoms, including the following:

- Dizziness or a general feeling of "being out of it."
- General aches and pains.
- Grinding teeth, clenched jaw.
- Headaches.
- Indigestion or acid reflux symptoms.
- Increase in or loss of appetite.
- Muscle tension in neck, face or shoulders.
- Problems sleeping.
- Racing heart.
- Cold and sweaty palms.
- Tiredness, exhaustion.
- Trembling/shaking.
- Weight gain or loss.
- Upset stomach, diarrhoea.
- Sexual difficulties.

## FACTORS THAT IMPACT YOUR STRESS LEVEL

Medical research has found seven factors that contribute to your overall stress level. The seven stress risks are:

1. depression
2. sleep disorders
3. distress

4. disturbed sleep
5. loss of sense of control
6. chronic stress
7. Stressful life events in the past year. Stressful life events may include good events such as a wedding or a new job or bad events such as a death, loss of a job or divorce.

## CAUSES OF STRESS

The situations and pressures that cause stress are known as stressors. We usually think of stressors as being negative, such as an exhausting work schedule or a rocky relationship. However, anything that puts high demands on you can be stressful. This includes positive events such as getting married, buying a house, going to college, or receiving a promotion.

Of course, not all stress is caused by external factors. Stress can also be internal or self-generated, when you worry excessively about something that may or may not happen, or have irrational, pessimistic thoughts about life.

Finally, what causes stress depends, at least in part, on your perception of it. Something that's stressful to you may not faze someone else; they may even enjoy it. While some of us are terrified of getting up in front of people to perform or speak, for example, others live for the spotlight. Where one person thrives under pressure and performs best in the face of a tight deadline, another will shut down when work demands escalate. And while you may enjoy helping to care for your elderly parents, your siblings may find the demands of caretaking overwhelming and stressful.

Common **external** causes of stress include:

- Major life changes
- Work or school
- Relationship difficulties
- Financial problems
- Being too busy
- Children and family

Common **internal** causes of stress include:

- Pessimism
- Inability to accept uncertainty
- Rigid thinking, lack of flexibility
- Negative self-talk
- Unrealistic expectations / perfectionism
- All-or-nothing attitude

## 12. OBJECTIVES

- To study the Components of Academic Stress.
- To study the causes of Academic Stress.
- To study the impact of stress on the Academic performance.
- To study the impact of stress on psychology & health of generation Z.

## 13. HYPOTHESIS

- Stress Leads to Psychological problems.

## 14. METHODOLOGY & SOURCES OF DATA

- **Universe of Study**

Universe of study for the purpose of the research shall be Self financing course of Mumbai City only.

- **Limitation of Study**

Respondents only from a section from selected colleges in Mumbai City. The research is based on only 81 respondents.

- **Sample Frame**

The primary data collected from selected colleges and responses were received from 81 Respondents.

- **Tools used for data collection**

The pre-designed Questionnaire was circulated for Data collection.

- **Secondary Data**

Secondary data collected from official information from the documents of various colleges, Journals, Magazines, Report, etc.

## 15. SUMMARY OF FINDINGS & INTERPRETATION

The findings though restricted to a Small, Non-random, offer a measure of optimism that given the right support system from Home, Educational institutions and Society. The total sample size is 81 Respondents. The Respondents consist of different self-financing courses like BAF, BMS, BBI, BFM & BscIT from various colleges across Mumbai.

- 79% Respondents have more than 6 subjects in their academics.
- 58% Respondents can manage their academic load wherein 35% are unable to.
- 70 % + Respondents are able to balance their student life with their personal life which shows the majority due to the support of their college and proactiveness of Faculty as mentors effectively.
- 11% Respondents are in 'May be' situation which shows a sense of confusion.
- Through the Result of Responses, it shows 42% feels that stress has impact on their overall performance.
- About 58% Respondents shows a positive sign of stating that Multi-tasking is manageable for them.
- Time management seemed to be the biggest concern for the Respondents (90%)
- Stress management plays an important role in overcoming Stress (80%)
- Stress cause Physical Discomfort in which 32% Respondents directly said 'Yes' wherein 46% is in 'sometimes' situation.
- Stress cause Mental Discomfort in which 42% Respondents directly said 'Yes' wherein 27% is in 'sometimes' situation.
- Majority students (53%) are able to manage their stress level.
- 70% prefers Friends as a best companion for stress management compared to Family and Counsellor. There seems to be a lack of comfort zone with parents or counsellors may be due to social stigma.

## 16. CONCLUSION

The research shows that there is academic stress caused to students. Stress causes a lot of physical & psychological problems to students if not properly managed. The positive outcome of the study is that to a large extent students are able to manage their stress. Some also feel that stress has a positive impact on their performance while others feel that their performance is negatively affected. Majority students can manage their Academic and Personal life. Even though there is an impact of stress academic stress in their overall performance, students are able to cope-up. The research also shows that multi-tasking is manageable for majority students which again shows the good sign from students' performance.

Stress is due to Major factors like Time Management, Negative Self-talk, Unrealistic expectations, depression, Sleep disorders, Distress etc.

A disturbing outcome is that for stress management students are more comfortable with friends rather than parents, relatives or professional help.

The Hypothesis is proved as data shows that there is direct relation between stress of students and Psychological level.

## 17. SUGGESTIONS

- Mentors & faculty should be actively involved with the students and their issues & challenges.
- There should be more awareness about stress and its management
- Counselling to parents so that the wards are more comfortable in sharing their problems.
- Special guidance for time management, positive energy realistic expectations.
- Promotion & creating awareness of taking proper care of health as it directly has an impact on stress.

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## Effects of Digital Life on Psychological Health of Youth

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### **ABSTRACT**

*The aim of this paper is to explore the relationship between digital media use and psychological health of youngsters. We explore the effects of increased use of social media on the lives of various age groups of people. Technology, in general has its advantages and disadvantages. In our paper, we bring out that technology affects youngsters more in a negative manner.*

*Excessive use of social media results into deterioration of psychological health. In addition, excess use of social media results in negative outcomes such as increased anxiety, depression, loneliness, compulsive behaviour.*

*This paper focuses on various factors such as Role of iDisorder in individual's life and how social media results in delaying milestones in child's development at various stages.*

**Keywords:** Social media, Psychological health, Digital Media

### **1. INTRODUCTION**

**Psychological health** involves a normal emotional, behavioural, and social maturity of a person. Such a person is in a **healthy state** of mental well-being when they function normally in society and during everyday events.

A **constant checker** is a person who constantly, almost obsessively, checks their emails, texts, and social media accounts continuously. In our research paper we have considered various social media applications such as Instagram, Snapchat, Facebook etc.

Our paper identifies connections between social media use and its outcome on mental health. The constant use of social media has made house in the minds of youngsters about the false social status and about the fascinating life style of other people.

### **2. OVERVIEW**

Social media refers to websites and applications that are designed to allow people to share content quickly, efficiently, and in real-time. Many people define social media as apps on their smartphone or tablet, but the truth is, this communication tool started with computers. This misconception stems from the fact that most social media users access their tools via apps.

Social media has given teens the ability to instantly connect with others and share their lives through photos, videos and status updates. Teens themselves describe these platforms as a key tool for connecting and maintaining relationships, being creative, and learning more about the world. But they also must contend with more negative aspects of social media use, such as drama and bullying or feeling pressure to present themselves in a certain way.

Youngsters discuss their dating lives, their family, their emotions and their religious or political beliefs.

Many of the users feel pressure to only post content that makes them look good to others or that will get lots of comments or likes.

Users are likely to experience serious psychological distress, associated with depression or other mood and anxiety disorders. When tiny bits of information pop up on your cell phone and on Facebook feed.

Social media can make kids feel inadequate due to the “in-your-face” friend tallies, status updates, and pictures of others having a good time.

For young people found it difficult to relax during night time because of social media use, reducing their brain's ability to prepare for sleep. Sleep loss works in a vicious cycle of reinforcement with mental health; that

is, that loss of sleep due to night time social media use can lead to poorer mental health, and poor mental health can lead to intense night time use and sleep loss.

Social media can also heighten anxiety by increasing users' ability to keep up to date with the activities of their social circles. The popular concept of Fear of Missing Out (FOMO) refers to 'a fear of not getting desired amount of likes by their friends' and is 'characterized by the desire to stay continually connected with what others are doing'. FOMO has been linked to intensive social media use and is associated with lower mood and life satisfaction. We have become more aware of what we are missing out on, for example, seeing photos of friends having a good time together in one's absence. 'Always on' communication technology can cause feelings of anxiety, loneliness and inadequacy through highlighting these activities, compelling users to stay continually engaged and up to date due to fear of not being involved.

### **3. OBJECTIVES OF THE STUDY**

1. To assess whether social media use is associated with depressive symptoms in youngsters.
2. To investigate potential explanatory pathways for observed associations – via online harassment, sleep, self-esteem and body image.
3. To conduct a survey amongst youth (age group of 18-24 years); and find out the current trend.

### **4. FINDINGS**

Brief introduction, advantages and disadvantages of the most popular social media applications are discussed below:

#### **(1) Tik- tok**

Tik -Tok is a social platform which enables you to create 15 second lip sync videos using its background music. Tik- Tok was launched in 2016 and since then it has become the most popular video creating platform for youngsters. Young children are becoming addicted to this social platform and they are ready to do anything to draw the attention of other users. Children are using false identities.

Tik -Tok doesn't follow any policy to stop young kids from joining the community of adults. Our young generation is fond of new things and Tik- Tok seems an advanced invention and they are attracted towards it and spoiling their IQ.

#### **(2) Facebook:**

Beside the benefits of **Facebook** use, negative **impacts** of its use have also been identified, including: impaired **academic performance**, health problems, personal relationship problems and social dysfunction.

According to a study it was reported that students that devotes bigger number of hours on Facebook tends to score low GPAs with poor overall performance. Another study revealed that substantial Facebook use is common among students with less demanding scholastic accomplishments.

#### **(3) WhatsApp**

WhatsApp is an amazing application, and with the help of it we can connect ourselves to the society and the whole world. It is an effective medium for the flow of information and ideas. This application is advantageous for us from many ways which occupies a major part of our day-to-day life. However, this app has emerged as an important medium for social networking and sharing of information and ideas, even it has some harmful effect on the life of youth. Hence, it is essential to know how it is affecting the life of youth and the society at large.

Examining it empirically, it is found that **WhatsApp** has also a profound negative **impact** on **youth** and adversely affects their education, behaviour and routine lives. It messes up much of study time of students and spoils their spelling skills and grammatical construction of sentences.

#### **(4) Snap-Chat**

It is an over rated extremely popular private messaging app for sharing photos and short live videos having a touch of fun elements attached with it.

Snapchat has mechanisms in place to incentivize teens to become daily users with a phenomenon called the Streak

Experts say Streaks can create a concerning hierarchy of friendship that can leave some teens afraid to disappoint others if they drop a Streak (Streak is given to users who have sent each other Snaps consistently for two days or more). A fire emoji will appear next to a friend's name along with a number. The number indicates how many days you have consistently messaged that user back and forth.

## (5) Instagram

Instagram has proven itself as a boon for the e-commerce businesses. One can share their product images and videos along with appropriate hashtags to reach out to the maximum number of audience. Instagram is associated with issues of self-awareness.

It acts as a platform where users mimic other lifestyles, cultures, & behaviors. It hampers career progression to some people. The virtual world tends to compromise some sense of happiness.

People react to situations and events that they have seen on Instagram. Unhealthy competition and frantic race for success with strangers

**Table-1: Survey of Social Media Usage among Youth**

Sr. No	Survey Element	
1	Which of the following application is the most liked one?(Out of 120)	
	1)Instagram	65
	2)Tik- tok	15
	3)Facebook	10
	4)Snap Chat	30
2	How many hours a day do you spend on these social media apps?	
	1) 15-20 Hrs	45
	2) 10-12 Hrs	55
	3) Less than 5 hours	20
3	After the event takes place (such as family gathering or picnic, After you purchase any new object (such as mobile phone, bike etc.) How fast do you upload a picture?	
	1)Within Minutes	95
	2)On that day	20
	3) Never	05
4	Do you feel happy by the likes that you get in your profile?	
	1) Yes	80
	2) Doesn't Matter	40
5	Do you discuss about the post of the profile with your friends?	
	1)Yes	110
	2) No	10

This survey was conducted for students of age group between (18-24) group.

As students are becoming more tech savvy the use of social media is also increasing and unknowingly it is effecting the mental health of a student.

## 5. CONCLUSION

Social media usage patterns impact subsequent users, specifically user levels with self-esteem and well-being. Social media applications such as Instagram, tik-tok has rapidly gained in popularity, among youngsters of age group 18-24.

Our study illustrates the correlation between intensity of use and user outcomes, much is still unknown regarding this relationship. The existing literature notes that there is a relationship between social media use and depressive symptoms.

Our paper attempts to understand the relationship between different forms of social media usage and their subsequent effects on young adult users.

Spending long hours chatting in social media sites also decreases productivity amongst the youths. This in turn causes the youths not to be self-dependent and instead depend on their parents and families for upkeep. The long hours wasted online on social media can be channeled to productive activities that can enable one earn a living or even acquire an education for instance through online tutorials and make good use of online research materials.

Social media may be affecting the mental health of someone you know in a negative manner. consider the following tips to balance social life and psychological health:

1. Turn off your notifications for at least a few hours each day (which you can gradually increase); put your phone in “Airplane” mode or “Do Not Disturb”.
2. Delete apps that contribute to unhealthy body image or other feelings of inadequacy. Add apps that help you feel better about yourself or inspire you to engage in healthy behaviors. Meditation apps can be a better use of your time, for example: Calm, Insight Timer, and Headspace. Use apps that block certain other apps and tell you about your usage. This will help to increase your awareness of how much you are engaging with social media and help you focus on other activities.
3. Use an alarm clock instead of relying on your phone as an alarm to prevent you from using your phone the minute you wake up.
4. Take a day off from social media to focus on other things. Sunday is a good suggestion since it is a day when you probably aren't in school or at work.
5. Consider putting your phone in grayscale. This makes your phone less enticing to look at. With the colorful apps and notifications changed to gray, they may be easier to ignore.
6. Set boundaries or only certain times when you can check your notifications.

These Applications can be utilized in an efficient way in order to promote the various business activities, to intellectually discuss among the group, students can show case their talent by making use of these applications.

Humans are social beings who desire group interaction, the rise of social media has been a fundamentally multifaceted phenomenon, the statistics suggesting that it will come to play an increasingly dominant role in our lives.

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## Growth of Ayurveda as a brand in India with focus on Patanjali

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### ABSTRACT

*Increased emphasis on healthy lifestyle and wellness, driven by a growth in chronic diseases, is augmenting the demand for Ayurveda in India, according to a report by Confederation of Indian Industry (CII) and PricewaterhouseCoopers (PwC). There is a fast proliferation of Ayurvedic/Herbal brands in the FMCG market which is a recent trend in the market. These brands are giving tough competition to the market share of the big MNCs. Ayurveda, originates in India but lost to the attractive products offered by the MNCs. Consumers are now substituting their daily purchases by ayurvedic brands. There is a paradigm shift in core Ayurvedic industries using technology as an enabler, to meet the increasing demand. Thus, the market offers immense potential for the Ayurvedic brands. Some of the existing Ayurvedic brands like Patanjali, Sri Sri Ayurveda etc. are becoming popular. This paper examines the factors contributing to the growth of Ayurvedic brands in the Indian FMCG market.*

*Keywords:* Ayurveda /herbal products, wellness, FMCG, technology, enabler.

### INTRODUCTION

Indian ayurvedic products market is expected to grow at a CAGR of 14% during 2019-2024. Ayurveda is an ancient science and healthcare system that has been adopted by cultures globally. Ayurveda analyses and cures diseases after understanding an individual's body type, heartbeat patterns, appearance, vision, etc. There are various protocols and treatments in the ayurvedic system to rectify ailments through the use of herbs, plants, exercise, diet and changes in lifestyle. Throughout the country, various segments of ayurvedic healthcare and personal care products are available. For personal care range, the market is divided into oral care, skin care, make-up, hair care and fragrances. Whereas, for the healthcare range, the market is segmented into ayurvedic nutraceuticals, ayurvedic medicines and dietary supplements. Corporations throughout the country are focusing on developing innovative ayurvedic products and generating awareness among consumers.

A key factor driving the Indian ayurvedic products market is increasing popularity of natural and organic medicines and their benefits among the consumers. Factors such as rising health concerns and awareness on the side-effects of western medicines is further driving the consumer preference for ayurvedic products in the country. Moreover, catalysed by economic growth and rising incomes, per capita expenditures on healthcare products have increased significantly over the past few years, creating a positive impact on the ayurvedic products market. Furthermore, the distribution network of ayurvedic products have improved significantly, increasing the accessibility of these products across both urban and rural regions. The government of India is also promoting the usage of ayurvedic products through awareness programmes and subsidies.

The classical works on Ayurveda describe it as, "It is that knowledge of life which deals elaborately and at length with conditions beneficial or otherwise to the humanity, and, to factors conducive to the happiness, or responsible for misery or sorrow besides indicating measures for healthful living for full span of life". Ayurveda is also Considered as 'Science of life'.

Ayurveda originated in India long back in Pre-Vedic period. Rigveda and Atharva-veda (5000 years B.C.), the earliest documented ancient Indian knowledge have references on health and diseases. Ayurved texts like Charak Samhita and Sushruta Samhita were documented about 1000 years B.C Ayurveda becomes one of the oldest systems of health care dealing with both the preventive and curative aspects of life.

According to Karnik (2016), The market size of Ayurvedic products in Asia's third largest economy is expected to grow at 15% between 2016 and 2020, according to Nomura, the Japanese broking firm.

Out of all FMCG sub-segments, the presence of ayurvedic/herbal brands is not seen equally across the board. It is felt most strongly in case of personal care category and the food and beverages sub-segment. Home-care

products are yet to witness the emergence of strong natural substitutes. Tobacco products and fast moving electronic goods are completely out of the purview of ayurvedic/herbal brands.

The key suppliers in Ayurveda are Dabur, Baidyanath, and Zandu, which together have about 85% of India's domestic market. These and a handful of other companies are mentioned repeatedly by various writers about the Ayurvedic business in India; a brief description is provided for them.

Patanjali Ayurved disrupted the Indian fast-moving consumer goods (FMCG) sector with nature-based products in various categories to challenge the dominance of companies such as Hindustan Unilever in the past three-four years. That has forced rivals, especially the multinationals, to rethink their portfolios to introduce matching products at similar price points to try and regain their market ranking, analysts said. This seems to be paying off, they said. The homegrown upstart has been most successful in staples such as ghee, flour, ayurvedic health supplements, toothpaste, edible oil and condiments but less so in noodles, biscuits, personal care, chocolates and juices.

Patanjali Ayurveda is the biggest success story in the recent past. Founded by yoga guru Ramdev, it is now among India's top 10 FMCG firms (by revenue) and is rapidly expanding. Patanjali products are free of many unhealthy chemicals—including Monosodium Glutamate—found in brands of many other FMCG majors. Patanjali has spread across a range of categories, from instant noodles and pasta to soaps and biscuits. According to Vyas (2016) "After Patanjali, existing FMCG players may face challenge from Sri Sri Ravi Shankar's Sri Sri Ayurveda". Other FMCG companies which were so long offering synthetic products are also taking the herbal/ayurvedic path to salvage their market share. This is evident from their recent strategies. Hindustan Unilever Limited has decided to launch its new range of Ayurveda based products under the brand name "Ayush".

Along with the natural and ayurveda focus, Patanjali has in the past pitted itself as the flag bearer of patriotism, contending that its foreign rivals have done little for India despite doing business here for a long time. "We want to be the No. 1 consumer goods company in India," says Acharya Balkrishna, CEO of Patanjali. "We regard our business as a new swadeshi movement, and want an Indian company to take back an industry long dominated by foreign companies."

## REVIEW OF LITERATURE

The term "Ayurveda" combines the two Sanskrit words "Ayur" which means life and "Veda" means science or knowledge (Gunjan et al., 2015). It is one of the most important traditional medicinal systems in India, with an established history of many centuries. The major focus of Ayurvedic medicine is to prevent illness and promote good health rather than fighting with disease in the body. According to Malviya and Tyagi (2016), "In shampoos, sales of Ayurvedic brands more than doubled to 194 per cent, while for MNCs, it declined to 15 per cent from 21 per cent earlier." Out of personal care products also, ayurvedic cosmetics need a special mention when it comes to talking about the growth of ayurvedic brands. Ayurvedic cosmetics refers to beauty products that use natural ingredients, rooted in a Hindu system of traditional medicine based on herbal treatments. According to Bundhun (2015) "The market for ayurvedic cosmetics products in India is expected to grow at a rapid pace over the coming decades. The market is only beginning to get populated with ayurvedic brands and it will be a while until it gets too crowded." These kind of facts and figures clearly indicate the acceptance and popularity of ayurvedic/herbal brands as an alternative to the synthetic ones in the category of personal care products.

## SWOT ANALYSIS OF PATANJALI

### Patanjali's Strengths

- Founding Father** – Baba Ramdev, a Hindu spiritual guru is the founding father of Patanjali. Baba Ramdev is the reason behind Patanjali's exponential growth. The spiritual guru serves as the brand ambassador and has used his popularity and fame to persuade consumers to buy his products. Through his influence and power, Baba Ramdev has managed to boost the growth of the company.
- Pricing Strategy** – The pricing structure of Patanjali's products gives it leverage over its competitors. The brand has successfully managed to capture the interest and loyalty of the Indian lower- and middle-class demographic. The products are priced at least **20-30%** lower than that of its competing rivals. It is difficult for Competitors and rivals to compete with Patanjali on such an aggressive pricing strategy.

3. **Launch of New Products** – Patanjali has recently launched a number of new products.. The company has ventured into the dairy sector and now offers cow milk, flavored milk, curd, buttermilk, and cheese. Additionally, Patanjali now also offers frozen vegetables like peas, sweet corn, and mixed vegetables. This puts Patanjali in direct competition with McCain. Patanjali also plans to launch its own packaged drinking water, named as **Divya Jal**. Furthermore, the company plans to offer urea free cattle feed and solar production.
4. **Ayurveda and Herbal** – Patanjali has intelligently utilized Ayurveda and herbal products. Its marketing strategy specifically promotes its herbal products highlighting the benefits of natural and organic materials. The Swadeshi products that are marketed by Patanjali are both loved and widely consumed by the Indian masses.
5. **Strong Distribution Channels** – Over 15,000 Patanjali outlets are operating across India, which gives the brand strong distribution channels. The brand sells its products through medical centers Patanjali Arogya Kendras and Patanjali Chikitsalayas and also through Swadeshi Kendras (non-medical centers). This has helped the brand to easily reach the masses and build trust and customer loyalty.
6. **Word of Mouth Marketing** – Patanjali has been utilizing word of mouth publicity. Patanjali was one of the very first brands to use this strategy. Word of mouth publicity proved to be beneficial for Patanjali with Baba Ramdev's yoga camp followers promoting and endorsing the brand. In recent years, the company has been pushing its products through all promotional campaigns. Furthermore, through the launch of the medical and non-medical centers, Patanjali has strengthened its market position.
7. **E-commerce** – Patanjali has an E-commerce advantage over its competitors. A lot of its products are sold through E-commerce platforms. Due to this, consumers can easily find Patanjali's products online.

## PATANJALI'S WEAKNESSES

1. **Reliance on Baba Ramdev** – The company relies heavily on Baba Ramdev himself. The man is not only a business magnate but also a public figure. The spiritual guru has been in and out of a lot of controversies.
2. **Current Pricing Strategy** – Patanjali needs to revise its current pricing strategy or else the company will fail to sustain itself. The current pricing strategy gives low-profit margins which are necessary for Patanjali's survival.
3. **Excessive Product Offerings** – Patanjali has way too many products in its portfolio. Some of these are profitable while others fail to generate any profit. Despite having such a diverse product portfolio only **5 or 6** products like shampoo and toothpaste generate high revenues. The company needs to discontinue low profit products or solidify them so they can generate substantial profits.
4. **Lower Margins for Distributors** – Patanjali's core focus is on volume and not on margins. It offers lower margins to distributors as opposed to other companies that deal in consumer goods. For this reason, the company is a demand run company.
5. **Limited presence in International Market** – Patanjali is a brand that has an International appeal due to its exotic outlook. However, it has mainly restricted itself in the Indian market. Baba Ramdev has an international audience, and he can provide an incentive in regions where his strongest demographic base is located like Nepal. Additionally, the company needs to target the younger Indian demographic that is internet savvy and technologically advance

## PATANJALI'S OPPORTUNITIES

1. **Natural & herbal products** – A number of people are now switching to organic and natural products. This is the perfect time for Patanjali to invest more in its organic farming sector, particularly in terms of raising awareness about its product's health benefits and health risk preventions.
2. **Global Markets** – The global markets provide a fertile ground for a company like Patanjali. Spirituality or anything related to mysticism is popular among the inhabitants of Africa, Asia, and the Middle East. The company needs to learn from Haldiram, Amul and Dabur, etc. and proceed with a similar plan of action. Due to Baba Ramdev, the company has a direct association with Yoga. The company can expand in regions where Yoga is a common practice like Far East Asia.

- Food Business** – The brand can open quick restaurants like Haldiram and offer edibles that use natural and organic ingredients. This can complement the company's offerings and help to generate bigger revenues. By offering food items, the company can establish a stronger image in the Indian market.
- Rural Expansion** – Currently, the company is not running extensive operations in the Indian rural areas, which are critical for every company. Patanjali must expand rurally and cater to the rural regions accordingly. It would be easier for the Patanjali to expand rurally as rural consumers prefer natural products that are affordable.

## PATANJALI'S THREATS

- Controversies** – Patanjali has seen its fair share of controversies. Most recently was its promotion of the “Putrajeevak Beej” that promised the **birth of a male child** to any family that purchases it. The severe backlash resulted in a government inquiry. Many politicians and activists recommended banning the sale of the product. It has tarnished the image of the brand and has affected its revenue.
- Negative publicity** – The company faced a major crisis when the Nepal Department of Drug Administration issued a public notice to Patanjali stating that they had found some of its medical products to be of “sub-standard quality.” The products had failed their microbial tests which were used to detect mold, bacteria, and other toxins. This crisis resulted in negative word of mouth that damaged the company's reputation.
- Increase in Competition** – Big companies like **Marco**, **HUL**, and **Dabur** already give Patanjali tough competition. Newer entrants in the market like Sri Ayurveda are also increasing the competition for Patanjali.
- Poor Harvest** – The Indian farming community depends on the weather and the monsoon season to grow their crops and ingredients. Climate changes can severely affect the production of major crops. This can endanger Patanjali that needs to create a backup plan if the country ever faces a natural disaster or bad climate.

## Patanjali products and the Competitors

BRAND	PRODUCT	PRICE	PATANJALI'S PRODUCT	PRICE
Colgate Palmolive India	Cibaca Vedshakti	₹50 for 175 g	Dant Kanti	₹40 for 100 g
Dabur India	Dabur Honey	₹122 for 250 g	Pure Honey	₹70 for 250 g
Dabur India	Dabur Amla hair oil	₹42 for 90 ml	Amla hair oil	₹40 for 100 ml
Himalaya Herbals	Purifying Neem face wash	₹110 for 100 ml	Neem Tulsi face wash	₹45 for 60 ml
GCPL	Godrej No. 1 Germ Protection	₹40 for 70gm (4)	Kanti Neem	₹15 for 75 g
HUL	Fair & Lovely Ayurvedic	₹120 for 50 g	Beauty cream	₹70 for 50 g
HUL	Lever Ayush Dandruff Naashak	₹325 for 200 ml	Kesh Kanti anti dandruff	₹110 for 200 ml
Marco	Parachute Advansed Ayurvedic	₹160 for 300 ml	Kesh Kanti oil	₹250 for 300 ml
Dabur India	Dabur Chyawanprash	₹295 for 1 kg	Chyawanprash	₹190 for 1 kg

Source: Outlook Business.

## OBJECTIVE OF THE STUDY

- To understand the growth of Ayurveda as a FMCG brand in India
- To study the growth in awareness of Ayurveda amongst consumers in Mumbai.
- To analyse the preference of Patanjali products amongst the consumers in Mumbai.

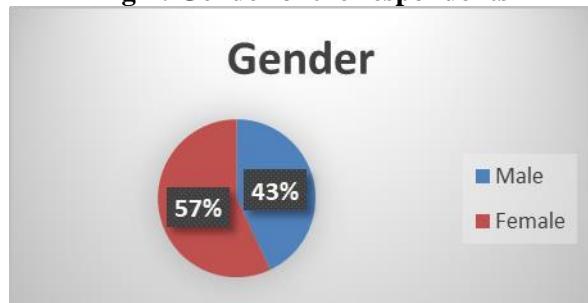
Sample size: 93

## RESEARCH METHODOLOGY

Nature of study is descriptive and analytical. The research is based on Primary and secondary data. Population is user of Ayurveda products in Mumbai. Convenience sample is used for data collection. Period of study is three months ( October – December 2019). Ratio tools used to analyse data. Charts have been used for representation of data. Primary data has been collected with the help of a questionnaire. Secondary data has been collected from reference books, articles and websites. Area of study is Mumbai.

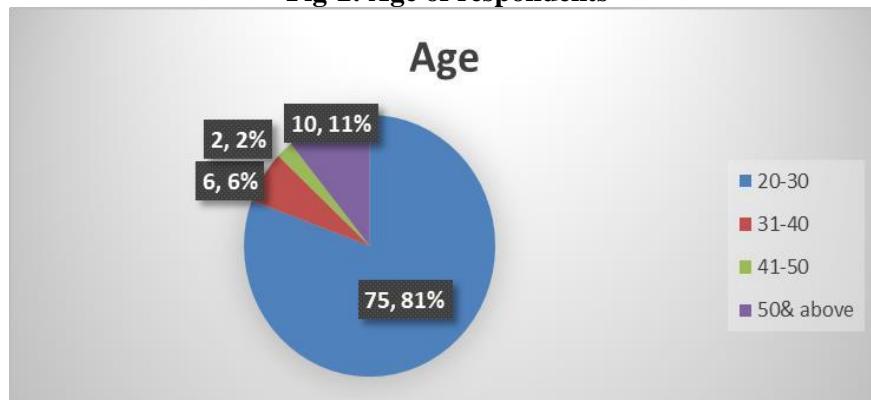
## DATA ANALYSIS

**Fig-1: Gender of the respondents**



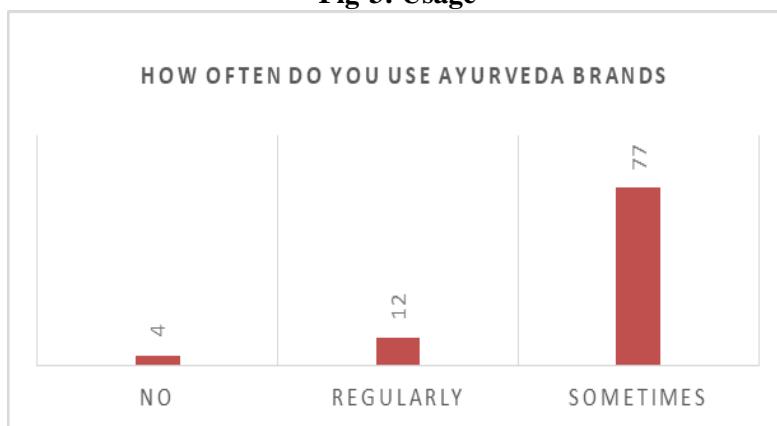
Out of 93 respondents 57% are Female and the rest are Male. So the awareness among female population is more than males.

**Fig-2: Age of respondents**



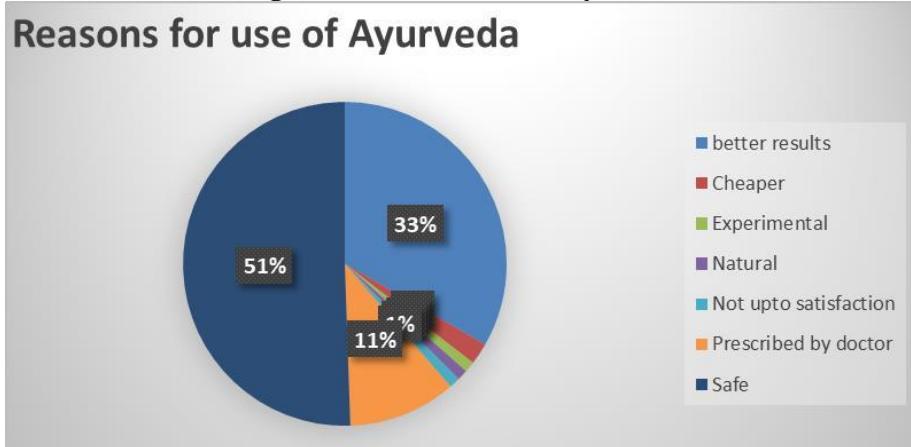
Majority of the respondents are from the age group of 20-30. 11% of the respondents are 50 and above. It is evident that more youth are aware of Ayurveda/herbal brands.

**Fig-3: Usage**



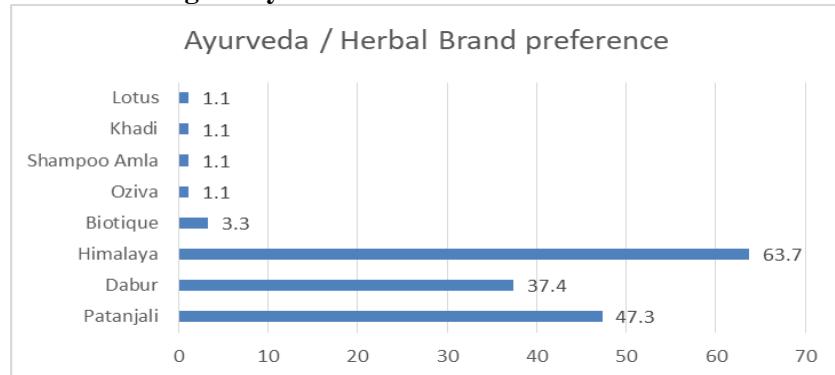
Majority of the respondents use Ayurveda or herbal brands sometimes. Only 12.9% of the respondents use it regularly. So there is scope for motivating the customers and the youth to use it regularly.

**Fig.4: Reasons for Use of Ayurveda**



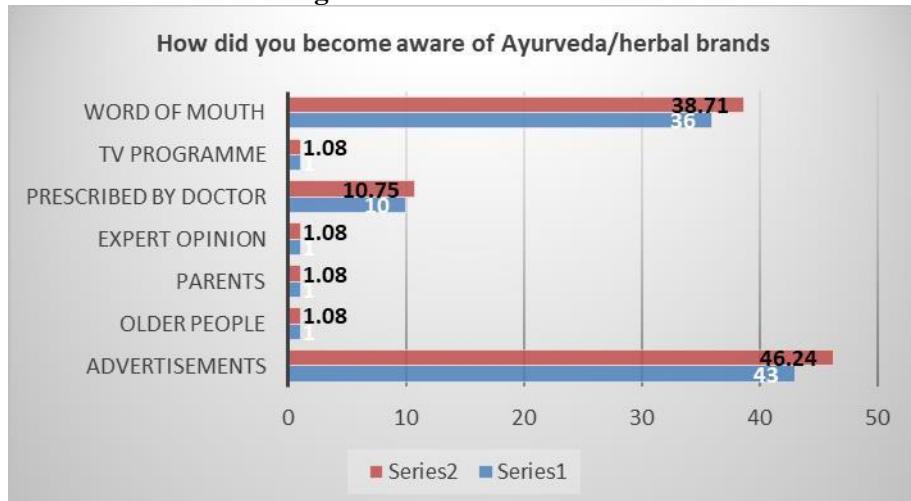
The reason why Majority of the respondents use Ayurveda is they find better results. But many feel the results are not up to expectation. 11% of the respondents use it as it is prescribed by doctor. So Ayurveda has an immense scope to increase market share.

**Fig.5 : Ayurveda/herbal Brand Preference**



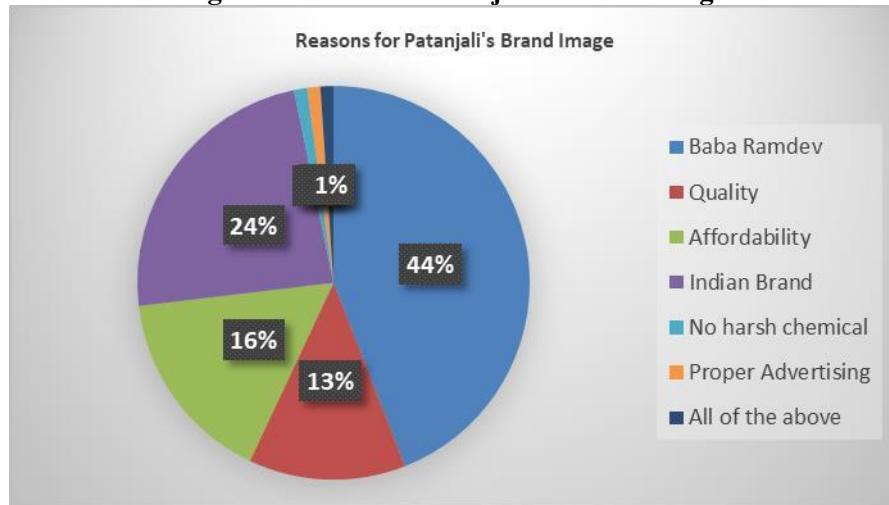
Himalaya is the biggest competition for Patanjali. Dabur is also a heritage brand and trusted brand. But Patanjali is a young brand and the growth is stunning. It is evident that Patanjali can be the market leader and have a bigger market share.

**Fig.6: Sources of Awareness**



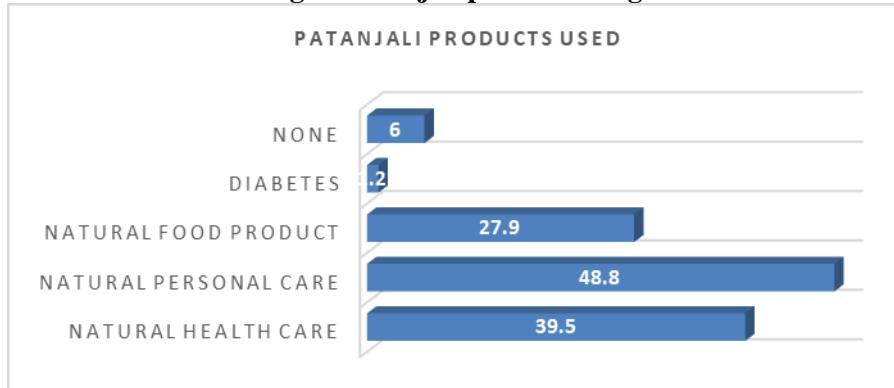
Majority of the respondents have become aware due to advertisements. Word-of-mouth has also influenced the respondents. Doctors also prescribe Ayurveda So the consumers are aware and there is trust for Ayurveda. So potential for growth is immense.

**Fig-7: Reasons for Patanjali's Brand Image**



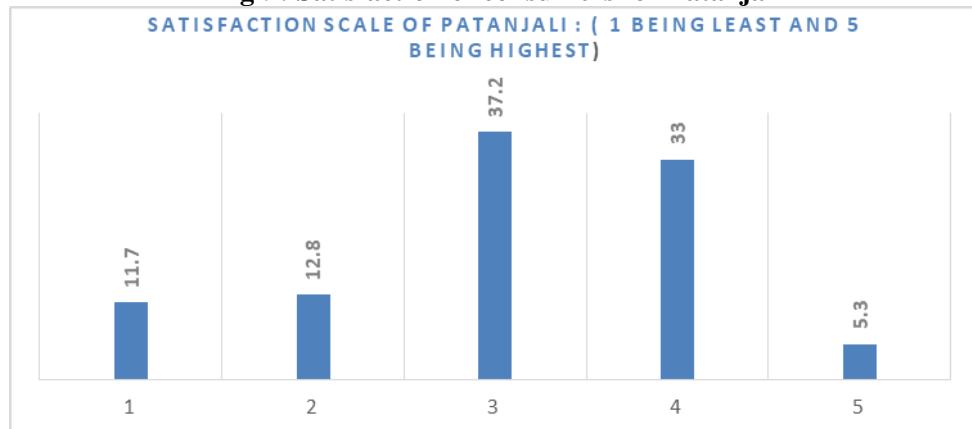
Baba Ramdev has a strong brand association and he is the Brand ambassador as well. 24% of the consumers also like Patanjali as it is an Indian Brand. 16% find it affordable. 13% trust the quality. So all these are healthy signs for a brand's growth in the market.

**Fig-8: Patanjali products usage**



Natural Personal care products of Patanjali are used by majority of respondents followed by Natural Health care. Natural Food Products are also used by majority of the respondents. Patanjali can launch new products.

**Fig-9: Satisfaction of consumers for Patanjali**



Majority that is 37.2% of the respondent's satisfaction is average. 33% of the respondents are very satisfied with Patanjali. Hence Brand loyalty of Patanjali can increase if good marketing promotions are introduced.

- **FINDINGS**
- It is observed that Consumers are aware of Ayurveda/herbal brands,

- Even the young population are aware but they are not using Ayurveda brands regularly.
- Majority of the respondents have seen advertisements and gained awareness and word-of-mouth has also influenced them.
- Himalaya is the leading brand among Ayurveda/herbal brands and biggest competitor of Patanjali.
- The Natural Personal care products are in demand followed by Natural health care and food products.
- Baba Ramdev has a strong brand association.
- Majority of respondents are satisfied with Patanjali.

## SUGGESTIONS

- 1) As the youth are aware of the brand so Patanjali can focus more on Brand promotion to attract the youth.
- 2) Patanjali can invest in Research and Development and create products which can be substitutes for Himalaya and Dabur.
- 3) Baba Ramdev is the face of the brand but celebrities can be used for advertising to create an impact on the youth.
- 4) As majority of the respondents are satisfied with Patanjali so there is a huge scope for Patanjali.

## CONCLUSION

The analysis carried out in this paper show that Ayurvedic/ Herbal brands are capturing the FMCG market at great speed in India. Increasing consumer consciousness and the availability of natural substitutes has created this shift. Patanjali Ayurveda has brought a major change in the FMCG scenario. The fact that the FMCG giants offering synthetic products so far are exploring the natural options shows that they are afraid of losing the market to the ayurvedic/herbal brands. Consumers are conscious of the positive and safe promise of Ayurveda/ herbal brands. So, this trend of growth of ayurvedic/herbal brands seems to be irreversible, if they keep adding research to enhance their brand performance.

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## An Overview of Ayurveda Market in Personal Care Products and its Future Prospects

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### ABSTRACT

*Ayurveda is Ancient Science of life. Traditional medicine of India passed through generation to generation through word of mouth and ancient Vedas which gain popularity at National and International level. Preserving our knowledge and protecting it from biopiracy and unethical practice are the challenges confronting us. Government regulations and policies for regulating the ayurvedic market is inevitable to keep a bench mark of standard at global market. The current research paper tries to find out the preference for ayurvedic personal care products among customers, status ayurvedic market at present and its future prospects.*

**Keywords:** Ayurveda, ancient medicine, government policy, Vedas, personal care products

### INTRODUCTION

Ayurveda is an eternal science flourished in India, dates back to 2<sup>nd</sup> Century BC. Ayurveda is the system of medicine that evolved in India with a rational logical foundation and it has a distinct entity from remote antiquity to present day(V.Narayanaswamy, Ancient Science life, 1981,July-Sep). The teachings of Ayurveda is originally described in the Vedas. The word Ayurveda is derived from AYU and VEDA. AYU means life , VEDA means science or knowledge. Ayurveda means Science of Life. It is not only a system of medicine, it is a way for healthy life with spiritual attainment. Medicinal Plants and natural ingredients are used for the wellbeing of human life , animal life and plant life.

Many FMCG firms focus ad attracts the customers, in India and across the globe, who realised the importance of Ayurvedic Products. Ayurveda market never failed to attract the customers of all ages, including Urban and Rural dwellers. According to industry estimate, India's Global natural products consist of US\$ 4.5B in 2017. By 2026, it is expected to rise three fold to US\$ 14.9B. Nearly 75% of the people in India use some form of traditional medicine.

Looking at the growing demand for Ayurvedic product, Government of India established Ministry of AYUSH which is responsible for policy formulation, development and implementation of program for the growth of Ayurveda.

Growing popularity of Ayurvedic attracted many companies into producing Ayurvedic products. In due course of time. The companies are subjected to criticism like failed quality test, misleading information and exaggerated advertisement etc. Central authorities have received about 600 complaints of exaggerated claims and advertisement since 2015. In order to ensure efficacy proof, basic minimal testing of any ayurvedic drug is missing at present. Ayush ministry set a protocol for National Pharma company Vigilance Programme for ASU Drugs. Ministry of Health and Family Welfare enacted Drugs and Cosmetic Act 1940 to regularise Drugs and Cosmetics. The current paper tries to find out the present condition of ayurvedic market, expectations of people who are the end users of Ayurvedic personal care products and measures which are to be taken by the government to reach out the personal care Ayurvedic products in Indian market and Global Market.

### CONTRIBUTION OF AYURVEDIC PRODUCTS TO GDP

The total contribution of Ayurvedic products to country's GDP shows gaining popularity of Ayurvedic Product in India and Global market.

Constant efforts are to be taken to maintain the share of contribution by Ayurvedic product towards economic growth of India.

### GVA at current prices in Crore of rupees.

Description	2011-12	2012-13	2013-14	2014-15	2015-16
Manufacture of pharmaceutical; medicinal	90544	85609	101262	113354	126695

chemicals and botanical products					
Total manufacturing	1409986	1572830	1713445	1883929	2065093
Share to total manufacturing	6.42	5.44	5.91	6.02	6.14
All India GDP	8106656	9205315	10366266	11470415	12451938
% share of contribution of ayurvedic products to GDP	1.12	0.93	0.98	0.99	1.02

Source of data :[www.pib.gov.in](http://www.pib.gov.in)

## GOVERNMENT POLICIES AND INITIATIVES FOR DEVELOPMENT OF AYURVEDA

The Ministry of AYUSH was formed on 9<sup>th</sup> November, 2014 to ensure the optimal development and propagation of AYUSH system in health care.

AYUSH Ministry has proposed to amend Drugs and Cosmetic Rule , which will give way for Central Technical Authority whose approval is necessary before State Government permit manufacture or sale of Ayurvedic Drugs.

Many Institutes like National Institute of Ayurveda , Rashtriya Ayurved Vidyapeeth and All India Institute of Ayurveda are setup by the Government who are responsible for transforming India's ancient medicine to the brand of Global acceptance.

Government has taken efforts to establish various research centres and information cells to extend support to farmers in educating them in growing medicinal plants and supply seeds, sapling.

The National Medicinal Plant Board (NMPB) has been established to frame policies and strategies for the conservation, harvesting and cost effective medicinal plants.

Farmers engaged in cultivation of Medicinal Plants are encouraged by government through Financial assistance like 75% subsidy for growing plants included in Schedule VI of Wildlife Protection Act.50% subsidy to the medicinal plants which has long gestation period and 20% subsidy for cultivation of other medicinal plants.

Traditional Knowledge Digital Library has been set up by Ministry of Ayush to protect ancient knowledge of India in AUS from unethical patents. Traditional medicinal knowledge found in different ancient scriptures of Sanskrit, Malayalam, Kannada, Tamil, Urdu, Persian and Arabic is digitalised and translated into different international languages namely Japanese, English, French, Spanish and German

Herbs and aromatic plants used in Ayurvedic medicine and health care products increased the earnings of farmers. Rapid increase of demand of such product led to earnings of Rs.3 lakhs per acre against the earnings of Rs.30,000 per acre on paddy farming.

## OBJECTIVES

1. To find out opinion of customers about Ayurvedic Personal Care Products
2. To analyse the current Indian market for Ayurvedic Personal Care Products
3. To suggest the measures and policies for regularising and branding Ayurvedic Indian Market.

## RESEARCH METHODOLOGY

The researcher collected data from 65 end users of Ayurvedic personal care products. Convenience sampling method is followed to select the sample. Questionnaire method is adopted to collect the data.

Secondary data is collected through various government websites and report of Drugs and Cosmetic Act, 1940

The descriptive data is analysed through table, percentage, charts and diagrams. Statistical software SPSS has been used for statistical analysis. To draw relation between variables namely preference for ayurvedic products and attributes of ayurvedic products, correlation technique is used.

## HYPOTHESIS

H0: There is no significant relation between preference for personal care products and product attributes.

## ANALYSIS AND INTERPRETATION

Indian customers are looking for modern products with traditional touch into it. Indian market is flooded with many personal products ranging from skin care, dental care and hair care products. As people believe that

Indian traditional medicines are free from side effects, they would prefer to look for the products with natural ingredients. We can list out many attributes which are expected by Indian customers from Ayurvedic products.

**Table 1:**

Tables shows the Correlation between Preference for Ayurvedic Product and Ayurvedic Product attributes expected by the customers.

Independent Variable	Dependent Variable	Chi Square Test	Spearman Correlation
Preference for Ayurvedic Product	Free from Adulteration	0.263	0.656
	Fulfils buying Intention	0.488	0.615
	Reliable	0.557	0.43
	Natural Variants	0.715	0.658
	Gentler and Safer	0.714	0.916
	Suitable for all ages	0.866	0.655
	Safety and efficacy	0.233	0.628
	Disclosure of ingredients	0.369	0.312

### Interpretation from correlation

For finding the relationship between the variables namely Preference for Ayurvedic Product and Ayurvedic Product attributes expected by the customers, two tailed significance test of correlation is applied by the researcher.

The above analysis reveals that there is high degree of significant relation between Preference for ayurvedic product and the product attribute gentler and safer as P, the population correlation coefficient is 0.916.

It is proved that moderate relation exists between preference for the product and the other product attributes namely free from adulteration, fulfils buying intension, natural variants, suitable for all ages, safety.

The relation between the variables preference for the product and disclosure of ingredients has been proved to be least.

Hence the P value falls between 0 to 1 , it is proved that product attributes has positive correlation with preference for ayurvedic products.

### Interpretation from Chi Square

The result of Chi-Square test reveal that there is significant relation between two categorical variables namely preference of Ayurvedic products and Product attributes at 5% significance level. Null hypothesis is rejected and it is proved that there is a significant relation between preference for the product and product attributes as  $P > 0.05$

**Table-2**

Categories	Factors	Frequency	Percent
Preferred field of Ayurvedic Product	Health Care Products	27	42%
	Personal Care Products	25	39%
	Medicine	25	39%
Preference for Personal Care Products	Hair Care Products	20	31%
	Skin Care Products	23	35%
	Dental Care Products	16	25%
	Cosmetics	16	25%
	Home Care Products	14	22%
Awareness on presence of Heavy metals in Ayurvedic Products	Strongly Agree	6	9.2%
	Agree	10	15.4%
	Neutral	36	56.9%
	Disagree	10	16.9%

	Strongly Disagree	3	1.6%
Opinion on Ayurvedic Products			
Quality	Strongly Agree	20	30.6%
	Agree	27	41.53%
	Neutral	17	26.15%
	Disagree	0	--
	Strongly Disagree	1	1.72%
No side effects	Strongly Agree	19	29%
	Agree	20	30%
	Neutral	18	28%
	Disagree	6	9%
	Strongly Disagree	2	4%
Not to be referred by Doctors	Strongly Agree	13	20%
	Agree	16	25%
	Neutral	17	26%
	Disagree	14	22%
	Strongly Disagree	5	7%
Alternative to Allopathic Medicine	Strongly Agree	4	6%
	Agree	20	30%
	Neutral	27	42%
	Disagree	11	17%
	Strongly Disagree	3	5%
Supplement to Allopathic Medicine	Strongly Agree	5	7%
	Agree	23	35%
	Neutral	28	43%
	Disagree	7	11%
	Strongly Disagree	2	3%
Trusted as it is an Ancient Medicine	Strongly Agree	24	37%
	Agree	21	32%
	Neutral	17	26%
	Disagree	2	3%
	Strongly Disagree	1	2%
Quick Result	Strongly Agree	2	3%
	Agree	12	18%
	Neutral	22	34%
	Disagree	22	34%
	Strongly Disagree	7	11%
Permanent Result	Strongly Agree	6	9%
	Agree	26	40%
	Neutral	23	35%
	Disagree	6	9%
	Strongly Disagree	4	7%
Trend	Strongly Agree	11	17%
	Agree	27	41%
	Neutral	19	29%
	Disagree	1	2%
	Strongly Disagree	7	11%
Products fulfil buying intention	Strongly Agree	5	8%
	Agree	31	48%
	Neutral	28	43%
	Disagree	1	2%
Reliable	Strongly Agree	13	20%

	Agree	33	51%
	Neutral	17	26%
	Disagree	2	3%
Awareness about Ayush Mark	Strongly Disagree		35.4%
	No		30.8%
	Maybe		33.8%
Presence of Natural Ingredients in Ayurvedic Products	Yes		53.8%
	No		4.7%
	Maybe		41.5%
Presence of Heavy metals in Ayurvedic Products	Yes		7.7%
	No		21.5%
	Maybe		70.8%
	Maybe		32.3%
Measures by Govt. to popularise			
Mandatory Ayush Mark	Strongly Agree	30	46%
	Agree	20	31%
	Neutral	11	17%
	Disagree	3	5%
	Strongly Disagree	1	1%
Subsidy	Strongly Agree	16	25%
	Agree	29	45%
	Neutral	17	26%
	Disagree	2	3%
	Strongly Disagree	1	1%
Reduce GST	Strongly Agree	15	23%
	Agree	24	37%
	Neutral	20	31%
	Disagree	5	9%
	Strongly Disagree	1	1%
Standard Operating Procedure	Strongly Agree	18	28%
	Agree	27	42%
	Neutral	17	26%
	Disagree	2	3%
	Strongly Disagree	1	1%
Patent for Ayurvedic Products	Strongly Agree	22	34%
	Agree	28	43%
	Neutral	12	20%
	Disagree	2	3%
	Strongly Disagree	1	1%
Regularisation of the market	Strongly Agree	24	37%
	Agree	23	35%
	Neutral	16	26%
	Disagree	1	1%
	Strongly Disagree	1	1%
Clinical Research	Strongly Agree	26	40%
	Agree	26	40%
	Neutral	10	17%
	Disagree	2	3%

## FINDINGS

The following are the findings made based upon the interpretation

1. Among Ayurvedic products, health care products are preferred by 42%. Like preference for health care products, personal care products and medicine are the ayurvedic products category equally preferred by the respondents.
2. Among personal care products, 39% of the respondents like to buy hair care products.
3. Awareness about presence of heavy metals in Ayurvedic product is less and 24% of the respondents agree to it.
4. About 70% of the respondents gave opinion that quality, reliability of the product and Trust worthy as it is an ancient Indian medicine are the key deciding factors in buying ayurvedic products.
5. 40% of the respondents agree that Ayurvedic can not be supplement or alternative to Allopathic medicine.
6. Nearly 45% agreed that Ayurvedic product fail to give permanent and quick result.
7. 59% responded that usage of Ayurvedic product will not lead to any side effects.
8. Majority of the respondents do not aware of AYUSH mark which symbolise standard of ayurvedic products.
9. 54% of the respondents agreed that ayurvedic products contain natural ingredients.
10. Respondents were insisted that AYUSH mark should be mandatory. 77% of the respondents favoured for AYUSH mark
11. To encourage ayurvedic product , 70 of the respondents revealed that subsidy may be granted to ayurvedic companies.
12. Reduction of GST and standardised operating procedure are suggested by 70% of the respondents.
13. 77% of the respondents answered that Patenting of Ayurvedic product is required.
14. Regularisation of Ayurvedic market is agreed by 61% of the respondents.
15. Clinical research should be encouraged in the field of ayurvedic product is agreed by 80% of the respondents.

## RECOMMENDATION

Ayurvedic market in India is not regularised. The steps which are taken by the Government to ensure efficacy of the product should be stringent and mandatory for the companies in India to adhere the rules and regulations.

1. One of such regularisation steps would be making AYUSH mark mandatory for all ayurvedic products. At present AYUSH mark is a voluntary certification for Ayurveda Siddha Unani Products. As per the data of Ministry of AYUSH, 146 of ASU have been awarded AYUSH Premium mark and 97 products are awarded AYUSH Standard Mark. Only Eight companies sought for AYUSH Premium Mark. This aspect must be given due consideration as in India , there are 9228 Micro and Small units are present and numerous large scale companies are exploring demand for ayurvedic products.
2. In India and Western Countries Ayurvedic products are looked as a medicine without side effects. But consuming such medicine without proper guidance from the expert will lead to unwanted result. It is necessary to highlight the scientific approach of Ayurveda towards illness with proven data will spread the market across the globe.
3. In an environment of increasing acceptance for ayurvedic product in Western Countries, majority of micro and small manufacturing units which are engaged in producing ayurvedic product are to be supported by Government in the form of subsidy, awareness program on the need of focusing quality at an international level.
4. As the current research revealed that majority of the respondents did not know about presence of heavy metal in ayurvedic products, awareness is to be created among them about permissible limit of such metals which do not harm.

5. It is compulsory for the companies to mention the ingredients of the product and permissible limit of usage of heavy metals and natural ingredients.
6. Though Government has reduced GST on Non branded ayurvedic products to 5%, branded ayurvedic products are subjected to 12% GST rate. For the purpose of regularising the market and sustaining quality of the product, it is necessary to encourage companies of high reputation who can cater the needs of the Society.
7. The research conducted to validate the quality of the product proved that ayurvedic products contain lead, mercury and arsenic at levels which could be harmful. Hence it is necessary to focus more on clinical research in Ayurveda.

## CONCLUSION

The study reveals that the respondents prefer to use personal care products. Brand trust and recommending the product to others reveal promising market for ayurvedic products in India. Ayurvedic products contributes its chunk of share in GDP. Growth of medical tourism and growing awareness about Ayurveda in international market lead to boom in ayurvedic product sector. India is second largest exporter of spices and medicinal plants. Shifting from export of valuable raw medicinal plants to manufacturing of finished health care products out of such material could be possible through strengthening of Research and Development. India has to face the global challenges for ayurvedic products while conserving its traditional heritage through proper Government policies to validate the efficiency of Ayurvedic products.

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## Online Pharma Retail: Need for Regulations – A case study

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### ABSTRACT

*To purchase the prescribed drugs through online retail is an opportunity or not for the end consumers in an Indian context. This paper presents the issues and challenges related to online pharma retail in the India through case method. India is among the largest pharmaceutical producers in the world. Buoyed by the amazing success achieved by consumer durables industry in the online space, Indian pharma Industry is the next big sector in India to target consumer online. The growth in the industry has created a great opportunity for the online model for this business. Though online medicines look like a promising trend today, the business is challenged by regulatory issues and trust factor.*

**Keywords:** Online pharmacy, Online pharma retail, Online medicines, E-pharma retailing.

### INTRODUCTION

The Indian pharmaceutical market is pegged at INR 79,000 crore, growing at around 20% p.a. India is among the top six global pharmaceutical producers in the world.

Retail Pharma in India is widely fragmented throughout the country. A small percentage of organised shops tend to operate under a unified retail banner with a large number of shops. The small shops managed to literally stumble their way in the market and predictions are that they will continue to corner a substantial market share. This Industry both Nationally and Internationally is highly regulated. However, on a local level, the market is yet to become more organized. Buoyed by the amazing success achieved by consumer durables industry in the online space, pharma is the next big sector in India to target consumer online. The growth in the industry has created a great opportunity for the online model for this business. India has now seen pharma players taking the e-commerce route with an intention to offer a solution to a number of problems plaguing the retail pharmacy industry. Though online medicines look like a promising trend today, the business is challenged by regulatory issues.

According to FICCI's spokesperson, "Presently, online pharmacy is at its nascent stage in India, but like other categories, it has the potential to be a very large industry segment. It is expected that the online pharmacy model could account for 5-15% of the total pharma sales in India, largely by enhancing adherence and access to the medicines for a lot of the under-served population." Hemant Bhardwaj, Chief Executive Officer, Co-Founder and MD, PM Health and Life Care draws attention to the benefits of the model and says, "The icing on the cake is the concept of "Marketplace," which is fuelling big dreams among thousands of small retailers. Now, their business is no more constrained by the carpet area of their shops. Moreover, for a minute, if ignore the massive discounts offered by E-retailers, this channel still has a lot to offer to the customers in terms of convenience. Currently, 35 million Indians prefer buying products and services online.

### CHALLENGES IN ONLINE RETAIL

There are many players who have already stepped into the business or are intending to offer medicines online. However, several challenges are associated with the e-commerce platform.

At present, the D&C Act does not allow sale of Schedule H medicines without a doctor's prescription. In fact, even OTC pharma products can be sold only by licensed retailers. The D&C Act 1940, and the D&C Rules 1945 has guidelines on the sale of Schedule H and Schedule X drugs. These can be sold only on prescription, and there are specific rules, including for labeling and bar coding. There are multiple laws in India that govern dealing with food, health, cosmetics, drugs, medicines, and nutraceuticals in India. Online sale and purchase of prescribed drugs and medicines in India are collectively governed by these and other laws. Many online pharmacies in India are inviting legal risks by not following the applicable laws in this regard. These laws are also too old to deal with the advancements in technology and are currently a gray area.

## REVIEW OF LITERATURE

“A prescription issued by a doctor cannot be re-used randomly. There is a danger that scheduled drugs can be re-ordered and misused by the consumer,” **Jayesh Lele**, president, IMA, said. “Besides, there are several ‘do’s and don’ts’ with regard to storage and dispensing of prescription medications that need to be adhered to,” he added. According to **Lele**, “self-medication is a rampant practice in India, and online sale of drugs would only encourage it. Indiscriminate use leads to patient resistance which is very dangerous as has been the case with tuberculosis drugs.” **KK Aggarwal**, the secretary general of IMA, highlighted another challenge. He said that data generated from the online business could be misused. Websites may use data to sell luxury items to people who visit online stores for costly medicines. They may even sell the data to hospitals and doctors. While the Supreme Court has ruled that doctors cannot give consultancy on the phone, except during emergencies, the attempts to use technology to render medical services has also not taken off. As far as India is concerned, we have no dedicated e-health and telemedicine laws in India. However, a basic level legal e-commerce framework has been provided by the **Information Technology Act, 2000** (IT Act 2000) that is the cyber law of India. When technology is used for medical purposes, it gives rise to medico legal and techno legal issues. Individuals and companies selling pharmaceutical products through the website are also required to comply with various laws. These include laws related to medicines and pharmacy profession and cyber law of India. Surprisingly, most of the online pharmacies stores and websites in India are not aware of the cyber law due diligence requirements and Internet intermediary liabilities. As a result, they are violating the provisions of **IT Act, 2000**. **Aggarwal** expressed his concern and said, “Online pharmacies will promote drug abuse, drug misuse, self-medication, etc. Any medication taken without the supervision of doctors may be dangerous and even potentially life-threatening. There is every chance that the prescriptions submitted via fax/email may be fake, and it could be difficult to verify their authenticity.” **Aggarwal** also indicated, “Online pharmacies may provide rebates and commissions to doctors to provide prescriptions on the basis of online information that has been filled by the patient. This way doctors will be vulnerable to malpractice suits and MCI code of ethics (Regulation 6.4) prohibited giving or receiving any rebates or commissions by doctors ”

## RESEARCH METHODOLOGY

The researcher in association with a leading offline Pharma retail chain has conducted a case research by placing 2000 orders across major online pharma stores. The study was conducted with some specific objectives in mind, which were analysed to conclude about the efficiency of Online Pharma stores

## OBJECTIVES

- To find out whether online Pharma stores fulfil complete order or they follow deliver what is available
- To analyse whether online Pharma store deliver the Brand which is ordered or they deliver alternate generic medicine’s
- To observe as to whether online Pharma store adhere to the prescriptions in terms of validity.

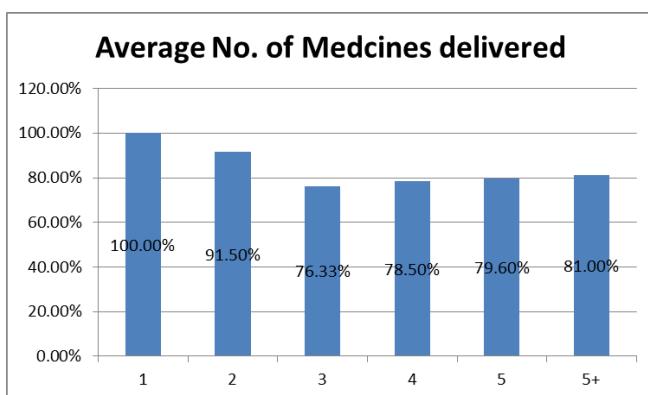
## DATA ANALYSIS AND FINDINGS

The findings of the research are to the least be called shocking and indicates the need for proper regulations in the sector



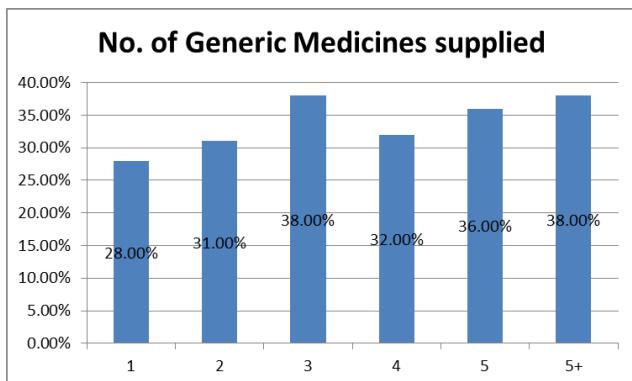
This chart shows number of medicines order per order. The analysis clearly indicates that the most orders for online pharma are majorly 4+ medicines per order. This indicates that majority of the customers upload the entire prescription and depend completely on online pharma for there medicines

Chart 1.1 Number of Medicines order per Order



As it is evident from the adjoining figure not all medicines ordered are delivered. This is a major concern area as most of the people who upload the entire prescription are not even aware as to how many medicines are mentioned in the prescription

Chart 1.2 Number of Medicines delivered per Order



One of the most contagious issue is that Generic drugs are been offered without the patient consent and no proper prescription. This is of great concern as this is effecting the overall time taken for treatment and complete recovery

Chart 1.3 Generic drugs supplied against prescription

From the above analysis it is clear that Online pharma retail are not as good as it appears as they do not fulfil entire order that too with most of the patients/ customers not aware of the same, and the medicine which they deliver, many are not as per the prescriptions but are generic versions of the prescribed drugs more over prescription is only used as a formality as most of the orders placed using outdated prescription were delivered.

## CONCLUSION

It is evident what is desired is not delivered and this leads to lot of discomfort resulting in extended medication and increase cost. With even outdated prescription honoured this entire online pharma retail is slowly becoming a cause of concern. With no specific rule and regulating authority in place for online Pharma retail the same is running into untested waters and getting an unfair advantage over their off line peers. A nodal agency has been appointed by the DCGI for consolidating the guidelines and was to get views from industry bodies such as OPPI, All India Chemists and Druggists Association, States Chemists and Druggists Associations, Indian Medical Association. The Indian pharmaceuticals industry needs a new regulatory framework to effectively bring e-pharmacy under its ambit. The Drugs and Cosmetics Act does not have any guidelines for e-commerce players in the pharmaceuticals sector. The government has taken a correct stance as to ensure that only licensed pharmacies sell prescriptions drugs.

## SUGGESTIONS

The role, responsibilities, and liabilities of e-commerce marketplace and the product sellers need to be clearly defined. It becomes, even more, critical to have a framework in place when the intermediary is selling drugs where the safety and health of the consumer are of paramount importance. Government of India must at the earliest come out with concrete guidelines for Online Pharma stores to ensure that the interest of the customers are protected across all levels.

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## Preventive and Social Medicine W.S.R.T. Ayurveda and Yoga

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### ABSTRACT

*The aim of health care sector is absence of disease. Preventive and social medicine plays an important role in it. It can be managed at 3 levels namely public, private and individual. The government and its agencies managing health care system do their job by immunization, public awareness and public schemes.*

*In India, the present challenge of preventive medicine is to motivate individuals to practice their own prevention. In order to encourage health and fitness consciousness in people, the government of India launched 'Fit India' a nation-wide movement to promote physical activities and sports in our daily lives. It was launched by Prime Minister Shree Narendra Modi on 29 August 2019.*

*Along with daily physical activity, daily routine is important. A perfect daily routine is key to prevention of disease at an individual level. Basic principles of Ayurveda and Yoga can play a vital role in it.*

**Keywords:** WHO, Daily Regimen, Hathayoga, OM, Pranayama, Spiritual

### 1. INTRODUCTION

In English they say 'prevention is better than cure'. It is very important statement in health care. It means prevention of disease and promotion of health. WHO has defined the term health as "Health is state of complete physical, mental and social well-being and not merely absence of disease or infirmity"<sup>[1]</sup> If we are to achieve this state of health we not only have to be disease free but also maintain physical, mental and social well-being.

Preventive medicine plays an important role in the achievement of this state of health. According to modern science preventive medicine can be defined as "Art and science of health promotion, disease prevention, disability limitation and rehabilitation." Preventive medicine includes specific medical measures as well as general health promotion. There are 3 types of prevention primary, secondary and tertiary.

1. Primary- Prevention of disease amongst healthy people.
2. Secondary- Management of disease
3. Tertiary- To reduce prevalence of chronic disability consequent to disease.

There are 3 levels of prevention Public, Private and Individual<sup>[1]</sup>.

Modern preventive medicine implies more personal encounter between individual and health professional than public health. It is a kind of anticipatory medicine.<sup>[1]</sup>

Cornerstone of preventive medicine is however, "Primary Prevention" that is maintenance of health of healthy individual.<sup>[1]</sup>

Modern preventive medicine, therefore, is not confined to doing things for people by ensuring them safe food and water, or doing things to them by immunizing them against infectious diseases. These are the functions of government, its agencies and primary care physician. In the final analysis, preventive medicine requires actions taken by people for themselves<sup>[2]</sup>.

Individual health depends on what, when, where, how we eat, we live, we interact with people, we take care of our body, we sleep, we go to work etc. i.e. our daily routine. How we should carry out our daily routine is better explained by our ancient medical science Ayurveda in daily regimen chapter. And Yoga our spiritual science explains way of life.

In this paper, we have reviewed the merits of Ayurveda and Yoga as preventive medicine in terms of physical, mental and social well-being on individual level.

## DISCUSSION

Ayurveda is a science of life. Definition of Ayurveda implies the science of knowledge of life. Its origin can be traced far back to the Vedic times. The primary objective of Ayurveda is to maintain health of healthy individual and then secondary objective is to treat the diseased.<sup>[3]</sup> Concept of preventive medicine was introduced by Ayurveda far back in the ages. Spiritual well-being is not included in WHO's definition of health but was included in its definition in Sushrut Samhita.<sup>[4]</sup> Both definitions probably mean the same but the one from Ayurveda is more inclusive of facts and explained much earlier.

It implies equilibrium of tridoshas vata, pitta and kapha, balanced function of all kind of transformations in the body, optimum function of all excretions, balanced state of mind, sense and soul. We are scientifically stating principles of Ayurveda and yoga which accomplish physical, mental and social well-being.<sup>[4]</sup>

### 1. Physical well-being:

- It is recommended that one should get up at Brahma Muhurta for well-being. Brahma muhurta is last 3 hours of night which is 3 AM to 6 AM. It is the best time in which all excretions have a natural tendency to come out of the body. Body becomes pure. It is the best time to study and obtain brahma or knowledge. One of the requirements of physical well-being is to eliminate bodily waste early in the morning.<sup>[5][6]</sup>
- Ayurveda has explained 13 types of natural urges that should not be suppressed. These are flatus, feces, urine, sneeze, thirst, hunger, sleep, cough, breathing on exertion, yawn, cry, vomiting and semen. Suppression of these urges is the cause of many diseases. They produce many symptoms. One symptom in suppression of feces can be oppression in region of heart. As we all see, there are many cases related to cardiac arrest and myocardial infarction occurring in toilets.<sup>[5][6]</sup>
- Physical exercise is necessary to maintain good health. It brings lightness to body, ability to do hard work, improves digestion, depletion of excess fats, subtle and distinct physique. It also maintains equilibrium of tridoshas.

People who are strong and indulge in fatty foods, in cold season and spring should do exercise to half of their strength only. While others and in other seasons should do it mildly. Here important thing is season wise exercise and also quality and strength wise exercise. After exercise all parts of body should be massaged comfortably.<sup>[5][6]</sup>

- Abhyanga (oil massage) should be resorted daily. It wards off old age, exertion and aggravation of vata dosha. It gives good vision, nourishment to body, long life, good sleep, good and healthy skin. It should be done especially to hands, ears and feet.<sup>[5][6]</sup>
- Massaging the body with soft powders of medicinal plants that is Udvartana mitigates kapha, medodosh, generates stability, strength to body parts and maintains quality of skin.<sup>[5][6]</sup>
- From womb to tomb our nourishment depends on our food. Food we eat reflects in our health. Diet is most important for well-being.

A person should eat food after complete digestion of previous meal, which is suitable for him and in limited quantity. Quantity of food should depend on appetite. It should not harm any physiological actions in the body. Every food substance whether it is easy or hard to digest should be taken in a proper quantity. If we eat foods which are easy to digest but in large quantity it may also harm your health.<sup>[3]</sup>

Ayurveda also stated importance of exercise in digestion of food. People who carry out hard physical work every day, can eat foods which are hard to digest as well as in large quantity.<sup>[3]</sup>

Nowadays people who live sedentary life eat foods like pizzas, burger, meat, heavy milk products like curd, paneer, cheese etc. which is hard to digest. If this habit of eating continues for long time may produce many disorders.

- One should cut his hair, nails and mustaches. Keep hands and feet clean. Bathe daily. Wear scents and good dress.<sup>[6]</sup>

## 2. Metal well-being

Yoga is science and system of purification of mind. It is an effective technique of spiritual elevation. Spiritual elevation is possible only when mind is silent. Patanjali muni has described various ways of controlling the mind. <sup>[8]</sup>

Hathayoga uses body as instrument for achieving the higher goal. Therefore, making this instrument fit, strong and powerful is basic practice of hathayoga. It aims at making body supple, cleanse it of impurities at physical and mental levels. Yoga is the medium is to improve physical ability, mental stability, emotional peacefulness and spiritual blissfulness. There are many researches on yoga. In present time it has become a popular subject of research. <sup>[8]</sup>

- One research says that OM chanting produces Alfa and Theta waves in brain which indicates highest state of peacefulness.
- OM chanting and Gayatrimantra reduces blood pressure and heart rate. It is also effective in mitigation sleeping disorders.
- Scientific study on group of asanas showed increase in BMR, breath holding time, hemoglobin, RBCs, increase in chest expansion while decrease in heart rate and respiratory rate.
- Decrease in energy expenditure was observed after the practice of selected asanas for 10 weeks.
- Significant improvement was seen in flexibility after the training in yogasana.
- Pranayama improves quality of sense organs.
- Pranayama- Suryabhedana, chandrabhedana, nadishuddhi improves memory by 84%

If we succeed in taking control of breath (prana) we can control our mind. <sup>[9]</sup>

## 3. Social well-being

All human activities are aimed at for the happiness of all living beings. Such happiness is based on right moral conduct. So every person should adopt right moral conduct. By saying this, Ayurveda also explained social angle of health. <sup>[6]</sup>

- Every person should avoid ten sins. Causing injury, stealing, unlawful sexual activity, abusive language, speaking untrue, speech causing separation, intention of harming, jealousy, finding faults of others. Out of these 10 the first 3 pertain to body, next 4 to speech and last 3 are to the mind. Yoga also mentioned Yama and Niyama for moral conduct.
- Even insects and ants should be treated with passion and kindness.
- Sense organs should not be strained or fondled.
- One should not sneeze, laugh or yawn without covering his mouth. One should not engage in selling, brewing, distributing and receiving liquor. <sup>[6]</sup>

Social medicine is concerned with knowledge embedded in epidemiology and medical care of society. Man is a social animal. Disease has a social cause, social consequences and social therapy. <sup>[1]</sup>

Epidemics have also happened in vedic times. They are also explained in Ayurveda. Charakacharya named them as Janopadadvansa. It means death of many living things at a time. Main reason of epidemics as per charakacharya are Vata(air), Jala(water), Desh(specific region), Kala(time or season). <sup>[3]</sup>

Preventive and social medicine is not a new concept. It was basic the method of disease prevention in Ayurveda. There have been many epidemics in the past. Their management was done by principles of Ayurveda and yoga. These were only two sciences present at that time in India. They were capable of managing such epidemics.

Presently Ayurveda is established medical science which has its own limitations and merits. All lifestyle disorders have an answer in Ayurveda and yoga. Because these are the sciences which explain better how to live a healthy life. They have preventive measures based on their own principles.

Thus, we can say that three major facts of health viz. physical, mental and social are thoroughly addressed through Ayurveda and Yoga.

They also address Spiritual aspect of health which makes them unique from other PSM sciences.

Scope for Further Studies:

There is a vast scope for detailed research, mostly revalidation of this ancient wisdom through the lens of present analytical techniques, which will benefit large section of the society.

## CONCLUSION

- Both Ayurveda and yoga emphasize customized approach which adds to their comprehensive beneficial value.
- Unique concept of Dinacharya (Daily regimen) and Rutucharya (seasonal regimen) from Ayurveda and Yama, Niyama, Asana and Pranayama from yoga in symbiosis deliver better results.
- Most principles of Ayurveda and Yoga go hand in hand which makes them conducive to each other.
- Thus, modern day preventive and social medicine shall be enormously benefited with inclusion of principles and modules of Ayurveda and Yoga.

## FAMOUS QUOTES

- “Life is combination of body, sense, mind and reincarnating soul. Ayurveda is most sacred science of life, beneficial to humans both in this world and the world beyond.” -----Charakacharya
- “Yoga is our heritage of yesterday, need of today and culture of tomorrow.”

----Paramhamsa Swami Satyananda Saraswati.

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## Effective Implementation of Tele-Medicine by Health Entrepreneurs in Rural India

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### ABSTRACT

*The dire need to provide greater quality healthcare to everyone with a decreasing costs has reached an emergency level. India having a huge population with insufficient personnel working in healthcare sector. The present research discusses the present scenario of health care sector and analyses the implementation of telemedicine in rural areas with the help of Health Entrepreneurs. The objective of the study is to estimate the benefits of telemedicine and identify barriers in implementation of telemedicine. The study has used a survey method to gather data through questionnaire. It has also analysed the role of entrepreneur in the field of telemedicine. It concludes the system of telemedicine can be utilized effectively for better delivery of health care system in rural areas with the help of entrepreneurs*

### INTRODUCTION

Healthcare industry in India covers hospitals, medical devices, clinical trials, telemedicine, medical tourism, health insurance and medical equipment which is growing at a remarkable pace due to its strengthening coverage, services and increasing expenditure by public as well private players. Government has taken different initiatives in terms of Pradhan Mantri Jan Arogya Yojana (PMJAY), to provide health insurance worth Rs 500,000, Ayushman Bharat-National Health Protection Mission, Mission Indradhanush with the aim of improving coverage of immunisation in the country, etc. Still India is at 145th position among 195 countries on the healthcare index according to Global Burden of Disease Study. The reasons for this could be a weak primary healthcare sector. The doctor-patient ratio in India is 1: 1,674. This means that only one doctor is available per 1,674 people in India against the World Health Organization's norm of one doctor per thousand. The other reasons are unequally distributed skilled human resources, low public spending on health, fragmented health information system, spiralling cost of drugs and weak governance and accountability.

While many would find these facts alarming, an entrepreneur would approach this gap between healthcare infrastructure and requirement as an opportunity to make impact, both social and economic. The Indian government continues to invest in healthcare, but it needs support from the private sector. It is vital to bridge the widening gap between the needs of the patients and the offerings of traditional models of healthcare services in the country. This lacuna is also an opportunity to promote the health start-up culture in the country. If promoted well, entrepreneurial enthusiasm can bring the latest technologies, to overcome the hindrances identified.

Entrepreneurship is the key to unlock the potential in Indian healthcare sector ensuring its social benefit that reaches remotely. A health entrepreneur applies his domain expertise which differentiates the business from a system-driven model and approaches the sector as a need-based market. They might not be well-equipped with financial know-how but the requisite knowledge on business finance can be acquired or it may give rise to another chain of entrepreneurs who conjointly work in the same sector. Many studies have identified that Indian rural areas are out of the reach of health care services. This research proposes implementation of Telemedicine in rural areas and facilitate by health entrepreneurs. Telemedicine allows healthcare professionals to evaluate, diagnose and treat patients in remote locations using telecommunications technology. If an individual wish to seek care from local health care professional with a guidance of specialist from a specialty hospital so that they can seek care in their town without having to travel multiple times. In Telemedicine model of healthcare delivery, a patient located in a remote location, connects with the provider through a chat or audio or video consultation, can upload the medical records, and after reviewing, the doctor provides medical advice. The present study tries to assess the importance of implementation of telemedicine system in remote or rural areas by social health entrepreneurs.

## OBJECTIVES OF THE STUDY

- i) To estimate the benefits of telemedicine in health care system in rural areas.
- ii) To identify the barriers in effective implementation of telemedicine in rural.
- iii) To assess the role of Health entrepreneur in implementing the system of telemedicine

## REVIEW OF LITERATURE

Lee et al. (2015) emphasizes the role of social interventions in implementation of telemedicine. According to OECD 2012 outlook report US implemented telemedicine in terms of remote consultation and individual psychotherapy, with Medicare and Medicaid, and insurance benefits provided to elderly people. 21 percent of Canadian population is using telemedicine for psychotherapy and oncology. In Japan, medical treatments and surgeries are performed under teleradiology and telepathology with the advice of doctors (medical facilities) and medical specialists. telemedicine has a distinct and well-established history, especially with regard to the rich scholarly coverage it has received from famous authorities in the research and healthcare fields (Turner 2003), ready access to telemedicine for instance, using videoconferencing between advanced hospitals with specialists can save time, money, and lives (Allen and Hayes, 1994; Allen et al 1996).

Chang (2004), one authority in the e-health field, has also identified that e-health can fulfill the needs of all citizens, healthcare consumers, medical doctors and healthcare professionals, policy makers, and so on. Even with the increasing use of the Internet, and the online surfing and searching for health-related information (Rice & Katz, 2001), e-health services have significant implications from both patients' and doctors' perspectives.

The hindrances in implementing telemedicine are also discussed by many studies. Patients privacy comes under threat as the reports pass through multiple hands and across digital spaces (Whitten et al, 2006). Internet facilities in the rural areas are major concern discussed by Thomas , 2004. Limited knowledge and expertise in telemedicine services (Matusitz & Breen, 2007)

## METHODOLOGY

The study is an e-survey using a validated questionnaire asked to doctors, health care professionals and academicians. A validated close ended questionnaire to access the acceptance of telemedicine, its benefits, barriers to telemedicine and assess the role of health entrepreneurs in the field of telemedicine is designed. The study has performed Mann-Whitney test and Kruskal-Wallis test to see the scoring tendencies of the respondents. Responses are recorded in Likert scale and is represented as percentage.

Mann- Whitney Test  $H_0$ : Males and Females have the same scoring tendency at the 5% level

Kruskal- Wallis Test  $H_0$ :Doctors and Health Entrepreneurs have the same scoring tendency at the 5% level.

## RESULT ANALYSIS

To check the significant association between gender and profession with the acceptance of telemedicine the study conducted Mann-Whitney test and Kruskal-Wallis test. From the Mann-Whitney test we get a p-value of 0.07353, hence we can accept the null hypothesis That Males and Females have the same scoring tendency at the 5% level.

Kruskal-Wallis chi squared test = 7. 5015 DF=4 P= 0.1116

The Kruskal-Wallis test gives us a p-value of 0.116, hence we have no evidence to reject our null hypothesis. We are likely therefore to believe that there is no difference in scoring tendency between people with different profession.

The discussion on result is based on the three objectives. The first objective is to check the acceptance level and benefits of telemedicine in rural areas. The acceptance level is shown in Table 1 and benefits are recorded in Table 2. The responses of the health care professionals are measured in 5 point Likert scale depicted as Strongly Agree (SA), Agree (A), No Opinion (NO), Disagree (D) and Strongly Disagree (SD).

21% strongly agree and 69% agree that Telemedicine will help in easy access of health care service for rural patients. 19% strongly agree and 67% agree that it will save travelling time and money for availing expert opinion. 15% strongly disagree and 69% disagree that it will help only the urban community. Almost half of the respondents deny that it will not help face to face consultation and also half of the respondents feel reliability of the consultation will be poor. One major acceptance of telemedicine is that it will prevent from worsening of

medical condition of the patient by giving instant consultation. 75% respondents almost feel the same. They (79%) also agree that only hospitals equipped with internet facility will implement telemedicine. It may be inferred the importance of internet facility is realised which is a challenging work in the rural areas of India.

**Table 1 Acceptance of features of Telemedicine**

Acceptance of Telemedicine	SA	A	NO	D	SD
Telemedicine will help in easy access of health care service for rural patients.	21	69	4	4	2
Telemedicine will save travelling time and money for availing expert opinion	19	67	8	6	0
Telemedicine will help only the urban community	0	6	10	69	15
Telemedicine can never help face to face consultation	8	33	13	44	2
Reliability of consultation by telemedicine will be poor	0	35	25	33	7
Telemedicine prevents from worsening of the medical condition of the patient	15	60	15	10	0
Telemedicine should be implemented in all the hospitals equipped with internet facility	27	52	15	0	6
Doctors will approve of tele medicine only after getting statistical reports of the benefits of tele medicine.	23	50	19	4	4

Table 2 depicts the benefits of telemedicine acknowledged by doctors through the survey. Mostly the doctors have seen a great level of potential in the system of telemedicine that can be implemented in rural areas for the benefit of patients. 94% of the respondents feels laboratory result can be obtained via internet, 88% agree that transmission of X-ray and still photo is possible, 85 % agree that internet can be used for making outpatient appointments, 85% said it would be beneficial to have teleconferencing with patients whereas 77% feel it will be important for videoconferencing between health care professionals and lastly 73% of healthcare professionals said people in rural areas may use telemedicine for obtaining second opinion.

**Table-2: Application of Telemedicine would benefit the patient**

Beneficial to Patient	Yes %	No%	May be %
Obtaining Laboratory result via Internet	94	2	4
Making outpatient appointments using internet	85	10	4
Transmission of X-ray, still photo	88	10	2
Teleconferencing with patients	85	6	8
Videoconferencing between health care professionals	83	4	13
Monitoring Patients at home for follow-up	77	15	8
Obtaining second opinion	73	10	17

The barriers in implementing tele-medicine is depicted in Table 3. The most common barrier in implementing telemedicine is lack of consultation between IT experts and clinicians (90%), and Lack of Training and loss of effective communication (85%) which requires an interference of a third party who can build trust factor within patients with having good rapport with doctors. The medium should have a potential to create good infrastructure that is required. As lack of friendly software (79%) and high cost equipment (77%) are the next common barrier in implementing telemedicine.

**Table-3: Barriers in Implementation of Telemedicine**

Barriers	% Yes	% No
High cost equipment	77	23
Lack of Training	85	19
Concern about patient confidentiality	73	27
Lack of use of friendly software	79	21
Lack of consultation between IT experts and clinicians	90	10
Loss of effective communication	85	15

Table 4 depicts the role of Health Entrepreneur in removing barriers. As per the survey taken, the respondents highly agreed that health entrepreneurs will be able to use friendly software (92%), provide training (90%), can

bring effective communication (83%). They have very least faith on solution to high cost equipment where IT experts have a greater role to play.

**Table-4: Role of Health Entrepreneur in removing barriers**

Health Entrepreneurs can remove Barriers	% Yes	% No	May be%
High cost equipment	71	8	21
Lack of Training	90	6	4
Concern about patient confidentiality	77	6	17
Lack of use of friendly software	92	4	4
Lack of consultation between IT experts and clinicians	81	8	10
Loss of effective communication	83	10	7

## Role of Health Entrepreneur in Implementing Telemedicine

Challenges	Requirement	Solution
High cost equipment	High Investment in health care sector	They can collaborate with banks and private investor to increase the investment in health care sector.
Lack of Training	Trained workforce	Training School on medicine and web technology
Concern about patient confidentiality	Build trust among local people	Organize health camp and creating awareness about preventing diseases.
Lack of use of friendly software	Trained IT personnel	Make a group of young IT personnel in remote areas to provide the services.
Lack of consultation between IT experts and clinicians	Linkages between internet and delivery of healthcare services	Try to connect both the parties in the same platform that is a web based technology.
No Infrastructure	Build infrastructure	Create centre in every locality where there will be a web based set up with IT and health care personnel to connect the patients to their respective specialists.
Loss of effective communication	Work on Brand	Try to collaborate with Govt to create image and brand so that people will communicate effectively without hesitation.

## CONCLUSION

The rural areas in India are able to receive proper health facilities due to many reasons such as lack of infrastructure, lack of health care provider and doctors. To solve this problem health entrepreneur can be a mediator between patient and health care provider who will understand the challenges people and the locality face and act accordingly by giving the best solution. The study concludes that the identified challenges are important to attend and similarly to a large extent it is suggested that entrepreneur will solve the process of implementation of telemedicine. The study also takes the views of the health care professionals that telemedicine may not completely subside the role of hospitals. It should be only used in case of lack of accessibility to health care services. But certain features like taking second opinion, transferring data, telemedicine will be useful.

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## Peoples Preference, Awareness and Popularity Towards, Allopathic, Unani Ayurveda and Homeopathic System

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### ABSTRACT

*Health is a major concern for people today. Indian healthcare industry is having a variety of indigenous systems like yoga, naturopathy, Siddha, Unani as various other forms of health care systems like homeopathy. Thus traditional systems have been playing an important role in meeting the health care of Indians as well as global health care need. Apart from these there are many healers hidden in the rural areas who are not organized under any categories. This research paper helps to understand the extent to which people accept Ayurveda and homeopathy have a holistic approach to health and personalized medicine. Even though there is an availability of modern medical system a large amount of people prefers Ayurveda or homeopathy. These are the oldest medical system that can help in treating many chronic diseases like cancer, diabetics, arthritis, and asthma, which have no absolute cure in modern medicine. As there is easy availability, affordability and safety the traditional systems have survived from centuries. Not only in India but in many foreign countries people are looking for some alternative medical approaches that have minimum side effects to meet their health problems. This paper wants to put light on the current preference of persons to use allopathic, Ayurveda and homeopathic system of medication*

**Keywords:** Health, healers, Ayurveda, homeopathy, preferences, awareness

### I INTRODUCTION

If we see the trend now people are moving to more herbal medication and searching for ayurvedic, unani and homeopathic treatments to cure diseases. This research paper throws light on the preference of persons where it comes to common sickness and their preference during an emergency. The herbs and plant medicine used in traditional medical system and have no side effects due to which they are becoming increasingly popular. As time passed people Synthetic medicines of allopathy replaced the traditional, aromatic flavoured ayurvedic, unani and homeopathic medicines. In case of chronic diseases Ayurveda, homeopathy and Unani medicines work very effectively, but most of the people prefer allopathy due to the ability of allopathy to give fast relief. But most of the allopathy medicines have toxic side effects. Moreover, the cost of health care by using allopathy is very high which is making people to search for alternative sources of medication. If the competency of ayurvedic, unani a homeopathic medicine can be improved without compromising on their fundamental principles then these medicines can be promoted extensively.

Allopathy medicines do have a cure for many sicknesses but have many side effects. But ayurvedic, unani and homeopathic medicines heal the human body as a whole. The best system of medicine is the one that can care and cure. Example early detection of cancer by symptoms and healing by ayurvedic, unani and homeopathic medicines.

### OBJECTIVES OF THE STUDY

- This study helps to judge the awareness of people about ayurvedic and homeopathic medicines
- To study the overall preferences of people during common ailments and medical emergencies.
- This study helps to understand the knowledge of people about ayurvedic and homeopathic medicines
- The role of pharmacists and government of promotion and use of these drugs.

### III BASIC LITERATURE REVIEW

Sr.No	Author(Year)	Research subject
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2.	Ernst E, Willoughby M, Weihmayr 1995	Nine possible reasons for choosing

		complementary medicine.
3.	Pan CX, Morrison RS, Ness J 2003	Complementary and alternative medicine in the management of pain, dyspnea and nausea and vomiting near the end of life: a systematic review.
4.	Status and role of AYUSH and Local Health Traditions under the National Rural Health Mission-Report of a Study, 2010	National Health Systems resource centre, National Rural Health Mission, Ministry of Health & Family Welfare, government of India, New Delhi,
5.	Ernst E, editors, complementary medicine: an objective appraisal Oxford: Butterworth Heinemann; 1996, Pp 71-88	Furnham A. Why do people choose and use complementary Therapies?
6.	Shailaja Chandra, , New Delhi110058,2002.	Role of Traditional Systems of medicine in national health care systems, Traditional Medicine in ASIA
7.	Ministry of Health and Family Welfare, Government of India	A technical Report, Central Council for Research in Ayurveda & Siddha

## IV HISTORY OF AYURVEDIC, UNANI AND HOMEOPATHY MEDICINES

### History of Ayurvedic medicines

The ancient rishis and seers of India have gifted us with Ayurvedic medicines which they received from Hindu Gods 5000 years ago. The necessary information how to achieve healthy body was recorded in their texts that is the Vedas and the Atharva Vedas .The rishis and minis of India spent major part of their lives on the study of truth about the universe and passed it to the disciples and the knowledge bank of Ayurvedic medicines and this has been passed on for 1000s of years .All the discoveries have been recorded in the holy book of Vedas .From these one of the vedas Atharva Vedas has been compiled in 900 BCE. It is very comprehensive and is considered to be the knowledge of Indian ancient medical practices .

### History of Unani medicines

Unani medicines is an Arabic medicine system or also called as Islamic system of medicine.

It is a traditional system of healing and health maintenance and is seen mostly in South Asia.The origin of unani medicines is found in Greek doctrine of Hippocrates and Galen two Greek physicians. The history of unani medicines can be characterized by the work of its practitioners or hakims who relied on natural healing based on the principle of harmony and balance uniting the physical , mental and spiritual realms. Unani Hakims feel that they will only assist from outside by prescribing therapeutic relief.

There are various therapeutic approaches available to Hakim.Illaj-BI-Ghiza or dietotherapy involves recommending a specific diet which is the simplest and natural course of treatment by a hakim.Eg In Fever the unani medicine stresses a nutrient –rich ,low roughage diet that might include porridge and Keer.

### History of Homeopathy medicines.

Homeopathy is a system of therapies and is based on law of similars which was introduced in 1796 by German physician Samuel Hahnemann. He believed that large doses of drugs aggravates illness and the efficacy of the medicine increases with dilution and most homeopaths believe in the action of minute dose of medicine. There are many national and international societies including international Homeopathic medical League headquarter in Kothen Germany.

## V CONTROVERSIES OF AYURVEDIC ,ALLOPATHY AND HOMEOPATHY SYSTEM OF MEDICATION

Sometimes Ayurvedic , Homeopathy and Unani system of medication shows side effects. In a survey conducted and samples collected of commercially prepared Ayurvedic , Homeopathy and Unani drugs purchased online had 21% of lead, mercury and arsenic found .

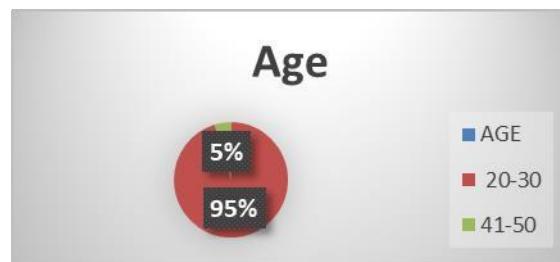
In ayurvedic medicines the rasa-shastra medicines have been detected with more of these toxic material than non rasa-shastra medicines. These toxic material affect the body adversely. Thus there is a need for standardization of ayurvedic formulations before allowing them to be bought in the market for sale.

## VI RESEARCH OF AYURVEDIC , HOMEOPATHY AND UNANI SYSTEM OF MEDICATION

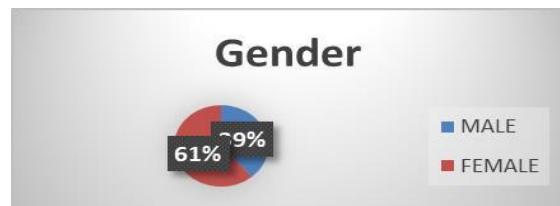
The Ayurvedic , Homeopathy and Unani system of medication are playing an important role in healthcare but the research scholars are not sure about their views about the future of Ayurvedic , Homeopathy and Unani system of medication. There are a few well established research centers with the necessary infrastructure for the exclusive research work that is needed to be done to improve the competency of these medicines. If the quality of these medicines have to be improved then exclusive research is the need of the hour . this can only be achieved if more well equipped research center's for Ayurvedic , Homeopathy and Unani system of medication are set up . This initiative depends upon the government. Thus one more profession of researcher in Ayurvedic , Homeopathy and Unani system of medication will help the post -graduates that pass out each year and enter into the main stream of academics and practice .

The teaching methodologies of Ayurvedic , Homeopathy and Unani system of medication need to be updated which have not changed for the past 50 years.

## VII Data Analysis



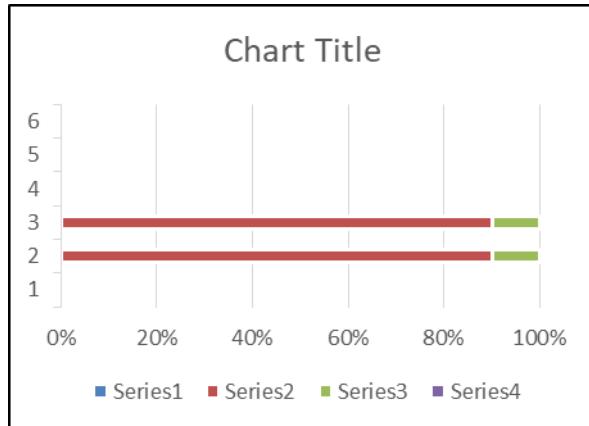
AGE	%
20-30	95.45
41-50	2.10



GENDER	%
MALE	38.64
FEMALE	61.36

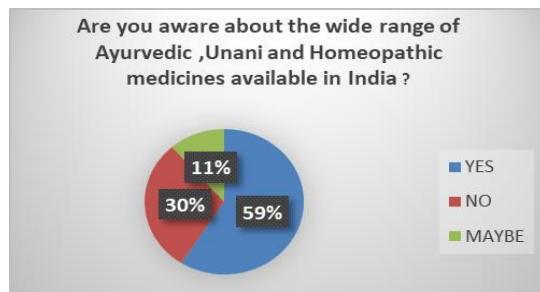


Occupation		%
A)Service	4	9.09
B)Self Employed	20	45.45
C) Student	20	45.45



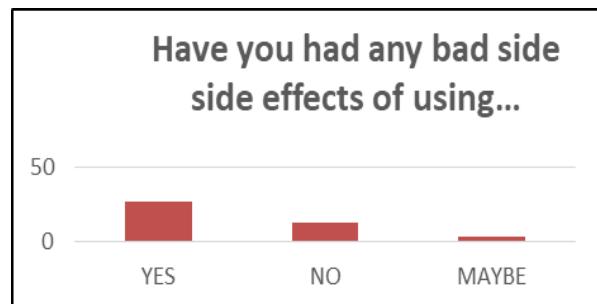
**Are you aware about Ayurvedic ,Homeopathy and Unani Medicines ?**

YES	37	84.09	
NO	4	9.09	

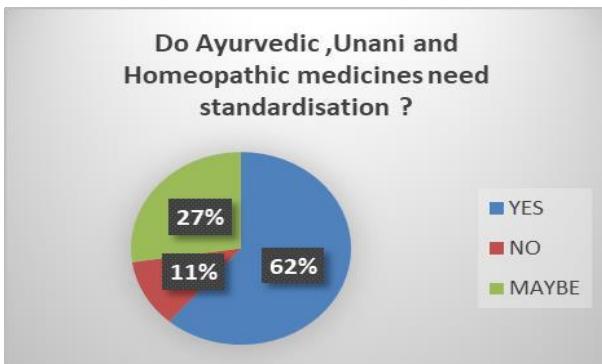


**Are you aware about the wide range of Ayurvedic, Unani and Homeopathic medicines available in India?**

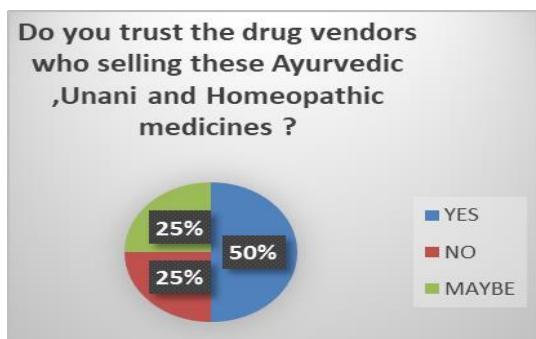
YES	26	59.09
NO	13	29.55
MAYBE	5	11.36



Have you had any bad side side effects of using Ayurvedic, Unani or homeopathic medicines ?				
	YES	27	61.36	
	NO	13	29.55	
	MAYBE	4	9.09	



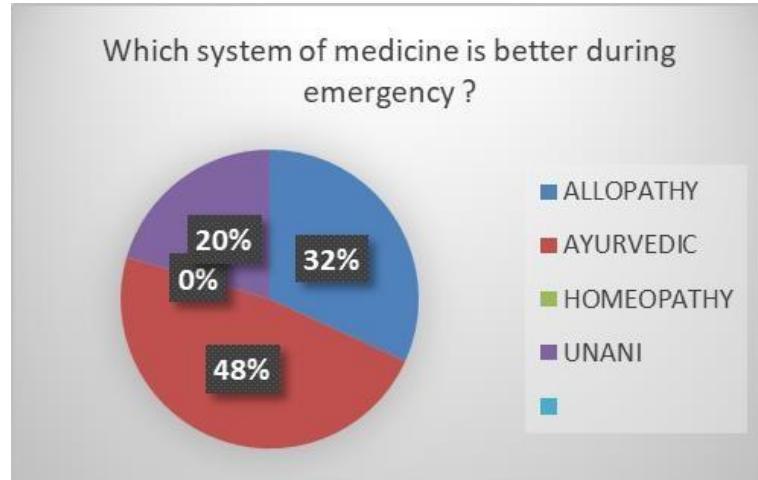
Do Ayurvedic ,Unani and Homeopathic medicines need standardisation ?		
YES	27	61.36
NO	5	11.36
MAYBE	12	27.27



Do you trust the drug vendors who selling these Ayurvedic ,Unani and Homeopathic medicines ?		
YES	22	50.00
NO	11	25.00
MAYBE	11	25.00

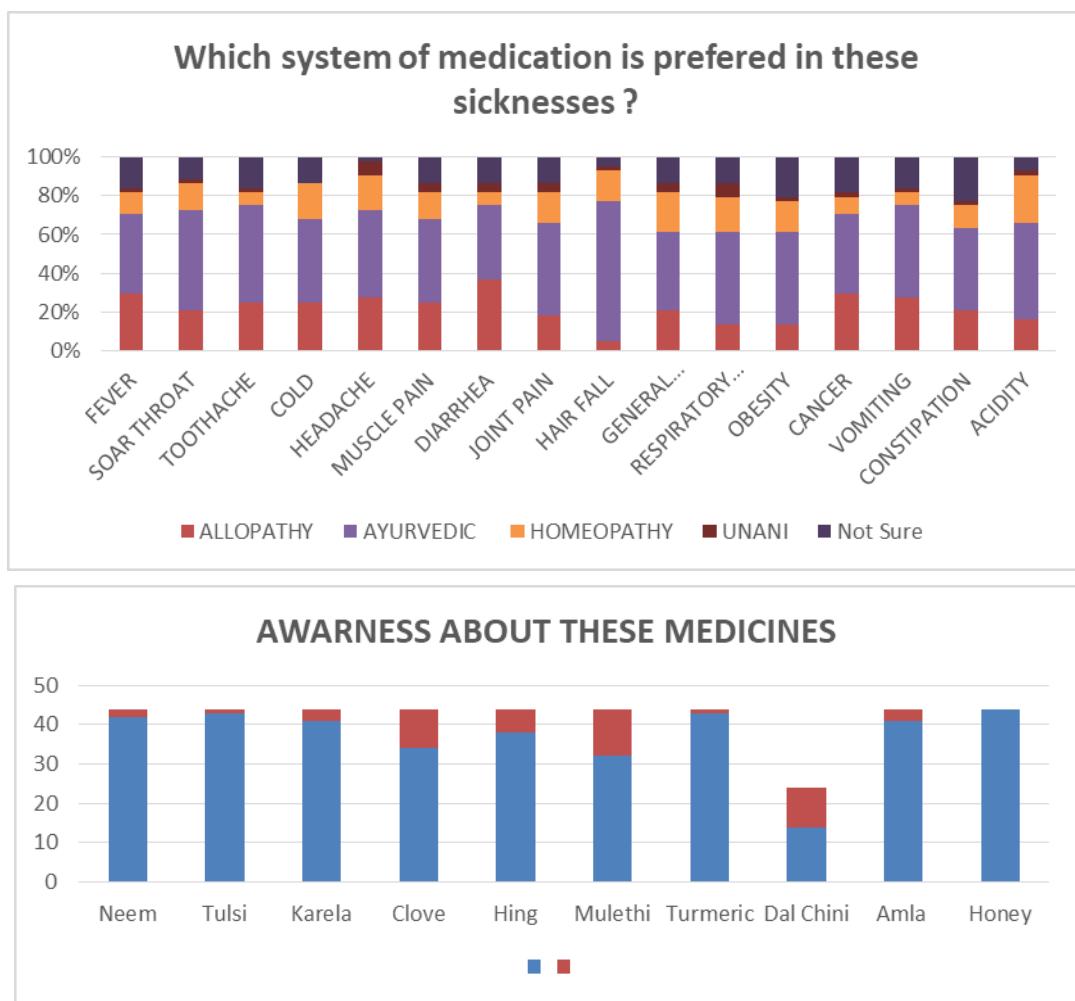


Which system of medicine is better ?		
AYURVEDIC	15	34.09
HOMEOPATHY	25	56.82
UNANI	4	9.09



Which system of medicine is better during emergency ?		
ALLOPATHY	14	31.82
AYURVEDIC	21	47.73
HOMEOPATHY	0	0.00
UNANI	9	20.45

Which system of medication is preferred in these sicknesses					
	ALLOPATHY	AYURVEDIC	HOMEOPATHY	UNANI	Not Sure
FEVER	13	18	5	1	7
SOAR THROAT	9	23	6	1	5
TOOTHACHE	11	22	3	1	7
COLD	11	19	8	0	6
HEADACHE	12	20	8	3	1
MUSCLE PAIN	11	19	6	2	6
DIARRHEA	16	17	3	2	6
JOINT PAIN	8	21	7	2	6
HAIR FALL	2	32	7	1	2
GENERAL WEAKNESS	9	18	9	2	6
RESPIRATORY PROBLEMS	6	21	8	3	6
OBESITY	6	21	7	1	9
CANCER	13	18	4	1	8
VOMITING	12	21	3	1	7
CONSTIPATION	9	19	5	1	10
ACIDITY	7	22	11	1	3



## VIII FINDINGS AND DISCUSSIONS

- According to the survey conducted 35% persons were Males and 61% were females.
- 31.82% Preferred allopathy 47.73% preferred ayurvedic and 20.45% unani medicines in case of emergency.
- Ayurvedic system of medication is the highest preferred in these various sicknesses sickness.
- 50% of the respondents trust the drug vendors who are selling these Ayurvedic, Unani and Homeopathic medicines
- On an average 40% persons know about home remedies.

## IX CONCLUSIONS

Most people agree that of Ayurvedic, Unani and Homeopathy medicines have no side effects. People believe that these medicines though good the vendors honestly is not guaranteed and therefore it needs to be cross checked by government measures and controlled by standardization

## X SUGGESTIONS

Pharmacists can create major role by increasing stock of Ayurvedic, Unani and Homeopathy medicines by educating people about benefits of their medicines. Even government should promote about these medicines on one side and have strict control by having standardization and licensing on these drugs and also proper quality checks. These medicines should be made tax free so maximum people can avail of the benefits of these medicines.

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## An analytical study on low numbers of blood donors with special reference to Mumbai City

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### ABSTRACT

*This paper talks about the reasons of low rate of blood donation in India with reference to Mumbai City. This paper explains the problems and challenges faced by government to promote blood donation. Suggestion to the problem and challengers are also prescribed in the research paper.*

*Keywords: Blood Donation, Awareness of blood donation and Donor*

### 1. INTRODUCTION

**1.1.** Blood donation is a voluntary process and hence money is not provided in India as well as Mumbai city.

In some places of India 450ml of blood is donated however in Mumbai area 350ml of blood is only collected. A person can donate blood in every 3 months according to the medical terms however in many camps in Mumbai a donor is asked to donate blood only after 6 months.

Maharashtra had a surplus donation due to its high education and awareness programs. There are currently 61 blood banks in Mumbai city which are operating on authorized basis.

Mumbai city was the highest amongst the donation rate in the state. The requirements were fulfilled however sometimes there is still shortage of blood.

As per the data collected the main donors of blood were married and used to come even with their spouses. After them came the students. Donation can be done after 18 hence there were less students compared to married.

### 1.2. GAP BETWEEN DEMAND AND SUPPLY OF BLOOD

About 60 million trauma induced surgeries are performed in the country every year. It is a witness to more than 1,200 road crashes every day.

The 230 million major operations, 331 million cancer-related procedures like chemotherapy and 10 million pregnancy complications require blood transfusion. Other than these there are many more reasons such as normal blood loss in a person for a period of time which can be cured.

These people listed here cannot donated blood as they are facing their own issues which makes the number of fresh donors very less.

Education rate in India is very lesser compared to other developed countries hence blood donors are not aware about their merits after donation.

Mumbai is economical capital of India and has a high education rate and hence awareness about blood requirement is recognized by the citizens.

From 2013 to 2017 India has a wastage of 2.8million units of blood. In 2016-2017 alone over 6.58 lakh unit was discharged, and the worrying part is that 50% of the wasted unit was plasma that has longer shelf life of one year as compared to blood cells of 35-40 days.

This mainly due to lack of facility provided in health centers and due to mistreatment of blood.

Both private sectors as well as government sectors spread awareness about blood donation programs. In Mumbai on 1st October every year National voluntary blood donation day is celebrated, and hence various governmental schools participate in it. Banners and papers are spread everywhere so that people get aware about the issue existing in their area.

Government of Maharashtra spends a huge amount on education and hence every student's gets to know the value of blood and its donations. In the year 2010 all theatres of Mumbai city zone had to show the little

girl advertisement on blood donation awareness presented by the government. The video is of 45 seconds long and is about a little girl who thanks every person she sees as she has thalassemia and is surviving only because of blood donors.

### **1.3. QUESTIONS ASKED BEFORE DONATING BLOOD IN MUMBAI.**

A form is filled by the questionnaire who manages the donating process. The questions included :-

1. Name of the donor
2. Age of the donor
3. Dob of the donor
4. Profession of the donor
5. Weight of the donor
6. Medical history (if any medical history is found than they take precautions accordingly. Treatment of risky medical issues such as HIV, TB, CANCER and mainly questioned. These questions are designed to take precaution and check the health of the donor.)
7. Intake of alcohol before 24 hours of donation is not allowed and details about when and how many times the donor smokes in a day. Tattoo if any will be questioned.
8. Checking of blood pressure
9. Finger prick test (the test is performed to check the hemoglobin level of the donor which should be in a normal range while donating. It is also done to confirm the blood group of the donor.)
10. Your sign will be taken on your information sheet to confirm everything is right.

### **2. REVIEW OF LITERATURE**

- **Thakur A, Chauhan HS, Acharya B. (2015)** The requirement for blood and blood items is expanding all through the world, and appropriate medicinal consideration is just conceivable if this developing need is met by a higher pace of donations. When all is said in done, if sheltered and sufficient blood isn't gathered through deliberate blood donation, blood security, and thus, individuals' wellbeing will be compromised.
- **Semenza JC, Domanović D. (2013)** Regardless of noteworthy advancement in the field of clinical sciences, enrollment of safe blood donors and keeping up an adequate inventory of safe blood stays a challenge
- **Aslani Y, Etemadyfar S, Noryan K. (2010)** There is quite often a dire requirement for blood to spare an actual existence; in this way, it is basic that emergency clinics and earnest centres consistently have prompt access to a specific measure of blood and its related items. The previously mentioned underscores the significance of enrollment of safe blood benefactors. To guarantee the best clinical results, proper and safe blood and blood items ought to be gathered and promptly accessible to be utilized in uncommon ailments.
- **Jalalian M, Latiff L, Hassan ST, Hanachi P, Othman M. (2010)** Considered self-revealed helpers, obstructions of blood donation and announced that blood benefactors who knew about the medical advantages of blood donation were all the more ready to give blood later on. Different examinations have likewise inspected the components affecting and anticipating blood donation and even created instruments (surveys) to research these elements. Many these examinations have concentrated on overall public or simply the blood contributors. College understudies' disposition, information, and conduct towards blood donation have been concentrated to a less degree.
- **Germain M, Gélinas S, Delage G. (2004)** Youthful and instructed individuals are viewed as more secure blood contributors since the lingering danger of transfusion-transmissible contaminations is thought to be lower in this populace. Regardless of the way that the gave blood consistently experiences broad fitting testing according to proposals by the World Health Organization, the remaining danger of transfusion-transmissible diseases is constantly present. This is mostly because of the window time frame, i.e., the period among contamination and recognition of the infection by research facility tests. For instance, Human Immunodeficiency Virus (HIV) can be transmitted by transfusion of blood regardless of whether the blood unit is test-negative for HIV. This is to a great extent because of a window period during which antibodies against HIV are not discernible.

### **3. RESEARCH METHODOLOGY**

#### **3.1. PURPOSE OF THE RESEARCH**

(WHO) WORLD HEALTH ORGANIZATION records the data provided by 195 countries and territories out of which 119 countries were not up to their requirements of blood donations, India was one of those 119 nations which failed to collect their demand.

In 2018 India required a total of 13.4million units of blood out of which only 11.45million units of blood was collected. Nearly 2million units of blood was less which is equivalent to 60 tankers. People even die due to not receiving blood on time.

Government had introduced various plans at various places which led to increase in donors year after year however each year we were short of demand.

#### **3.2. OBJECTIVES OF THE RESEARCH**

- To understand the reason of low rate of blood donors in Mumbai
- To know the awareness of blood donation in Mumbai

#### **3.3. METHODS OF DATA COLLECTION**

- **Primary data** is collected through questionnaire filled by 100 respondent.
- **Secondary data** is collected from Journals, Magazines, Newspapers and various Websites.

#### **3.4. RESEARCH DESIGN**

The research design deployed was exploratory research design. It is descriptive in nature.

#### **3.5. DELIMITATIONS OF THE RESEARCH**

The research is conducted in Mumbai city zone by filling questionnaire from 30 donators and 70 non-donators.

#### **3.6. LIMITATIONS OF THE RESEARCH**

The research has physical and economical constraint. Not every blood bank provided us the data and hence their staff had to be asked personally. Pedestrians from various areas were non-cooperative.

#### **3.7. DATA ANALYSIS METHODS**

Data is collected from various people irrespective of their gender, age, status and from various websites were taken to know the exact statistical data to generalize the findings and draw conclusions of the research study.

### **4. FINDINGS**

- Common reasons for not donating bloods are:
  - People are afraid of needles
  - People are busy, so have no time for donating blood
  - Afraid of weakness after donation
  - People think they may get sick easily hence after donation they will get weak
  - Their blood is not rich enough for donation
  - They need to earn for their house and if any disease caught them who will take care of them
  - Women get menstruation hence they get weak and their hemoglobin level are also low because of which they are not eligible to donate blood
- India has a huge population, but the donors are very less
- Every year the demand is increasing gradually
- Most of the people are not aware about the scarcity of the blood
- People who have faced problems of blood before in their life, are ready to donate
- Mumbai is still a better place according to the statistics compared to other states.
- Blood donation is a voluntary process and hence money cannot be provided

- Special benefit given only to donors. Amount for blood in Mumbai at average is 1200 per bag (350ml), however a donor who has the donating certificate can collect the same amount of blood at a very cheap rate of Rs. 200-250 per bag (350ml).

## 5. CONCLUSION

Most of the people living here are either busy or selfish as they have time and are healthy but do not want to donate. People are unaware about the demand of blood and its scarcity. India is way behind to other countries in saving their citizens and making them aware of it. Many people want to donate but are not able to donate it because they are not healthy. Scarcity of blood is increasing, but Government is not considering it. Mostly while operation to maintain the inventory of the blood bags in the hospital, patient relative or friend must donate equal numbers of blood bags which had been used in the operation. Donors just get certificate after donation, they do not get any extra facility which will motivate them to donate blood.

## 6. SUGGESTIONS

- Government should spread more awareness through various media.
- Awareness should be spread in such way that person who is donating blood should also get the knowledge about positive impact of blood donation on that person. For example,
  - Donating blood reduces the risk of cancer and reduces risk of damage to liver and pancreas.
  - A blood bag can save up to 3 lives.
  - An Obese person can also donate blood on a regular basis to reduce weight and stay fit.
  - Blood donation also purifies the bloods, as new blood is generated.
- Government can take help University students through NSS, NCC, DLLE etc.
- Facility like half day leave or full day leave should be provided.
- In Tirupati to promote blood donation, they have special scheme if a person donated blood he gets the darshan directly without standing in any queue. Similar scheme should be made across India.

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## Recent Trends of the Pharmaceutical Industry in Foreign Direct Investment in India with Reference to Make in India

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### ABSTRACT

*FDI is one of the most interesting topics in the area of international business and trade. FDI assumes a lot of importance because it can influence many micro and macro economic variables of a host country. It has its impact on employment, exports, imports, prices, BOPs economic growth, competition, production investment etc. FDI represent one of the most important instrument through which a national economy can encourage production, know-how imports, increase in employment, infrastructure development, poverty reduction etc. the benefits achieved through the increase in FDIs have created strong competition in the global market of free capital, all with the aim to attract as many and as diverse FDIs as possible. The general trend in the global FDI market is the erasure of geographic borders between developing countries and developed ones as in the past years, developing countries have not only represented a growing FDI market, but have also been aimed at attracting capital intensive investments as well as R&D investments. The pharmaceutical industry is classified as one of the most high-tech and capital intensive industries. It is considered as the 'life line' industry because its products play a crucial role in remedying the suffering of diseased persons. It is also a significant contributor to the strength of any economy by creating jobs for millions and contributing to the export earnings. The distinctive feature of this industry is such that the goods produced by this sector can neither be substituted nor replaced. The pharmaceutical industry is one of the basic industries of the country. From simple headache pills to sophisticated antibiotics and complex cardiac compounds, almost every type of medicine is now made indigenously.*

*Keywords: FDI, Sector –wise development, Make in India, Pharmaceutical industry growth.*

### INTRODUCTION

The Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value, as per a report by Equity Master. India is the largest provider of generic drugs globally with the Indian generics accounting for 20 per cent of global exports in terms of volume. Of late, consolidation has become an important characteristic of the Indian pharmaceutical market as the industry is highly fragmented.

India enjoys an important position in the global pharmaceuticals sector. The country also has a large pool of scientists and engineers who have the potential to steer the industry ahead to an even higher level. Presently, over 80 per cent of the antiretroviral drugs used globally to combat AIDS (Acquired Immuno Deficiency Syndrome) are supplied by Indian pharmaceutical firms.

The post-liberalization period witnessed an increasing trend of FDI inflows in India with a high growth rate. The relaxation of policies towards international trade and investment supported by a positive response from capital exporting countries is also considered as a major determinant of FDI inflows into India. Moreover, Foreign Direct Investment (FDI) and the post - liberalization scenario became the most fascinating topics among researchers in the area of international trade and investment. It is an important type of fast international expansion to increase ownership of assets, derive location-specific advantages and acquire additional knowledge. FDI in industrial sectors in India has become a point of discussion among the researchers and industrialists. Whether it is service sector or information technology or telecommunication sector or manufacturing sector, there is a continuous fluctuation in FDI inflows into these sectors over the years. FDI has been the target for Indian industrial sectors with a changing pattern of inflows. FDI in Pharmaceutical Industry has also been among the hot topics of discussions whether it is entry route or entry cap. The Indian Pharmaceutical Industry is amongst the top industries in the global pharmaceutical market and ranks 3rd in terms of volume of production (10% of global share) and 14th largest by value. The UN-backed Medicines Patent Pool has signed six sub-licenses with Aurobindo, Cipla, Desano, Emcure, Hetero Labs and Laurus Labs, allowing them to make generic anti-AIDS medicine TenofovirAlafenamide (TAF) for 112 developing

countries. With ever increasing returns, lowering risks and anticipated multifold growth, investors are more interested in this industry than ever before. Since 2000, the drugs and pharma sector has attracted one of the highest foreign direct investment (FDI) inflows of approximately \$12,689 million (April 2000 to September 2014).

## INDIA: THE NEXT R&D DESTINATION

The privatization and globalization policy of the government of India in the mid-1990s provided incentives to R&D in the pharma sphere. Innovative products were given exemption from price control, a number of financial schemes were made available to firms for undertaking R&D, technology collaborations were brought under the automatic approval route, and patent rights were granted for a period of 20 years for products as well as processes.

This incentivisation created a seismic shift from the practice of only manufacturing to a practice of innovation. India was previously known as the generic capital of the world owing to the widespread reverse engineering industry, this is now changing and companies in India have started to develop and innovate drugs.

More than 870 multinational companies have set up their R&D operations in India since 1985, the first one being Texas Instruments.<sup>16</sup> The prime reasons why R&D in India is viewed as beneficial are:

- **Cost effectiveness:** The cost of setting up world class R&D facilities in India cost a fraction of what they do in the west. The overall R&D costs are about one-eighth and clinical trial expenses around one-tenth of western levels;<sup>17</sup>
- **Skill:** A large pool of English speaking technical skill power is available at a low cost with highly developed R&D oriented skill sets;
- **Established R&D centers:** Pre-established state of the art R&D centers offer logistic convenience and cost effectiveness;
- **Growing biotechnology industry:** Indian biotechnology industry has grown by leaps and bounds and has some world class players;
- **Market access:** India is one of the fastest growing markets in the world. R&D in India allows companies to gain a foothold in this new and growing market;
- **Rising household incomes:** The growing middle class in India is an attractive market for drugs. With increasing disposable incomes, the market for non-essential drugs, is set to grow rapidly;
- **Governmental incentives:** Post the liberalization era, the Indian government has offered numerous incentives to R&D in India; and
- **Biodiversity:** Some drugs aimed at the Indian market require certain gene specific R&D and clinical trials. India's rich genetic biodiversity offers a perfect destination for such R&D and clinical trials.

Pharma R&D in India is expected to witness exponential growth in the near future, and with the growth of the economy and the pharma industry in India, innovation assumes new economic importance in the Indian pharma industry.

## FUTURE OF INDIAN PHARMA INDUSTRY

The Indian pharma industry has come a long way and made significant progress in infrastructure development and technical and R&D capabilities. With the integration of the Indian pharma market with the global market, new issues are being faced and tackled by the industry. Some old challenges such as IPR and pricing continue to be contentious issues in the market. The trends of increased foreign interest in the markets and increased investments in R&D are expected to stay. With numerous strengths and a growing consumer class, the pharma industry in India may face certain legacy and new issues, but it is expected to grow multifold and continue to be an attractive investment destination.

## MARKET SIZE

The Indian pharma industry, which is expected to grow over 15 per cent per annum between 2015 and 2020, will outperform the global pharma industry, which is set to grow at an annual rate of 5 per cent between the same period!. The market is expected to grow to US\$ 55 billion by 2020, thereby emerging as the sixth largest pharmaceutical market globally by absolute size, as stated by Mr Arun Singh, Indian Ambassador to the US.

Branded generics dominate the pharmaceuticals market, constituting nearly 80 per cent of the market share (in terms of revenues).

India has also maintained its lead over China in pharmaceutical exports with a year-on-year growth of 11.44 per cent to US\$ 12.91 billion in FY 2015-16, according to data from the Ministry of Commerce and Industry. Imports of pharmaceutical products rose marginally by 0.80 per cent year-on-year to US\$ 1,641.15 million. Overall drug approvals given by the US Food and Drug Administration (USFDA) two Indian companies have nearly doubled to 201 in FY 2015-16 from 109 in FY 2014-15. The country accounts for around 30 per cent (by volume) and about 10 per cent (value) in the US\$ 70-80 billion US generics market.

India's biotechnology industry comprising bio-pharmaceuticals, bio-services, bio-agriculture, bio-industry and Bioinformatics is expected to grow at an average growth rate of around 30 per cent a year and reach US\$ 100 billion by 2025. Biopharma, comprising vaccines, therapeutics and diagnostics, is the largest sub-sector contributing nearly 62 per cent of the total revenues at Rs 12,600 crore (US\$ 1.88 billion).

## INVESTMENTS

The Union Cabinet has given its nod for the amendment of the existing Foreign Direct Investment (FDI) policy in the pharmaceutical sector in order to allow FDI up to 100 per cent under the automatic route for manufacturing of medical devices subject to certain conditions.

The drugs and pharmaceuticals sector attracted cumulative FDI inflows worth US\$ 13.85 billion between April 2000 and March 2016, according to data released by the Department of Industrial Policy and Promotion (DIPP).

Some of the major investments in the Indian pharmaceutical sector are as follows:

- India's largest drug maker Sun Pharmaceutical Industries Limited has entered into a distribution agreement with Japan's Mitsubishi Tanabe Pharma Corporation to market 14 prescription brands in Japan.
- Syngene International Limited will be setting up its fourth exclusive Research and Development (R&D) center named Syngene Amgen Research and Development Center (SARC) for a US-based biotechnology company Amgen Incorporation in Bengaluru.
- India's third largest drug maker Lupin Limited plans to file its first bio similar Etanercept for approval in Japan, world's second largest drug market, in 2017.
- Rubicon Research Pvt Ltd, a contract research and manufacturing services firm, is in advanced talks with Everstone Capital and a few high-net-worth Individuals (HNI) to raise up to Rs 240 crore (US\$ 35.79 million), which will be used to increase the company's manufacturing capabilities.
- Lupin Ltd plans to acquire a portfolio of 21 generic brands from Japan-based Shionogi & Co Ltd for Rs 10.08 billion (US\$ 150.3 million), which will help to strengthen its presence in the world's second largest pharmaceutical market.
- International Finance Corporation (IFC), the investment arm of the World Bank, plans to invest up to US\$ 75 million in Glenmark, which is looking to raise around US\$ 200 million for expansion and the launch of several new products in India and other emerging markets over the next three years.
- Cipla Limited plans to invest around Rs 600 crore (US\$ 89.47 million) to set up a biosimilar manufacturing facility in South Africa for making affordable cancer drugs and its growing presence in the market.
- Russian Pharma, a firm which specializes in de-addiction and pain management products, plans to invest Rs 100 crore (US\$ 14.91 million) in a R&D center and a manufacturing unit in Kandla, located in Kutch District in Gujarat.
- Pink, Blue Supply Solutions Pvt. Ltd, a clinical supplies provider, has raised Rs 1.5 crore (US\$ 0.22 million) in a seed round of funding from Term Sheet.io, a transaction-focused service provider for start-ups and investors.

## GOVERNMENT INITIATIVES

The Government of India unveiled 'Pharma Vision 2020' aimed at making India a global leader in end-to-end drug manufacture. Approval time for new facilities has been reduced to boost investments. Further, the

government introduced mechanisms such as the Drug Price Control Order and the National Pharmaceutical Pricing Authority to deal with the issue of affordability and availability of medicines.

Mr Ananth Kumar, Union Minister of Chemicals and Petrochemicals, has announced setting up of chemical hubs across the country, early environment clearances in existing clusters, adequate infrastructure, and establishment of a Central Institute of Chemical Engineering and Technology. Some of the major initiatives taken by the government to promote the pharmaceutical sector in India are as follows:

- The Government of India plans to set up around eight mini drug-testing laboratories across major ports and airports in the country, which is expected to improve the drug regulatory system and infrastructure facilities by monitoring the standards of imported and exported drugs and reduce the overall time spent on quality assessment.
- India is expected to rank among the top five global pharmaceutical innovation hubs by 2020, based on Government of India's decision to allow 50 per cent public funding in the pharmaceuticals sector through its Public Private Partnership (PPP) model.#
- Indian Pharmaceutical Association (IPA), the professional association of pharmaceutical companies in India, plans to prepare data integrity guidelines which will help to measure and benchmark the quality of Indian companies with global peers.
- The Government of India plans to incentivize bulk drug manufacturers, including both state-run and private companies, to encourage 'Make in India' programme and reduce dependence on imports of Active Pharmaceutical Ingredients (API), nearly 85 per cent of which come from China.
- The Department of Pharmaceuticals has set up an inter-ministerial co-ordination committee, which would periodically review, coordinate and facilitate the resolution of the issues and constraints faced by the Indian pharmaceutical companies.
- The Department of Pharmaceuticals has planned to launch a venture capital fund of Rs 1,000 crore (US\$ 149.11 million) to support start-ups in the research and development in the pharmaceutical and biotech industry.

## ROAD AHEAD

The Indian pharmaceutical market size is expected to grow to US\$ 100 billion by 2025, driven by increasing consumer spending, rapid urbanization, and raising healthcare insurance among others. Going forward, better growth in domestic sales would also depend on the ability of companies to align their product portfolio towards chronic therapies for diseases such as such as cardiovascular, anti-diabetes, anti-depressants and anti-cancers that are on the rise.

The Indian government has taken many steps to reduce costs and bring down healthcare expenses. Speedy introduction of generic drugs into the market has remained in focus and is expected to benefit the Indian pharmaceutical companies. In addition, the thrust on rural health programs, life saving drugs and preventive vaccines also augurs well for the pharmaceutical companies.

## CONCLUSION

There is no doubt about the growth of the pharmaceutical industry. India may rank among the top five global pharma markets by 2030. Yet the domestic companies find it difficult in the current scenario. Some of the players quit the industry. Foreign companies are adding more competition to the domestic market by launching products in both branded and generic categories. It is the bounden duty of the Government to take care of domestic companies in this industry so that they have to align themselves to the existing scenario. With numerous strengths and a growing consumer class, the pharma industry in India may face certain legacy and new issues, but it is expected to grow multifold and continue to be an attractive investment destination.

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## A survey based study on Generic medicines in India

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### **ABSTRACT**

*One of the major obstacles for healthcare providers is healthcare cost. Cost of Medicines is one of the major elements of this increased cost of healthcare related expenses. Generic medicines have been playing an important role in reducing the cost and improving affordability. In today's era generic drug penetration is growing in all the major markets, but the proper domestic availability of generics and its quality use is still a question mark. Survey was conducted by the author on three groups: Educated population, uneducated population and Practicing Pharmacists. It is found that there is a major difference between prices of brand-name medicines and generic medicines. The different sets of questionnaire were prepared for each group and survey was conducted. The questions were designed to check knowledge, awareness, and preference of medication.*

**Keywords:** Brand-name medicine, Generics, Survey, Questionnaire.

### **18. INTRODUCTION**

According to World Health organization (WHO), medicines which are manufactured without licence from original innovator manufacturer are generic medicines and they usually manufactured after expiry of patent or exclusive rights [1]. Generic medicines are equally efficacious but very cost effective in comparison to branded medicines. According to press information bureau, government of India, the average price of its 10 tablet blister of Diclofenac tablets; a prescribed analgesic medicine is 52 Rs., while its generic counter parts are costing only 3.35 rupees per 10 tablets. In this case price difference is more than 15 times [2]. Government of India has taken many steps to regularize cost of essential medicines which are included in essential medicine list of India. Initiation of “Jan-aushadhi” store which offers quality medicines at affordable price is one of the major step in this regard. There were “Jan-Aushadhi” stores in 8 states of India as pilot projects and they have gained popularity [3].

Generics are promoted for those who cannot afford branded alternatives. On the contrary generics are safer alternatives to brand-name medicines. Generic medicines are like boons to healthcare agencies, consumers, insurers who want better cost effectiveness for medicines. Widespread use of generics can immensely benefit patients suffering from chronic diseases like Diabetes mellitus, Hypertension etc. [4].

Indian generics have become backbone of health policies of many developing countries as India is one of the leading manufacturers of generic medicines but awareness for generic drugs is very less in various stakeholders concerned with use of medicines i.e. prescribers, consumers, pharmacists and suppliers. Indian pharmaceuticals industry is considered as one of the leading exporter of generics in developing nations, but their contribution in promotion of generics in India is not remarkable. There are various studies done for prescription audit shows that generic drugs are not prescribed frequently [5-8]. So, overall promotion and awareness of generic medicines has to be increased in all the stakeholders concerned with generic medicines. Similarities and Differences between brand name and generic drugs [9]:

#### **1.1 SIMILARITIES**

According to the FDA, to substitute a generic for a brand name drug:

1. It must contain the same active ingredients (the chemical substance that makes the drug work).
2. It must have the same dosage strength (the amount of active ingredients, for example 20 mg or 40 mg).
3. It must be the same dosage form (that is, it needs to be available in the same form as the original—for example, as a liquid, pill, etc.)
4. It must have the same route of administration (the way the medication is introduced into the body).
5. It must deliver similar amounts of the drug to the bloodstream (that is, it needs to deliver a comparable amount of the drug into the bloodstream within a similar time period as the brand name drug).

## 1.2. DIFFERENCES

- They look different. (Federal law requires this.) – They could have different sizes, shapes, colours or markings. – They have different names.
- They might have different inactive ingredients. – Drugs are made up of both active and inactive ingredients. Some people may be sensitive to inactive ingredients. For example, some people have reactions to certain dyes used in some drugs.
- The generic costs less than the brand name drug. – The cash price and insurance co-pay is usually lower. Generics can cost between 20 and 80 per cent less, but keep in mind that cost is only one factor when considering the right medication for your condition.
- Generics vary by manufacturer, which means you could receive different versions based on where you purchase your medications and what type of generic they dispense. – Different pharmacies carry different generics. – Even the same pharmacy may change generic suppliers.

## 19. MATERIAL AND METHOD

A survey was conducted among the following group to know about their opinion towards the generic and branded medicines:

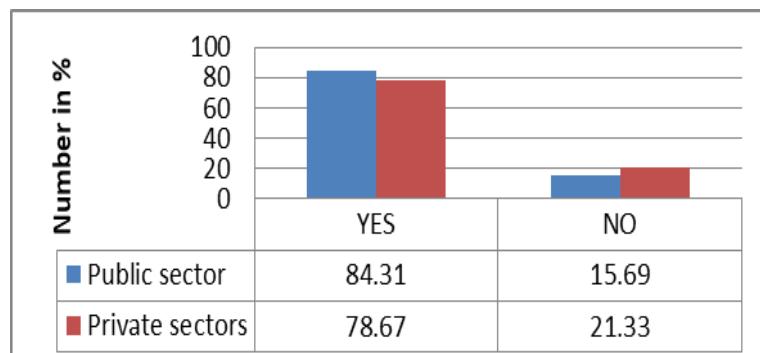
**Table1. Various groups**

Sr. No.	Type	Number
1	Patients belong to public sector	100
2	Patients belong to private sector	100
3	Pharmacists	50

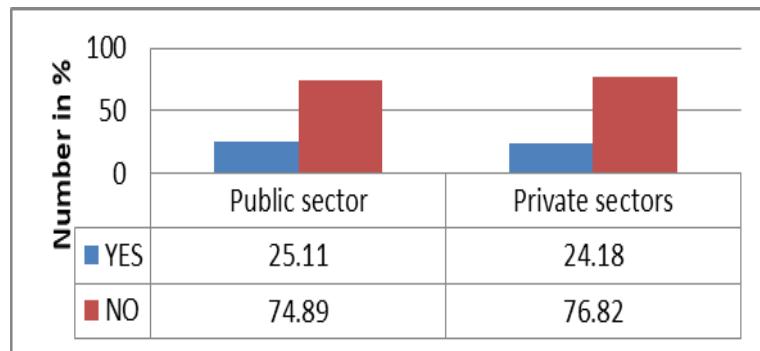
The different sets of questionnaire were prepared for patients and pharmacist and survey was conducted. The questions were designed to check Awareness, Knowledge and Preference of medication.

### 2.1 For patients belonging to public sector and private sectors:

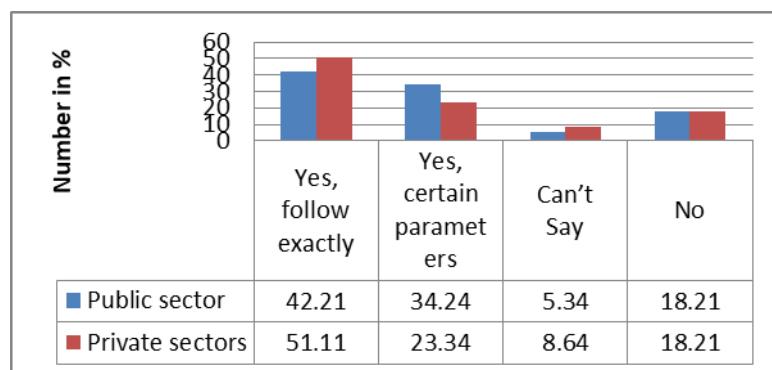
#### 1 Do you know about the law passed by government of India about generic medicines?



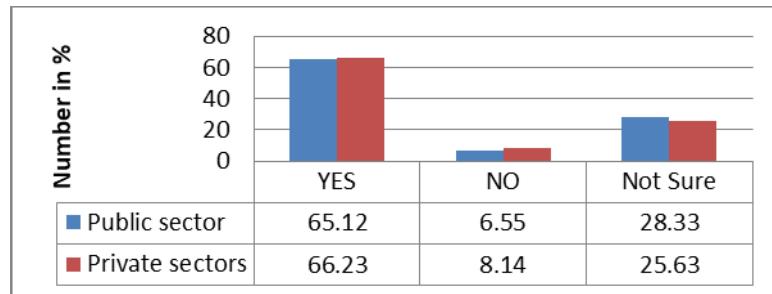
#### 2 Do you use generic medicines?



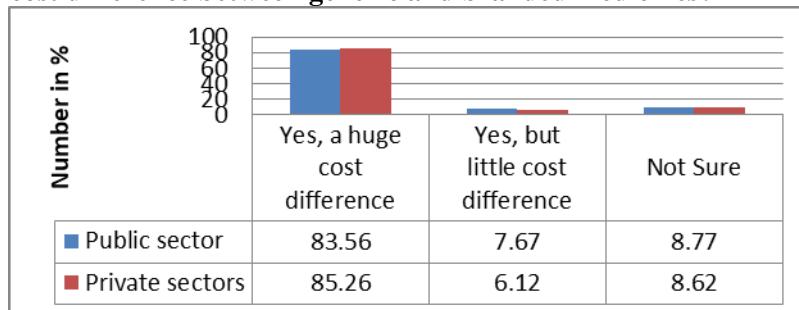
#### 3 Do generics follow the FDA guidelines as branded medicines?



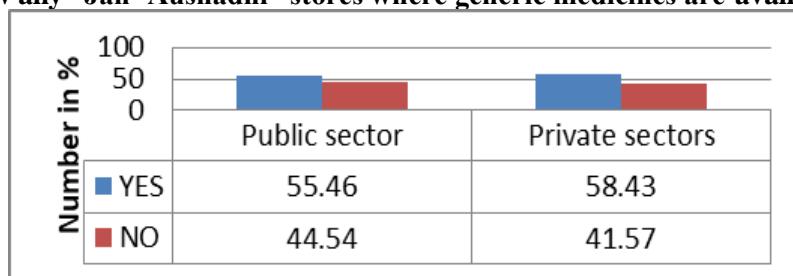
**4 Do generic medicines have same effect as branded medicines?**



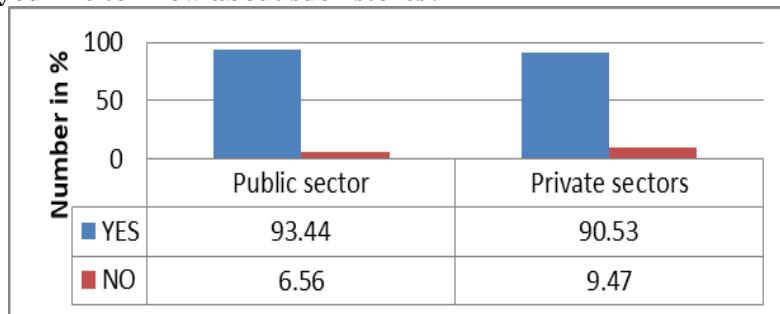
**5 Is there any cost difference between generic and branded medicines?**



**6 Do you know any “Jan- Aushadhi” stores where generic medicines are available?**



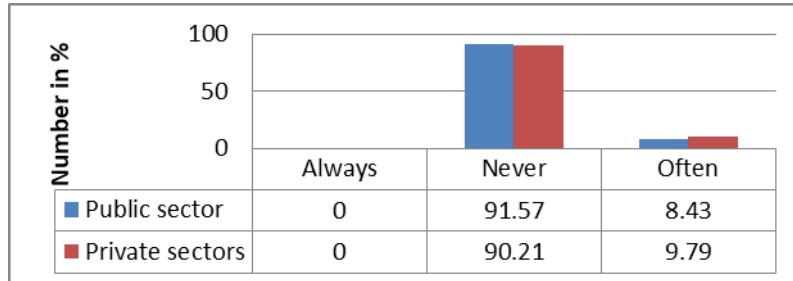
**7 If no would you like to know about such stores?**



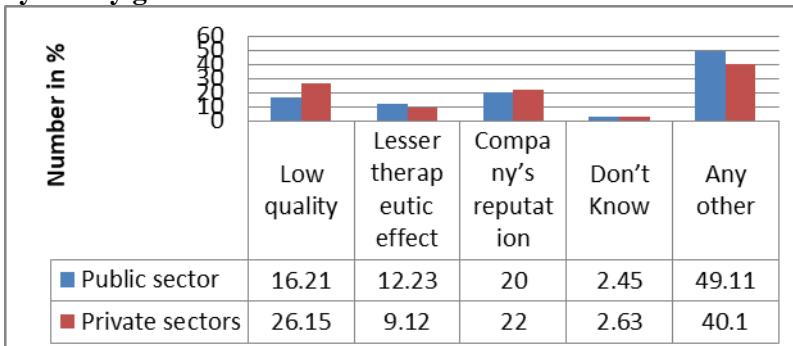
**8 Have you ever asked for generic medicines in medical stores?**



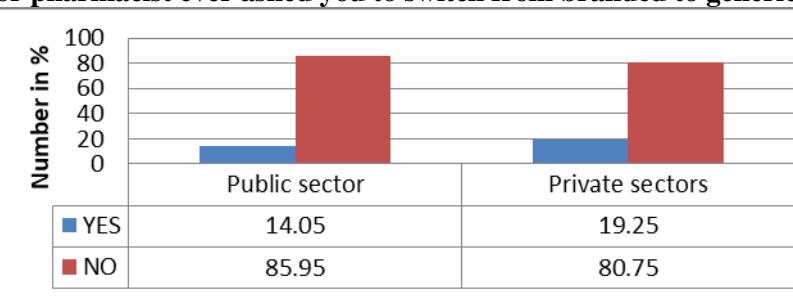
- 9 Have your doctor ever asked you if the cost of a medicine is a concern to you before he actually prescribed the medicine?



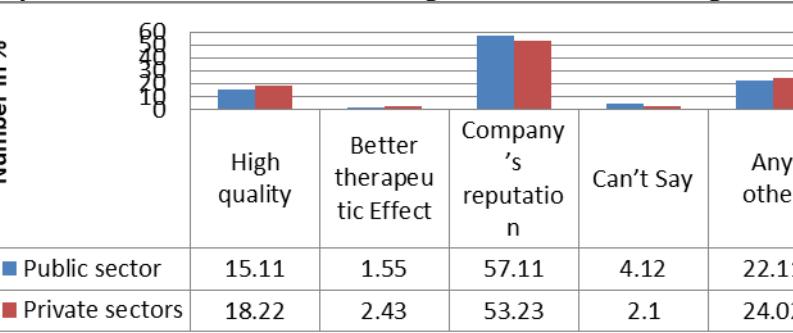
- 10 According to you why generic medicines have lesser cost?



- 11 Has doctor or pharmacist ever asked you to switch from branded to generic alternative?



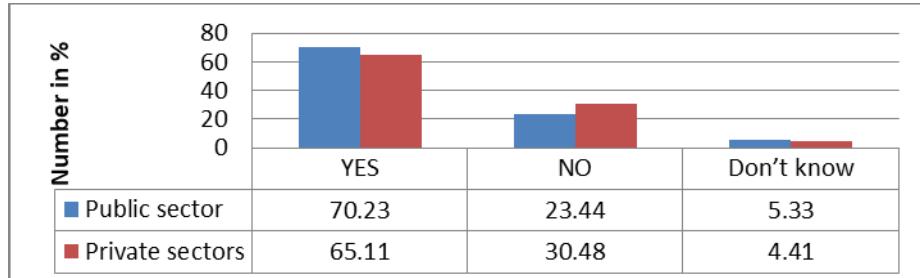
- 12 According to you what is the reason behind high cost of branded drugs?



- 13 Approximately how much you can save per month by using generic medicines?



- 14 Do you think Madhya Pradesh government should come up with stringent law for generic medicines?

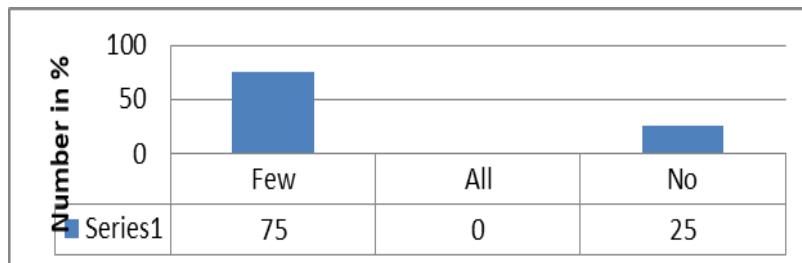


- 15 What are the disadvantages of generic medicines according to you?

Most of the people said that generics are less effective compared to its brand name medicine, many of them perceive generics to be of poor quality and few didn't know about disadvantages of generics.

## 2.2 For the pharmacist working in pharmacy:

1. Do you keep generic medicines in your pharmacy?



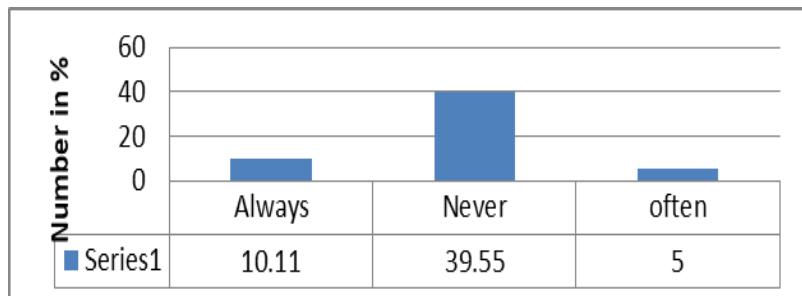
- 2 If no why? Specify.

Pharmacists had different reasons for not keeping generic medicines. Like Less demand and Less or no prescription

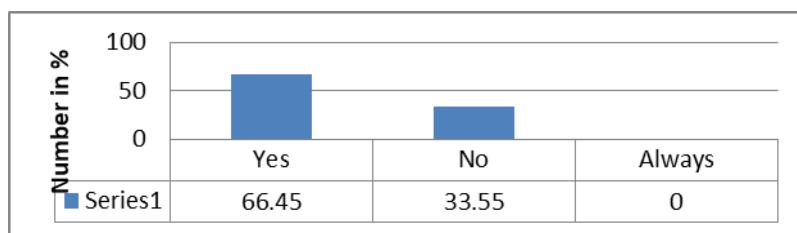
- 3 How many patients ask you for generic medicines/cheaper alternative to branded ones?

Majority of pharmacists responded as none followed by few and very less. Many of them said only 5 to 10 % patients ask about generics.

- 4 Do you suggest generic medicines to patients?



- 5 Do you personally use the generic medicines instead of branded?



- 6 Is there any availability-issue of generic medicines?

More than 95 % pharmacist said there is no availability-issue.

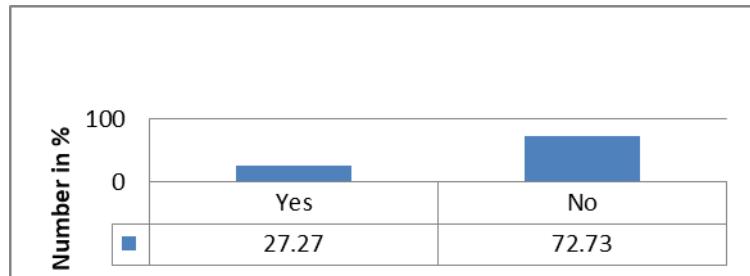
- 7 What kind of difficulties do you face about generic medicine availability or sale?

Some pharmacist said that there is no difficulty in keeping generic medicines. According to them most of the patients strictly follow prescription which mostly has branded medicines and there is very less demand of generics.

- 8 Which pharmaceutical industries make generic medicines?

Most of the pharmacists were aware that various companies deal in generics like GSK, Cipla, Ranbaxy, Lupin, FDC, Alkem, Intas, Emcure etc.

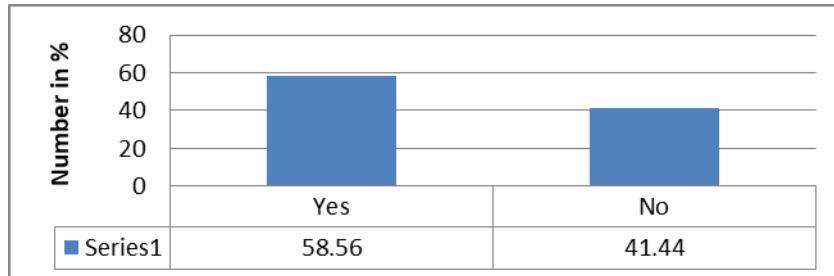
- 9 Is there any quality difference between generic and branded medicines according to you?



- 10 What are the disadvantages of generic medicines?

More than 90 % of pharmacists said that there are no disadvantages of generic medicines and few find poor quality is major disadvantage.

- 11 Government is making generic medicines available free of cost at government hospitals, do you think it will affect your business?



- 12 Why generic medicines have lesser price than branded?

Pharmacist suggested that it could be because of company policies, low investment in marketing, reputation, and quality difference and some of them were aware about the patent expiration of parent molecule.

## 20. RESULTS AND DISCUSSIONS

Survey was conducted among different groups of population. The survey result of professionals of public and private sectors shows that both the groups are quite aware about various government policies about generic drugs. Nearly 65% of individuals said that the generics are as effective as branded medicines. More than 83% individuals found a huge cost difference between generic and branded medicines. More than 55% people didn't

know such stores where generic medicines are available but when they were asked if they would like to know such store near about 95% responded positively. Such type of prediction can be inferred by above graphs.

## 21. CONCLUSION

Survey of 100 patients belonging to public sector, 100 patients belonging to private sector and 50 Pharmacist was carried out to represent scenario of generics versus branded medicine in India particularly in the Sagar city of Madhya Pradesh state. It is obvious from survey that patients from both the group would like to have access to generic medicine and want to have more knowledge and information about generic medicines. Thus it could be suggested that doctors can write generic alternative to branded medicines for the benefit of the patients as most of the individuals in survey have conclusively said that they would like to have cheaper alternative to branded medicines. There is strong belief amongst the patients of both the groups that if doctor has prescribed the branded medicines it cannot be changed and generic alternative may have less effect. India is a leading country in medicine manufacturing sector and producing cost effective and quality medicines in the entire world. In view of above it can be said that implementation of concept of Jan Aushadhi Stores and Free Drug Distribution Centre is effective step taken by the government and positive results of these policies already started benefiting the patients. In near future, we will see more benefits of these policies.

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## A study on relationship between medical tourism and hospitality industry in India with special reference to OYO

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### ABSTRACT

*Medical tourism is a very hot topic now a days because everyday 5000 people on an average from abroad come to India for the purpose of treatment or health check-up due to lower costs as compared to any other country. Medical tourism and hospitality industry shares direct relationship and that is why medical tourism in India is flourishing due to lodging options like Oyo. And this is achieved only by Oyo because it is very firm and Strong in communication with customers and provides affordable & cheaper rooms with world class amenities. In any country medical tourism will be on stronger side only if hospitality industry is strong.*

*Keywords – Hospitality industry, medical facilities, treatment seeker, travel, direct relationship, flourishing, communication, own country, abroad, food services, accommodations*

### 1. INTRODUCTION TO MEDICAL TOURISM AND HOSPITALITY INDUSTRY

Medical tourism consists of two words that is Medical and tourism which means and refers to those people who actually travels from one country to another to get treatment and medical facilities. The seeker doesn't get the treatment or medical facilities in its own country therefore it becomes essential to travel to another country or abroad. In the past the travellers or treatment seeker or the customer travels from less developed countries to major medical centres which are located in highly developed countries but now the trend has changed a little bit which means customer do travel but from developed countries to developing countries like India. The reason behind this opposite trend is that the developing country's medical treatment are cheaper.

Hospitality industry is that industry which provides food services or accommodations in places like hotels, motels, resorts, conference centres, theme parks, and amusement parks. This industry provides services of lodging, food, drink, event planning, transportation, cruise line, travelling etc. This industry mainly depends on leisure time basically known as free time. This is because of the fact that these industries were mostly successful in festival times or holiday times. However medical tourism mainly depends on the need of patient or customer because if the disease or illness or transplant is very necessary and urgent for that person then he can travel therefore medical tourism doesn't had any season or cannot be in very high demand at particular period of time. It totally depends on the customer or patient as to travel when and not at a particular time.

### 2. RELATIONSHIP BETWEEN MEDICAL TOURISM AND HOSPITALITY INDUSTRY

There is a direct relationship between Medical tourism and hospitality industry because of the fact that the patient or customer when travels from his own country to the country where he wants to get medically treated most of the times he does not travel alone but accompanied by his loved one. So on their arrival they need an accommodation or lodging options where they can stay till the time their purpose of visit got over and they also need breakfast, lunch, and dinner everyday. And this accommodation and food arrangements is hospitality. So if Medical tourism is increasing so is increasing hospitality industry.

### 3. LODGING OPTIONS

There are ample of lodging options for any tourist in India coming from any country with the needs and wants of the customer. They can get rooms, villas, bungalows or they can get cheaper rooms or five star hotel rooms with world class amenities. They can book directly or through online platforms such as yatra.com, trivago.in, goibibo.com, Makemytrip.com and the most leading online platform in India is Oyo hotel and rooms.

### 4. OYO IN INDIA

In 2012 an 18 year old boy Ritesh Agarwal from Odisha founded Oravel stays private limited. In 2013 it becomes Oyo rooms which is now India's largest hospitality industry. Ritesh Agarwal is founder and Mr. Kavikruth is appointed as Chief growth officer of Oyo to expand Oyo networks across India.

#### 4.1. Oyo special features

- i. WhatsApp update and query resolution.

- ii. Independent villas, bungalows, apartments at same prices of hotels with unique diversities like beach etc.
- iii. Kitchen.
- iv. Taking care of owner's home by Oyo staff like their own house.
- v. Providing tourists with affordable rooms with world class facilities and amenities.

## 4.2. Significance of Oyo regarding medical tourism in India

India acts as a medical hub for medical tourism in India. It provides all the Medical facilities at a very reasonable price with world class facility and Technology. And this is how Oyo works for medical tourism in India because it provides affordable and reasonable prices and very cheap prices for hotel rooms with world class facilities and amenities by providing full satisfaction to the visitor. This is how Oyo acts as a base for medical tourism in India.

## 5. OBJECTIVES OF THE STUDY

- 1. To find the relationship between medical tourism and hospitality industry in India.
- 2. To identify the reasons for success of medical tourism.
- 3. To provide with instrumental measures which acts as the reasons for success of medical tourism in India.
- 4. To know whether medical tourism is flourishing in India due to lodging options like Oyo rooms.
- 5. To know the strengths and weaknesses of medical tourism in India.
- 6. To know the opportunities and threats of medical tourism in India.
- 7. To identify the share of medical tourism in India's GDP.
- 8. To find new options in medical tourism in India.
- 9. To know the impact of medical tourism on overall Indian economy.
- 10. To understand the impact of Oyo on medical tourism in India.

## 6. RESEARCH METHODOLOGY

This research is purely based on the secondary data but the data are actually taken from the authentic sources.

### ○ Scope of study and medical tourism-

This study provides scope for improvement in medical tourism industry. However there is a lot of scope for medical tourism in India because it is more cheaper as compared to other countries which can be proved.

- High growth potential.
- Government support.
- Strategic partnerships.
- Preventive health focus.
- Stable foreign exchange rates.

### ○ Reasons for medical tourists to visit India for their treatment

- Low cost treatments as compared to other countries.
- Little or no waiting periods.
- Medical affiliations with Western hospitals with internationally recognised names.
- Competency in English language.

### ○ LIMITATIONS

This study is purely based on secondary data which is a very small and negligible limitation. Following are the limitations of medical tourism in India.

- Low accountability.
- Poor infrastructure.

- Internal price disparity.
- Medical and travel risk.

## 7. HYPOTHESIS –

### Statement of hypothesis –

**Medical tourism is flourishing in India due to lodging options like Oyo.**

## 8. FINDINGS

Medical tourism is flourishing due to Oyo rooms. And why medical tourism is flourishing due to Oyo rooms because of the following 4 aspects. And all those 4 aspects are covered by Oyo only and no other competitor or company is doing this. These 4 aspects are the base for hospitality industry also.

### ➤ Affordable and cheaper prices of rooms

Oyo is providing affordable and cheaper prices of rooms which can be proved by the statement of **Ashraf Ali who is Mumbai president of Hotel association said that “ The price of hotels which are 2000 to 2500 are now sold at 800 to 900 by Oyo.”**

### ➤ World class amenities and facilities

Oyo provides world class facilities and this can be proved with the feedback of a customer named **Ram Jhula Rishikesh, Allahbad who said “ I have booked the rooms from various hotel booking sites but first time booked the hotel through Oyo Rooms. They provided me really wonderful hotel with beautiful ambience location which was full of nature and hotel staffs were very supportive they gave me every possible information about the local area where I wanted to visit and I will going to suggest Oyo to all my friends and relatives for hotel bookings I am really impressed by your services.”**

### ➤ Customer satisfaction

Customer satisfaction is very high due to following reasons.

- Awesome locations.
- Supportive staff.

A feedback from **Sireesha Jala, Hyderabad** can prove the satisfaction of Oyo rooms who said “ Location of oyo rooms are easily accessible. The range of availability is more and it was very easy to book and check in and comfortable timings and room service at affordable prices. The Oyo rooms have become the new trend.”

### ➤ Communication Excellency

Oyo is excellent in communication with customers because the fact that they are providing watsapp updates and text message updates supported by calls also. They resolve queries in fraction of seconds.

**Oyo is actually leading in all these aspects as compared to other competitors.**

## 9. CONCLUSION AND SUGGESTIONS

### 10.1 CONCLUSION

From the above study we can conclude that medical tourism and hospitality industry shares direct relationship. Medical tourism is actually flourishing due to lodging option of OYO rooms but there is always greater scope for improvement in medical and treatment and also in the lodging options of OYO. Medical tourism can flourish in a country when there is strong pillars which are explained below.

- All required medical treatments are offered.
- Medical treatments offered must be at a lower price compared to all other countries .
- Ample sight seeing options in that country.
- Strong hospitality industry.

India is very fortunate to have all these 4 options and that is why it is on top. However there is always scope for improvement .However medical tourism also need needs to expand its scope to **herbal medicines, medical treatment, and Ayurvedic medicines** because it is not only limited to medical treatment and some tourists of Indian natives wants medical massages here but we are not such great in it. Therefore if herbal medicines,

Ayurvedic medicines and medical massages are also available with world class facilities and international recognitions then medical tourism will definitely reap awesome fruits in future.

## 10.2 SUGGESTION

1. A separate and suitable lodging option should be provided to customers who visit for medical purposes like if they want lift, wheel chair etc.
2. Medical tourists must be given extra discounts.
3. There must be a uniform grading and accommodation system for hospitals to build consumer's trust and government must act as a regulator in it .
4. The medical tourists should get visa on arrival and can create medical attaches to Indian embassies that promote health services to prospective Indian visitors.
5. To capture the attention of medical tourists aggressive Incredible India medical tourism awareness campaign should be done in international markets.
6. Indian hospitals must do tie up with foreign hospitals, insurance companies, because all those companies who want to do medical check-ups of their employees sent their employees' to India because India offers low cost treatment and also insurance companies also do the same thing this can counter competition and also gives exposure to foreign hospitals too.
7. Indian hospitals must go for international recognition which can be achieved through accreditation.

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## Indian Medical Tourism: Sun and Surgery

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### **ABSTRACT**

*Medical Tourism in India is becoming a trend now. Indian states like Kerala, Maharashtra, Gujarat, Goa etc. are preferred by numerous foreign patients for their medical treatment as well as tourism. Number of factors has made Indian Medical tourism a hot cake at global podium. The significant factors are good medical infrastructure and comparatively cheaper medical treatment; as a result this sector is growing rapidly. Currently Indian healing centres are equipped with latest technology and employs extremely experienced and qualified staff to provide quality medical treatment. The present study is an effort to find out the factors influencing directly to growth and development of Indian Medical Tourism with special emphasis to Mumbai city. Secondly the study aims to recognize the level of satisfaction of international medical tourists from hospital in Mumbai city.*

*Keywords: Medical Tourism, Indian health care industry.*

### **1. INTRODUCTION**

Medical tourism is the act of travelling out to a different country to quest for prudent Medical care and recuperation through a dedicated assistance organisation. In other words “Medical Tourism” can be described as “Delivery of ‘Cost Effective’ medical facility in association with tourism sector for international patients seeking for specialised treatment.” Medical tourism industry is a convergence of health care and tourism at private and public level. In 21<sup>st</sup> century this sector has developed as one of leading sector of tourism industry as a whole. The sector individually generates higher revenue and employment opportunities as well as increased foreign exchange. Medical Tourism in other words is known as medical travel, wellbeing tourism or worldwide therapeutic facilities and eventually it has converted into a comprehensive notion harvesting the importance.

Connell (2006) has defined it as “as an outstanding mass culture where people go to abroad countries to obtain restorative administrations organizations and workplaces, for instance, medicinal, dental and careful care while having the opportunity to visit the vacationer spots of that country”. The definitions clearly describes that medical tourism combines health care with relaxation and leisure.

Various factors influence the international patients to visit India for therapeutic facilities. The patients from European countries visit India for cost effective medical treatment, wherein patients from USA and Canada seek medical treatment from India after getting frustrated by prolonged waiting period and expensive healthcare facilities. Some of the patients chose medical tourism to combine tropical vacation with medical care. Patients from less developed countries like Bangladesh, Nepal, Maldives and Pakistan, visit India as a result of non-availability of required medical facilities. Patients from Gulf countries rummage Indian medical facilities as an economical option for their health care.

### **2. NEED OF THE STUDY**

21<sup>st</sup> century has witnessed an abrupt transformation in people’s perspective about health care. Medical Patients continually scan for advanced medical services available at lowest possible cost and added customer service in abroad countries. Eventually customised medical insurance policies have also grabbed societies’ attention to medical tourism. On the other hand, tourism companies have also started offering full-fledged medical tourism packages to the patients to go overseas n get well.

At the present time the countries like Malaysia, India and Thailand etc. are consolidating medical tourism into their economic policies. The present research is noteworthy as it focuses on chief medical issues and treatments thereon embraced by international patients during their visit period in India. Additionally it is critical to comprehend the assessments of international patients’ vis-à-vis legality and technicality of Indian medical tourism process. The research paper would be valuable to comprehend different variables which

straightforwardly influence the choice of taking Indian health care services. Furthermore it is also critical to know and understand views of international patients for policy formulation.

### 3. OBJECTIVES OF THE STUDY

1. To recognize the chief healthcare techniques preferred by international patients.
2. To identify major factors contributing to growth of medical tourism in India.
3. To apprehend views of international patients about Indian health care industry and Legal process.
4. To identify the factors directly affecting the decision making of International Patients

### 4. RESEARCH METHODOLOGY

The present study is empirical in nature and based mainly on primary data. The data was collected using survey method from 100 medical tourists and their relatives from 10 hospitals across Mumbai city. For primary data collection a structured interview schedule was used which was divided in 5 segments.

The required secondary data was collected from books, case studies, journals and other published material available on websites.

### 5. LIMITATIONS OF THE STUDY

1. The study is restricted to focus on present scenario of Medical Tourism in India.
2. The scope of study is restricted to Mumbai city only.
3. The study is mainly based reliability of primary data
4. The entire study was conducted considering views of 100 medical tourists from Mumbai city. The responses are generalised to all medical tourists seeking medical treatment in Mumbai

### 6. DATA ANALYSIS AND INTERPRETATION

- A) The first section of interview schedule contains data about demographics of the respondents. The collected demographic are summarised as follows:

Chart no. 6.1 Demographics of Respondents

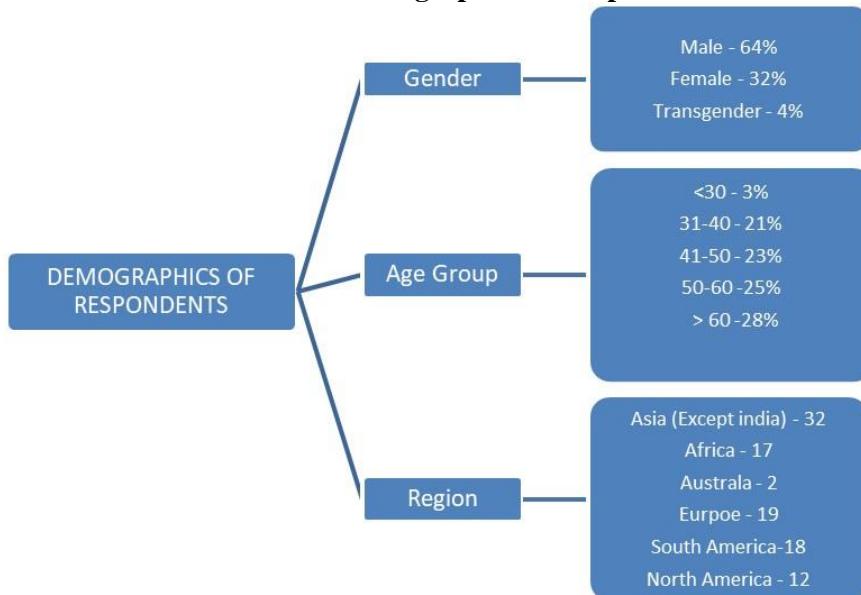


Chart No.4.1 indicates demographic features of respondents. Majority of medical tourists taking medical treatment in Mumbai are male (64%), females' accounts for a lesser proportion (32%) and transgender's account for a negligible proportion (3%). It clearly shows that females and transgender are lagging behind in terms of medical tourism.

- B) This section of interview schedule contains data about chief healthcare techniques preferred by international patients. The following chart depicts major healthcare methods opted by medical tourists in Mumbai city.

Chart No. 6.2 Healthcare Techniques preferred by Medical Tourists

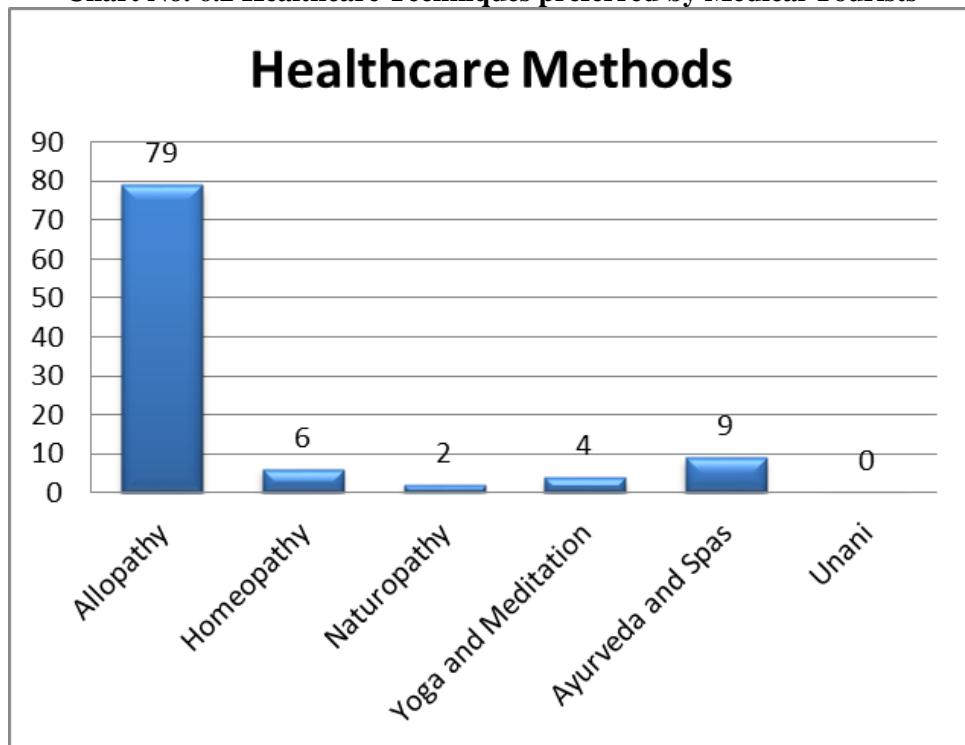


Chart No. 6.2 illustrates major healthcare methods chosen by medical tourists. It is clear from the analysis that majority of the medical tourists prefer allopathic treatments (79%) as Mumbai is a hub of Advanced Hospitals. Other techniques of healthcare opted by the tourists in Mumbai city accounts a negligible proportion. Major Hospitals in Mumbai offer a wide range of healthcare services and almost all major hospitals are NABH and JCI accredited hence preferred by foreign nationalist for their medical treatments.

C) This section of Interview schedule highlights opinions of respondents on Major Factors contributing to growth of medical tourism in India. Views of all respondents were taken by constructing Likert Scale and responses are tabulated as under:

Table No. 6.1 Major Factors Contributing to Growth of Medical Tourism in India

Influencing Factors	Highly Satisfied (%)	Satisfied (%)	Dissatisfied (%)	Highly Dissatisfied (%)
<b>Availability of advanced medical treatments at relatively lower cost</b>	81	7	11	1
<b>Availability of Good infrastructure, transportation facilities etc.</b>	67	20	11	2
<b>Availability of highly qualified and experienced doctors with past proven records in effective medical treatments</b>	69	22	5	4
<b>Suitable lodging facilities for patient's relatives</b>	72	13	8	7
<b>Adequate promotion of medical tourism by the Government</b>	48	23	18	11
<b>Availability of medical insurance at a lower cost</b>	44	29	8	19
<b>Availability of expert surgeons/ doctors in case of failure of medical treatment</b>	61	18	16	3
<b>Availability of suitable legal provision for protecting medical tourists against</b>	48	16	23	13

any kind of mislead				
Availability of post treatment medical assistance by the hospitals	57	26	13	4
Effective advertising related to medical and non-medical services through national and international media	27	31	24	18

**Table No. 6.2 Mean Score of Major Factors Contributing to Growth of Medical Tourism in India**

	N	Minimum	Maximum	Mean	Std. Deviation
Major Factors Contributing to Growth of Medical Tourism in India	100	.00	100.00	82.0353	2.90204
Valid N (list wise)	100				

*Source: Compiled SPSS Output*

As per tabulated data Mean Score of level of satisfaction towards Major factors contributing to growth of Medical tourism in India is 82.03% with a standard deviation of 2.90. The low standard deviation demonstrates that in most of the influencing the factors transmit high level of satisfactions amongst respondents while minimal factors carry dissatisfaction.

D) This section of interview schedule captures the views of Medical Tourists about Indian health care industry and Legal process involved.

**Table No. 6.3 Opinion of Medical Tourists about Indian health care industry and Legal process involved**

Opinions	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Cost of Medical Visa is higher than tourist Visa of India	9	47	2	31	11
Medical treatment cost is low but other costs are very high in India	13	41	0	33	13
Websites of hospitals provide all information pertaining to various health care treatments available in Indian hospitals	4	72	0	17	7
Indian doctors are proficient to diagnose for precise health care treatment	6	81	3	8	2
Indian hospitals' staff are skilled and efficient	3	64	7	21	5
Indian hospitals are helpful in getting medical visa and extending the medical visa, as per the health condition of patient	17	72	0	9	2
There is a minimum waiting period for health care treatment	2	36	6	53	3
India is an easily accessible country for any type of health care treatment	67	29	1	2	1

**Table No. 6.4 Mean Score of Opinion of Medical Tourists about Indian health care industry and Legal process involved**

	N	Minimum	Maximum	Mean	Std. Deviation
Opinion of Medical Tourists about Indian health care industry and Legal process involved	100	.00	100.00	86.0951	0.98027
Valid N (list wise)	100				

*Source: Compiled SPSS Output*

The mean score of tabulated data Opinion of Medical Tourists about Indian health care industry and Legal process involved is 86.09% with a standard deviation of 0.98. The low standard deviation demonstrates that views of most of the respondents are similar.

E) This is the last section of interview schedule which identifies the factors directly affecting the decision making of Medical Tourist. The collected data is tabulated as under:

**Table No. 6.5 Factors directly affecting the decision making of Medical Tourists**

Opinions	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Appropriate accreditation system for Indian hospitals	6	87	2	4	1
Availability of Online comparison regarding costs of health care treatment and non-medical facilities	19	42	11	25	3
Availability of strong medical insurance system in India	4	38	16	29	13
Availability of advanced medical technology in Indian hospitals	39	58	0	1	2
Effective government initiatives to support hospitals in improving medical tourism in India	8	27	36	22	7

**Table No. 6.6 Mean Score of Factors directly affecting the decision making of Medical Tourists**

	N	Minimum	Maximum	Mean	Std. Deviation
Factors directly affecting the decision making of Medical Tourist	100	.00	100.00	71.0621	2.53814
Valid N (list wise)	100				

*Source: Compiled SPSS Output*

The mean score of tabulated data Factors directly affecting the decision making of Medical Tourists is 71.06% with a standard deviation of 2.53. The rate of standard deviation proves that factors influencing the decision making of medical tourists differ slightly in terms of Medical insurance system in India and effective government initiatives taken by the government to support medical tourism in India.

## 7. FINDINGS

Based on primary data analysis collected from medical tourists taking medical treatment in Mumbai following observations are made:

- Majority of medical tourists opt for allopathic treatment over another forms of healthcare treatments available in Mumbai city followed by Ayurveda & Spas and Homeopathy treatments. The proportion of naturopathy and yoga & meditation is very low wherein none of the respondent has chosen Unani technique for their treatment.
- Current trend has shown that health care is the newest trend to visit India owing to the relatively cheaper advanced medical treatments along with state of the art infrastructure and highly qualified and expert medical practitioners. The other factors include comparatively lesser waiting period, favourable government policies in terms of Visa extensions and extended treatments.
- The prominent factors that influence medical tourism in India are transparency regarding cost structure of medical treatment and other non-medical facilities, use of latest technology by the hospitals, easy accessibility, proper accreditation system etc.
- Most highlighting factors prompting development and growth of medical tourism in India are availability of expert medical practitioners with high know-how and easy availability of accommodation facility for

patient's relatives. Additionally post treatment assistance is also an important determinant of growth of this sector.

- It is further observed that understanding the possibilities of high growth rate in said sector, Government of India in association with Tourism Ministry and Major corporate hospitals have moved toward with high level of professional assurance.
- On one hand major hospitals with government support are escalating in providing world class healthcare facilities to medical tourists, there exists a number of complications faced by international. The major problems are language barriers, high cost of transportation, availability of food for patients' relatives, fluctuating exchange rates, misleading by local people etc.

## 8. RECOMMENDATIONS

- There is a strong need of spreading awareness about Indian Healthcare Industry on International Platform. Ministry of Tourism along with private tourism companies and major hospitals should initiate a mechanism to promote all forms of medical methods available in India.
- Various Non-Government Organisations can come forward and train and engage their volunteers for assisting international patients and their relatives to eliminate language, food and exchange rate barriers.
- Healthcare sector should collaborate with hospitality and aviation sector for providing a comprehensive medical tourism package to seeking overseas tourists.
- Ancient Indian Healthcare methods such as Homeopathy, Ayurveda, Homeopathy, Unani and Naturopathy should be promoted to attract more and more foreign nationalist to visit India and get benefit of Traditional Indian health care treatment techniques.
- Preventive healthcare sector like Yoga, Meditation, Panchkarma also should be promoted.
- There is an urgent need of increment in exposure of Indian hospitals to international patients. Constant updates, adoption of internationally accepted standards, accreditation by National and International bodies is obligatory for such hospitals.
- Liberalisation in Visa system is much desired along with introduction of different categories of visa for promoting medical tourism in India.

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## Patients Grievance Handling Systems and Perception of Service Excellence in Hospitals

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### ABSTRACT

The research study explores that the Patient complaints regarding their inconveniences related to medical errors in hospitals while providing the treatment, patient centred care, Quality of care, effectiveness and efficiency towards the patient care. The main aim of the study is to understand their problems by conducting the survey on their grievances through questionnaire form. The data is collected from 50 respondents with different attributes. Then it is easy to evaluate problems and provide proper solutions for the patient complaints. It increases patients satisfaction, confidence and trust towards the organisation.

**Keywords:** Patient complaints, Patient safety, Patient satisfaction.

### INTRODUCTION

Same as like any other services, health care services are intangible in nature; there for convincing and getting a new patient is challenging in this competitive era so as the organizations mostly try to retain their patients in all the best possible ways. They offer to provide the best treatment by promising best doctors or experts from different parts of the world, latest medical equipment, speciality services, lab and clinics etc. Making everybody happy at times is difficult in a service organization even if your organizations are able to provide the best. Reaction of such patient towards unsatisfied services, approaches, process, and disappointment of any treatments after visiting a hospital is normally considered as grievance. Such kinds of grievance and injustice situation that is brought to the attention of management and seeks for the appropriate solution shall be taken as grievance. If organization succeeds in solving issues and make patients happy, alternatively it increases the reputation and growth of the organisation. In other words a grievance is any discontent or dissatisfaction whether expressed or not, whether valid or not arising out of anything connected with the hospitals that an patient thinks, believes or even feels, or unfair, unjust or in equitable.

### CAUSES FOR GRIEVANCES IN HOSPITALS

Hospital environment, Treatment, Supervision, Pricing, service excellence, employee and staff behaviour are few of the main reasons for grievance in hospitals. Perceived inequalities in treatment, claims for equal pay, medical insurance are the grievance arising areas related to pricing in hospitals. Unfair rules, light, space, cleanliness are considered potential areas of grievance under hospital environment. Employee attitudes and unfair partialities come under supervision and care. Issues among the internal customers also might affect the services towards external customers. Unaddressed or unsolved issues among employees, employees with patient, bystanders or other hospital visitors would create unpleasant feeling about the hospital environment; this would also leads to dissatisfaction of services.

### OBJECTIVES OF THE STUDY

The main objective of this paper is to study the effectiveness of grievances handling system in hospital by accompanying of their needs and desires through proper handling system. It helps to reduce the disappointment or discomfort towards the medical errors.

### REVIEW OF LITERATURE

Localio, A. R. (2000) his study discusses the patients expectations towards the providing treatment from the hospitals and concluded that meeting expectation is one of the challenging task for physicians through proper medical treatments.

Forman, H., & Merrick, F. (2003) conducted a study on changing the management system because of complaints and found that the valuable tools to maintain relationship with patients through understand their complaints by better communication and proper implementation of steps to avoid medical errors.

Gurwitz, J. H. (2004) concluded that maintaining the physicians and patients relationships reduces of medical errors like treatment, inappropriate nursing care towards the patients.

Stelfox, H. T et.all (2005) said that grievances occurred because of improper treatment, mismatching of reports, and wrong distribution of reports. So proper documentation and records are unavoidable which might be useful at any point of time to solve issues.

Hsieh, S. Y. (2010) concluded from his study that patients' grievances shall be avoided to an extent by maintaining proper feedback system collected from patients about improving quality of services to patients.

Levin, C. M., & Hopkins, J. (2014), implies from his study that the resolution process for complaints feedback form is the best process to their hospital services but it is one of the challenging risk for organisation once they improved this process it increases the growth of the organisation.

Reader, T. W., Gillespie, A., & Roberts, J. (2014) discussed and concluded that the patients' grievances are more when hospitals dealing with wrong treatments which lead to patient dissatisfaction and patients' safety by the implementation of code taxonomy.

Harrison, R., Walton (2016) stated from his research that following factors like treatment, clinical examination, faulty diagnosis, medical errors and nursing care influence a rise in grievances in hospitals.

Marang-van de Mheen, P. J. (2018) concluded that technological advancements and implementation in hospitals shall reduce wrong diagnose and will help to offer the advanced treatment to patients which might reduce grievance and shall gain their satisfaction and trust towards the hospital.

Ryynänen, S. P., & Harisalo, R. (2018) conducted a study on the patients grievances related to improper management services provided by the hospital and found that increase in miscommunication between physicians and patients leads to failure in interpersonal relationship with patients and family members which leads to grievances.

## RESEARCH METHODOLOGY

### Research Design

A quantitative research approach with is implemented in for this research, and sources of information that is used in this research is primary data. Sample population is randomly selected; therefore 50 respondents have been made involved in this survey through convenient sampling method. Well-structured questionnaire with 32 statements into 2 categories is used to collect information form patients. Frequency analysis and Mean analysis is used as statistical tool to analyse the data. As the mean implies average and it is the sum of data divided by the number of data; it also proved to be an effective tool when comparing different sets of data, the researcher had used mean analysis for analyse the data.

## ANALYSIS AND INTERPRETATION

### MEAN ANALYSIS OF HOSPITALS SERVICES

**Table 1: Mean analysis of Hospital Services**

s.no	HOSPITAL SERVICES	Mean	Rank
1	Hospital environment	4.00	4
2	Nursing services	4.24	2
3	Doctors services	4.60	1
4	Diagnostic services	4.02	3

Table no 1 shows the Mean Analysis of Hospital services and it's clear from the table that highest mean value is for Doctors services (4.60) which ranked one, followed by Nursing services (4.24) ranked two, Diagnostic services (4.02) ranked three and Hospital environment (4) ranked four. This clearly says that doctor services are considered as the most important factor in a heath care service. Patients' satisfaction level shall be increased if the hospital can offer the best doctor who would serve better.

### MEAN ANALYSIS OF EXPERIENCE WITH THE STAFF

**Table 2: Mean analysis of Experience with staff**

s.no	Experience with the staff	mean	rank
1	Staff communication with patient/by stander	4.22	1
2	Staff courteousness & politeness	3.95	4
3	Approaches of employees while admitting the patient	4.18	2
4	About nurses follow up care	3.96	3

## Interpretation

Table No 2 shows the Mean Analysis of Experience with the staff and it can be found that the highest mean value is for 'staff communication with the patient/by stander' (4.22) and it ranked No 1, followed by approaches of employees while admitting patient (4.18) scores 2<sup>nd</sup> rank, Nurses follow up and care (3.96) scores 3<sup>rd</sup> rank. This proves that the patient happy with the way employees communicate with patient. They strongly believe that it develops relationship between patients and management.

## MEAN ANALYSIS OF DURATION OF TIME:

**Table-3: Mean Analysis of duration of time for different attributes**

s.no	Duration of time	Mean	Rank
1	Treatment process	4.01	1
2	Time taken for admission process	3.52	2
3	Time taken for food delivery	3.26	3
4	Time taken for discharge process	2.98	4

## Interpretation

Table No 3 shows the Mean Analysis of duration of time for different attributes. It is clear from the table that the highest Mean value is for 'treatment process' (4.01) and it ranked No 1 among the other. This shows that patients support is much stronger and it takes a part of treatment process.

## MEAN ANALYSIS OF ASSESSMENT LEVEL OF GRIEVANCES HANDLING:

**Table-4: Mean Analysis of assessment level of grievances**

s.no	Assessment level of grievances handling	Mean	Rank
1	Staff apologies for the inconveniences	3.94	6
2	Management is dealing grievances effectively	4.06	5
3	Issues are not repeating	4.26	4
4	Proper solutions are found for the complaints	4.32	3
5	Special attention is given to all patients	4.4	2
6	Satisfied with existing grievance handling practices	4.72	1

## Interpretation

From the Mean Analysis of Assessment level of grievances handling, it is clear that the highest Mean value is for 'I am satisfied with the existing grievance handling practices' (4.72) and it ranked No 1 among other. This indicates that patients feel very much satisfied with the grievances handling mechanism in the hospital. They also feel that they are very strong and vigorous on their treatment, diagnostic procedures, and investigations. Without patients cooperation these would not happen thus it is proved that staff also well engaged to understand the patient grievances and doing their work with commitment by satisfying the patients.

## FINDINGS

It is found that 60% of respondents of this study are male. Average age category of respondents is 27 years and many are qualified with under graduation. Most of the respondents (38.6%) are having 3-5 years of experience with monthly salary of INR 10,000 to 30,000.

It is found that doctor services are considered as the most important factor in a health care service. Patients' satisfaction level shall be increased if the hospital can offer the best doctor who would serve better. It also proves that the patients are happy with the way employees communicate with them. They strongly believe that it develops relationship between patients and management. It is also found that patients support is much stronger and it takes a part of treatment process. It is clear that patients are very much satisfied with the grievances handling mechanism. They also feel that they are very strong and vigorous on their treatment, diagnostic procedures, and investigations.

## CONCLUSION

Grievance handling is major challenges in hospitals since the expectation of patients are increasing with changing their attitude towards the patients treatment. It is challenging to satisfy all the customers of a service but as far as healthcare concerned, expectation place wild role. These expectations shall be satisfied through proper communication, excellent treatment, doctor patience relationship, etc. The most important is addressing their issues and resolving it. It can generalise that patients are satisfied with the treatment, recovering the

patient health as soon as possible & safety facilities provided by the hospital. Hospital is giving benefits as per the various enhancement of medical services but there is still scope of improvement, which will benefit for the both hospital reputation & patients satisfaction level.

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## Global Evolution of Artificial Intelligence (AI) in Health Care Market

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*"The flashiest use of medical AI is to do things that human providers even excellent ones cannot yet do."*

### ABSTRACT

In recent years, there has been a louden focus on the use of Artificial Intelligence (AI) in various domains to resolve complex issues. Likewise, the adoption of artificial intelligence in healthcare is growing while radically changing the face of healthcare delivery. AI approaches to sense and comprehend data, and in health care it determines the ability to gain more informations, process the same and give a well-defined output to the last end-user.

*Keywords:* Artificial Intelligence, healthcare market, Industry.

### 1. INTRODUCTION

In recent years there has been an immense amount of discussion, about the advent of artificial intelligence (AI) and the implication of its application in various domains. However, the concept of AI is not new and can be traced back to Ramon Llull's theory of a reasoning machine in 1300 CE. The global artificial intelligence in healthcare market size was valued at USD 2.5 billion in 2018 and is anticipated to grow at a CARG of 41.5% over the forecast period. Increasing number of cross-industry partnerships is expected to boost adoption of AI in the healthcare sector, which is also responsible for its lucrative growth rate.

Artificial Intelligence (AI) is the ability for computer algorithms to approximate conclusions without direct human input. It is a useful machine learning especially in healthcare. The use of algorithms and software to imitate human awareness in the analysis of medical data, relates to AI in health care. In AI technology in health care determines the ability to gain more informations, process the same and give a well-defined output to the last end-user. AI does this through machine learning algorithms. In this way it is distinguished from traditional technologies in health care.

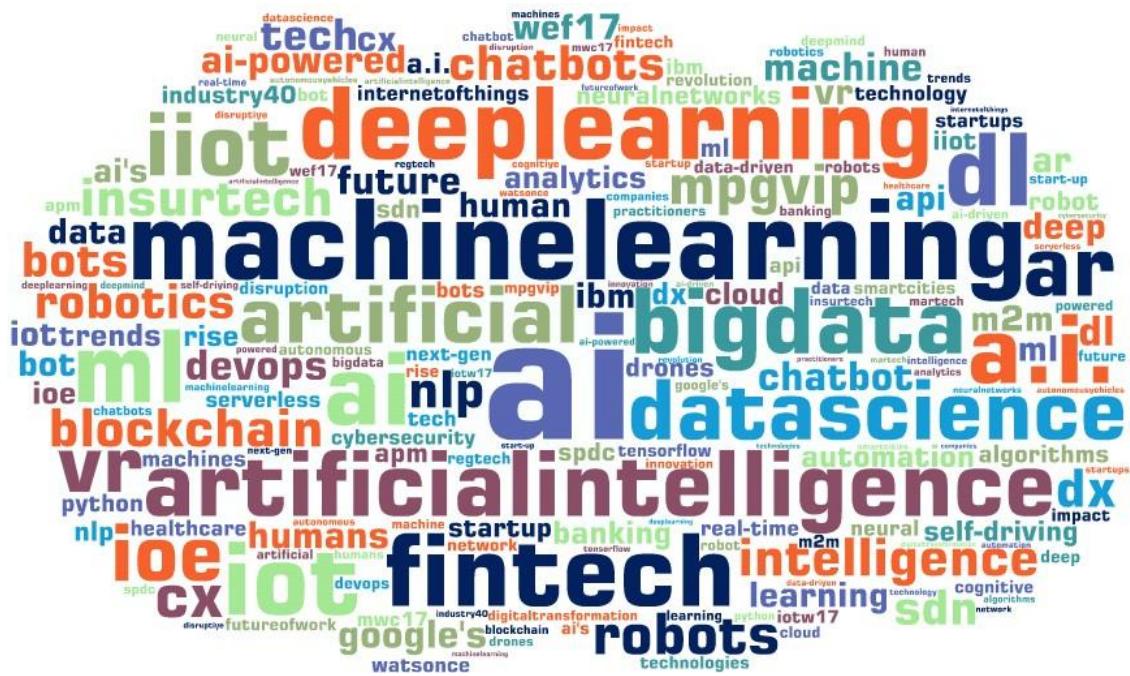
AI algorithms need to be tested repeatedly, in order to reduce the margin of error. It is different from humans in two ways: (i) If you set a goal, the algorithm can't adjust itself and only understand what is has been told explicitly, (ii) and algorithms are black boxes, it can predict extremely precise, but not the cause of the why. The basic primary aim of health-related AI applications is to analyze relationships between prevention or treatment techniques and patient outcomes. Some are in practices such as personalized medicine, patient monitoring and care, treatment protocol development and drug development.

### 1.1. HISTORY

In 1960s and 1970s the first problem-solving program, or expert system, known as Dendral was produced. It was mainly designed for applications in organic chemistry. It provided the basis for a subsequent system MYCIN, considered one of the most significant early uses of artificial intelligence in medicine. In 1980s there was a recognition that AI systems in healthcare must be designed to accommodate the absence of perfect data and build on the expertise of physicians. Medical institutions such as The Mayo Clinic, Memorial Sloan Kettering Cancer center and National Health Service have developed AI algorithms for their departments. Companies like IBM, Google, Welltok and Ayasdi have also developed AI algorithms for healthcare.

Over the half-century period that have enabled the growth healthcare-related applications of AI in Medical and technological advancements include:

- Growth of genomic sequencing databases.
- Enabling machines to replicate human perceptual processes.
- Enhanced the precision of robot-assisted surgery.
- Implementation of electronic health record systems.



## **NEED FOR THE STUDY**

The main aim of this study is about the Artificial intelligence. Since AI in health care in current scenario has become vital. Artificial Intelligence in various fields has improved in analyzing treatment techniques.

## **OBJECTIVE OF THE STUDY**

The basic objective is to study about the global scenario of Artificial Intelligence (AI) in health care market. And to know about various field that gained the growth of AI. To study about the current research, risk and challenges of AI. And also to know about the large companies that have contributed to AI algorithms for use of healthcare.

## DEFINITION

A formal definition of AI would read as "*a field of science concerned with the computational understanding of what is commonly called intelligent behaviour, and with the creation of intelligent agents that exhibit such behaviour.*"

## 2. CURRENT RESEARCH

In Current scenario some various specialties in medicine have shown an increase in research regarding AI.

## 2.1. Radiology

A study at Stanford created an algorithm that could detect pneumonia at that specific site, in those patients involved, with a better average F1 metric than the radiologists involved in that trial.

## 2.2. Imaging

It is detected that skin cancer could be detected more accurately by an artificial intelligence system than by an dermatologists. A study reveals that dermatologists, detected 86.6% of skin cancers from the images, compared to 95% for the CNN machines.

### 2.3. Disease Diagnosis

The most notorious diseases such as Diabetes, and Cardiovascular Disease

(CVD) which are both in the top ten causes of death world wide have been the basis, to coordinate various methods in helping get accurate diagnosis.

## 2.4. Telehealth

Telehealth is the increase of Telemedicine, has shown the rise of possible AI applications. It helps to monitor patients using Artificial intelligence may allow for the give the information to physicians the disease activity may have occurred.

## 2.5. EHR

Electronic Health Record (EHR) developers are now automating much of the process. They are crucial to the digitalization and information spread of the healthcare industry.

## 3. INDUSTRY

More number of health data may allow for more implementation of AI algorithms. Major part of the industries mainly focus of implementation of AI in the healthcare sector is in the clinical decision support systems. The following are examples of large companies that have contributed to AI algorithms for use of healthcare.

### 3.1. IBM

IBM with CVS Health is working, on AI applications in Chronic disease treatment. And working with Johnson & Johnson on analysis of scientific papers to find new connections for drug development. Watson Oncology is also in the development Memorial Sloan Kettering Cancer Center and Cleveland Clinic.

### 3.2. Microsoft

Hanover project, of Microsoft together with the partnership with Oregon Health & Science University's Knight Cancer Institute, analyzes medical research to find out the most effective cancer drug treatment options for patients.

### 3.3. Google

DeepMind platform is being used by the UK National Health Service in order to find out certain health risks through data collected via a mobile app.

### 3.4. Intel

Venture capital arm Intel capital also invested in startup Lumiata which used AI to identify at-risk patients and develop care options.

### 3.5. Startups

Kheiron Medical, developed a deep learning software to detect breast cancers in mammograms. And another Medevice, provides real time medical advice to clients, who can access and store their Electronic Health Records (EHRs) over a decentralized blockchain. It used machine learning aided decision making to help physicians predict medical red flags (i.e., medical emergencies which requires clinical assistance) before serving them.

### 3.6. Other

Digital consultant apps like Babylon Health's GP at Hand, Ada Health and Your MD use AI to give medical consultation based on personal medical history and common medical knowledge.

## 4. EXPANDING CARE TO DEVELOPING NATIONS

AI as it is able to interpret radiology, it may be able to diagnose more people with the need for less doctors as there is a shortage in many of these nations.

The goal of AI is to teach others in the world, which will then lead to improved treatment, and eventually greater global health. Using AI in developing nations who do not have the resources will diminish the need for outsourcing and can use AI to improve patient care. Like Natural language processing, and machine learning are being used for guiding cancer treatments in places such as Thailand, China and India.

## 5. SOME OF THE REGULATION

No specific regulations exist especially for the use of AI in healthcare. In May 2016 the White House announced its plan to host a series of workshops and formation of the National Science and Technology Council (NSTC) Subcommitte on Machine Learning and Artificial Intelligence. In October 2016 the group announced about that The National Artificial Intelligence Research and Development Strategic Plan, outlining its proposed priorities for Federally-funded AI Research and development. And ITU- WHO Focus Group on AI for Health has built a good platform for the testing and also benchmarking of Artificial Intelligence applications in health domain.

## 6. RISK AND REMEDIES FOR AI IN HEALTH CARE

As developers create, Artificial Intelligence (AI) systems to take on the task several risks and challenges emerge. Including the risk of injuries to patients from AI system errors, the risk to patient privacy of data acquisition and AI inference, and more.

## 6.1. Potential Benefits

Although the field is quite young. It has four major roles in the health care systems

- Pushing the boundaries of human performance.
- Democratizing medical knowledge and excellence.
- Automating drudgery in medical practice.
- Managing patients and medical resources.

## 6.2. Risk and Challenges

AI offers a number of possible benefits, there are also several risks:

- Injuries and error.
- Data availability
- Privacy concerns
- Bias and inequality

## 7. CONCLUSION

AI in Healthcare delivery till now has years become complex and challenging. Major part of the complexity in delivering healthcare is because of the voluminous data is generated in the process of healthcare, which has to be interpreted in an intelligent fashion. However, cold technology cannot totally replace the human elements in patient care.

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## A Study to assess Nursing Preparedness about Health Informatics and use of Electronic Communication Media, Electronic Health Record and Mobile Application in Nursing at selected hospital of Metropolitan City.”

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### ABSTRACT

*Introduction: In midst of revolutionary changes, there is a need for health care systems to transit from paper-based data management to electronic based data management. Objectives: The objectives of the study were to assess the knowledge of staff nurses regarding Health Information Technology and find out their preparedness in relation to Electronic Communication Media, Electronic Health Record and Mobile Application in nursing. Method and material: methodology included a descriptive evaluatory survey of 60 Registered Staff Nurses in ICU and ward in Nanavati super-speciality hospital. Tool: Closed ended questionnaire. Results & findings: The data was assessed through descriptive analysis. Study findings showed that 86% nurses had knowledge related to HER, 90% felt IT as beneficial for better patient outcome and 88% felt it useful for research and quality. Majority (70%) of the nurses agreed that health informatics would save nursing time and they are prepared for its utilization in day to day working. 95% nurses expressed health informatics would be easy and helpful and 89% nurses felt it as Innovative & systematic in working for patient care. Conclusion: Understanding how the nursing staff feel about nursing informatics in the workplace and the role technology can play in practice enables the implementation team to structure communications, reframe misconceptions, and offer possible new perceptions. Implications: The use of mobile devices by health care professionals as a media in health informatics will transform many aspects, like, information and time management; health record maintenance and access; communications and consulting; reference and information gathering; patient management and monitoring; clinical decision-making; and medical education / training.*

**Keywords:** *Health informatics, Electronic Communication Media, Electronic Health Record, Mobile Applications, nursing preparedness*

### NURSING PREPAREDNESS ABOUT HEALTH INFORMATICS

#### INTRODUCTION

Nursing is in the midst of revolutionary changes, where there is a need to get the most productivity out of scarce resources. There is a need for all health care systems to transit from paper-based data management to electronic based data management. These trends are influencing this transition from paper-based to electronic or computer-based documentation systems. The use of mobile devices by health care professionals (HCPs) has transformed many aspects of clinical practice by numerous apps to assist HCPs with tasks, such as: information and time management; health record maintenance; communications and consulting; reference and information gathering; patient management and monitoring; clinical decision-making; and medical education and training. Information and communication technologies (ICTs) help in quality health care delivery by nurses, to plan, provide, document, and review clinical care.

#### NEED OF THE STUDY

In the current competitive healthcare industry, nurses are expected to use technology with competence on a daily basis. In order to guarantee a successful implementation of a computer system while managing patient care it is important to integrate nurses' perceptions, beliefs, and knowledge in the use of new technology into their daily nursing practice. Finding the right balance of information science in conjunction with nursing science is a continuing process that will rely on the forward thinking and perseverance of today's modern nurse

and the support of nursing informatics specialists. Technology allows nurses to enter the world of the patient in ways that broaden knowledge of the patient. Therefore, competent use of technology enhances nursing. Hence, we would like to conduct this survey to know the perspective of nurses in relation to Health Information Technology.

## STATEMENT OF THE STUDY

A Study to assess Nursing Preparedness about Health informatics and use of Electronic Communication Media, Electronic Health Record and Mobile Application in nursing, at selected hospital in metropolitan city.”

## OBJECTIVES

1. To assess the knowledge of staff nurses' regarding Health informatics
2. To find out the preparedness of staff nurses in relation to use of Electronic Communication Media, Electronic Health Record and Mobile Application in nursing.

## METHODS AND PROCEDURES

A descriptive evaluatory approach was used in this study. The design selected was descriptive Survey design. The Population of the study included registered Staff Nurses. The Sample selected from the population of nurses were 60 Staff nurses from ICU and wards of Nanavati Superspeciality hospital. Non-Probability Convenient Sampling Technique was adopted. A Questionnaire and Opinionnaire was distributed among the staff nurses and response was collected in 15 minutes. Data analysis was done with descriptive Statistics. Comparison of knowledge level was done between ICU nurses and ward nurse though mean score.

## FINDINGS AND INTERPRETATION

The tool was divided into following parts and the analysis was done based on the frequency percentage. **PART I- Health IT & Communication**, **PART II- Health It & Electronic Health Records (EHR)**, **PART III- Health IT & Mobile Application**. Tool included questionnaire to evaluate the knowledge and opinionnaire to assess the usefulness and preparedness.

PART I- HEALTH IT & COMMUNICATION					
IT Saving Nursing time (%)		IT is helpful and easy (%)		IT is Innovative & systematic (%)	
YES	NO	YES	NO	YES	NO
70	30	95	5	89	11

Table I. Distribution of opinion score of subjects, related to Health IT and Communication

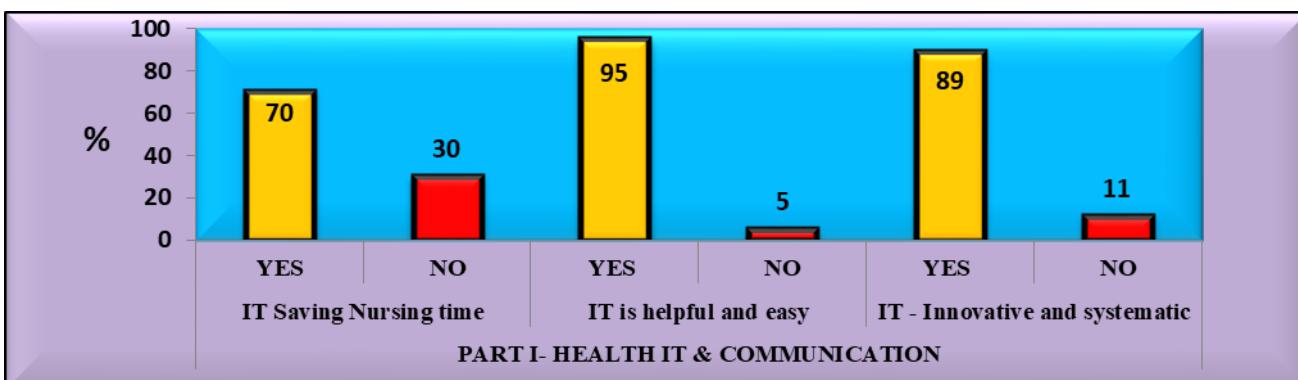


Fig-1: Distribution of opinion score of subjects, related to Health IT and Communication

PART II- HEALTH IT & ELECTRONIC HEALTH RECORDS (EHR)					
Knowledge about EHR (%)		EHR - Beneficial for better patient outcome (%)		EHR-Useful in Quality and Research (%)	
YES	NO	YES	NO	YES	NO
86	14	90	10	88	12

Table2. Distribution of knowledge score of subjects, related to Health IT & Electronic Health Records (EHR)

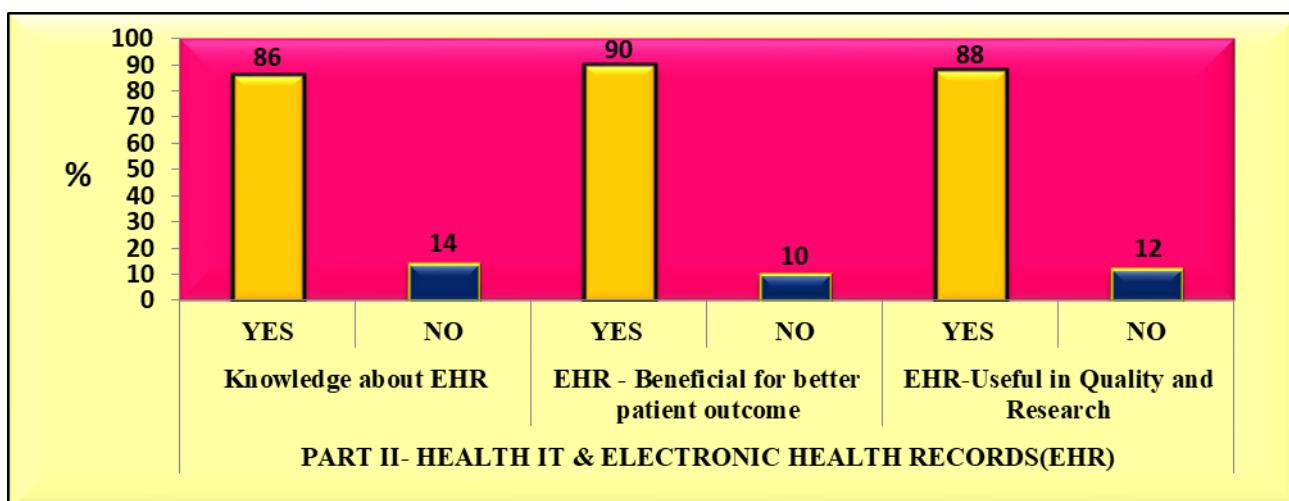


Fig-2: Distribution of knowledge score of subjects, related to Health IT & Electronic Health Records (EHR)

PART III- HEALTH IT & MOBILE APPLICATION					
Knowledge about Mobile applications in nursing (%)		Mobile applications-increasing productivity (%)		Mobile applications in reducing errors (%)	
YES	NO	YES	NO	YES	NO
89	11	84	16	97	3

Table-3: Distribution of knowledge score of subjects, related to Health IT & Mobile application

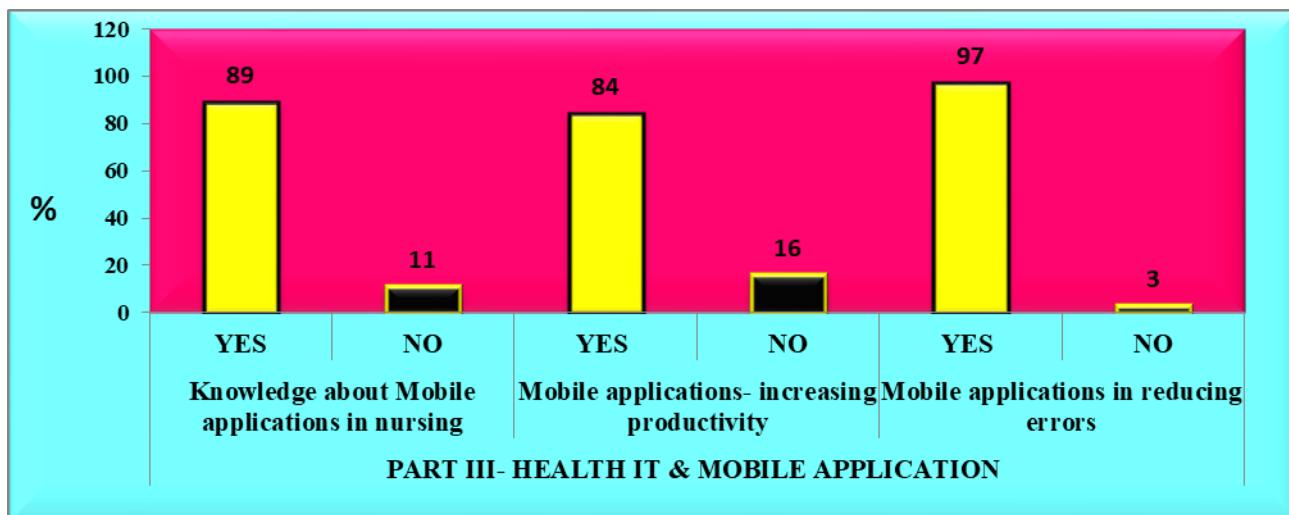


Fig-3: Distribution of knowledge score of subjects, related to Health IT & Mobile application

## INTERPRETATION

### PART I- HEALTH IT & COMMUNICATION

- Majority (70%) of the nurses felt that IT in nursing will save nursing time
- 95% nurses expressed Nursing IT would be easy and helpful and 89% nurses felt health IT as Innovative & systematic in working for patient care

### PART II- HEALTH IT & ELECTRONIC HEALTH RECORDS (EHR)

- 86% nurses had knowledge related to EHR
- 90% felt IT as beneficial for better patient outcome and 88% felt it useful for research and quality

### PART III- HEALTH IT & MOBILE APPLICATION

- 89% had knowledge about mobile applications in nursing
- 84% nurses said it would increase productivity and 97% agreed to mobile application as useful in reducing errors.

## RECOMMENDATION

1. Similar study can be conducted using selected parameters of technology
2. Further study to evaluate whether EHR, electronic communication media and mobile applications are useful in nursing
3. Studies can be done to evaluate the conservation of nursing time for patient care activity using technology in nursing
4. Similar comparative studies using more samples to help generalization
5. Such studies could be carried on to seek its importance in Nursing service, Nursing education and Nursing Research

## CONCLUSION

A pre-implementation survey of nurses' experience and attitudes about the information technology is one method of facilitating successful outcomes. Understanding how the nursing staff feel about nursing informatics in the workplace and the role technology can play in practice enables the implementation team to structure communications, reframe misconceptions, and offer possible new perceptions. Staff education can then be developed and provided based on the survey results.

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## Smart Air Mattress: A Prevention to Pressure Ulcers

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### ABSTRACT

*In today's scenario of aging population issues concerning elderly care needs serious attention. The pressure ulcer or decubitus ulcer is a condition caused by pressure applied to the body surface for a certain period, resulting in blood flow insufficiency. To prevent pressure ulcers, it is necessary to change the patient body position at regular intervals, to prevent continuous pressure on the bed to the body surface. However, the physical burden of the caregivers is increasing to fully implement this patient-repositioning due to various reasons like aging of the caregivers, busy schedule of the younger generation etc. This paper is proposing a method to lower the occurrence of pressure ulcers (bed sores) in bedridden patients. Smart Air mattress features support zones on each side of the mattress which is independently controlled by pressure sensor support. The mattress can automatically make pressure and positional adjustments to avert patient injury and discomfort. An FSR sensor senses the pressure data which is being processed by an ATMega 328pu to inflate or deflate an air mattress. The air flow is controlled by solenoid valve using an air pump*

**Keywords:** Air mattress, Decubitus ulcer, bed sore, Smart bed, FSR sensor, ATMega 328pu, air pump, solenoid valve

### INTRODUCTION (HEADING 1)

Patients with severe physical limitations, such as patients with long-term care immobilized by spinal cord injury, or those patients suffering from back problems would benefit greatly from this pressure-redistribution support-surface technology [1]. A smart bed must be capable of redistributing the forces on a patient's body so that the total off-loading of the forces on all areas of the body at different times can be accomplished [2]. Body pressure dispersion mattresses are helpful tools for preventing pressure ulcers. There are presently 2 forms of body pressure dispersion mattress: water surface mattresses, that are composed of materials like urethane foam and active support surface mattresses, which use a combination of the various air cells [3]. To perpetually relieve the body pressure, these standard water surface mattresses use a system with water chambers that ceaselessly move in an exceedingly wave-like motion, giving varied discomfort, sort of a seasick-feeling. Other downsides are that these mattresses make it difficult to perform rehabilitation practice on the mattress due to their softness [4]. Delayed mobilization and rehabilitation may increase the risk of further developing disuse syndrome or new pressure ulcers [5].

Most people dedicate from 5 to 9 hours for sleeping every day. Some studies show that the duration and quality of sleep are related to health outcomes [8]. Thus the basic function of a mattress is to keep a comfortable condition for the patient in the bed, as well as to provide an adequate environment in performing appropriate rehabilitation and nursing. Besides, we have to give a sense of relief to caregivers by reducing their physical and mental burden. To achieve such a nursing care environment, we have been working on the scientific development of a new kind of mattress which has built-in pressure sensors with a constant feedback system by automatically adjusting the mattress tension to fit the body posture of a patient.

The smart air mattress is designed especially for those patients suffering from ulcer diseases and for bed bounded patients. These pressure relief mattresses are designed in a way to relieve pressure from a patient's body to provide extra comfort [9]. Further, these mattresses are highly used in hospitals and for homecare treatment of bed bounded patients. Such a mattress is highly used in the care & treatment of patients who are unable to change their position such as obese patients. Moreover, the demand for pressure relief mattresses is expected to rise during the forecast period owing to the increasing number of bed-bound patients all over the globe [10]. Further, the growing enhancement of health care infrastructure in emerging countries is a key driver to the growth of the global pressure relief mattress. Additionally, growing technological advancements with pressure relief mattress and their growing demand from hospitals are anticipated to escalate the growth of the global market during the forecast period.

## METHODOLOGY

Bed sores are one of the leading causes of open wounds in bed-ridden patients, especially those in nursing homes. Also called pressure ulcers, they're brought about by constant pressure on the skin, particularly on the back, elbows, ankles, heels, hips, buttocks, shoulders and head [1].

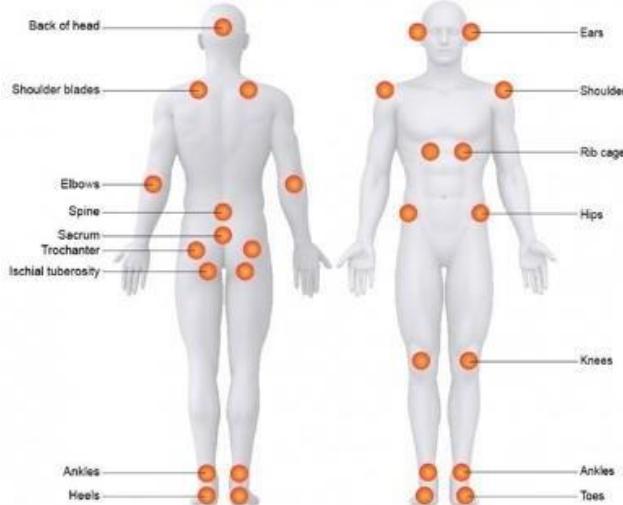


Figure 1: Pressure wounds and ulcer points

The smart bed will sense the pressure and detect sleeping posture disorder or bed sores by adjusting the mattress [10]. The mattress is specially designed to refrain the patient's muscle from long-term fixed pressure at same position for preventing bed sores. It is designed for use at home, nursing homes and hospitals for medical use.

### Components needed

- FSR sensor
- Solenoid Air Valve
- 4- channel relay module
- PVC oxford rubber sheet with cloth cover
- Air pump

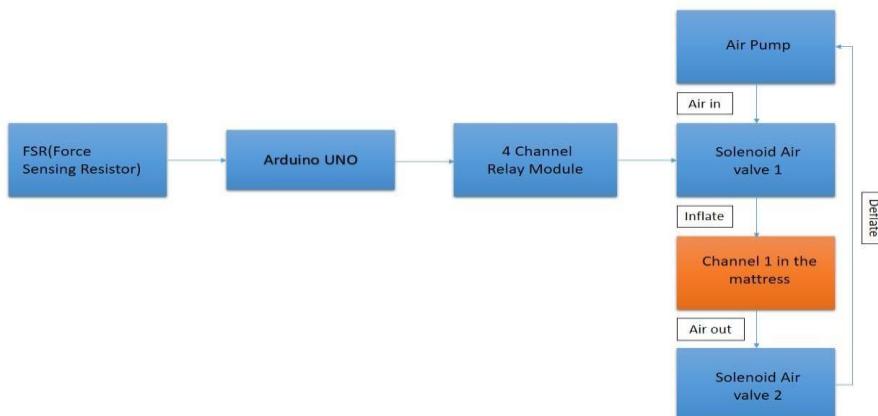


Figure 2: Block diagram of Smart Air mattress

### PRESSURE IDENTIFICATION

Smart Air Mattress is mainly Implemented to identify the amount of pressure subjected by the body to the mattress. The Smart Air Mattress detects the pressure points with changing positions and sleep patterns [4]. The device is specially designed to abstain the patient's muscle from long-term fixed pressure at the same position for preventing bedsore.

## FSR SENSOR

Force sensing resistors (FSRs), are robust polymer thick film devices that exhibit a change in its electrical resistance when a force is applied on to its surface. The FSR is typically made out of a restrictive polymer thick film ink screen, printed on a polyester film [9]. The sensing film of the FSR comprises of both electrically conducting and non-conducting particles dissolved in a matrix. The particles are of sub-micrometer sizes and are formulated to decrease temperature dependence and improve durability. Applying a force to the sensing film of the FSR causes particles to have an encounter with the conducting electrodes, in-turn decreasing its resistance [9].

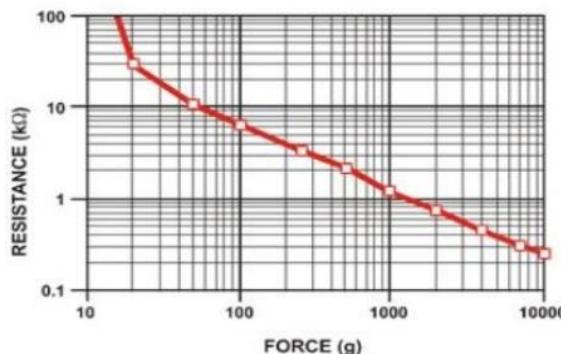


Figure 3: Variation of resistance (ohm) with force applied on the FSR

When there is no force applied on the FSR, the resistance of the FSR is very high, of the order of hundreds of  $M\Omega$ , however, when force is applied on it, its resistance reduces significantly. Unique properties of the FSR such as the requirement of small surface area for activation, low cost, flexibility and high tolerance to temperature, chemicals, and moisture make it an ideal sensor element for biomedical applications, wherein force measurement is expected [9].

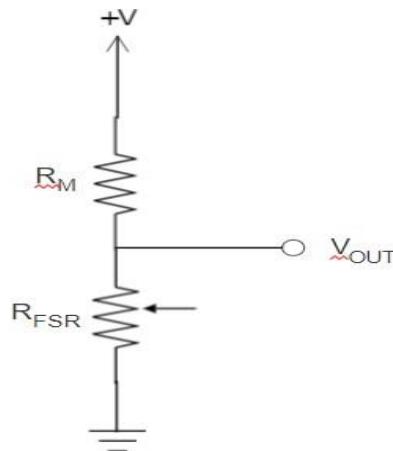


Figure 4: Signal Conversion Circuit

The above figure shows a circuit diagram for achieving a conversion of change in resistance to change in voltage [9]. In Fig 2, since the operational amplifier here is connected to an Analog Voltage Buffer Configuration,

$$V_{OUT} = V_+ \frac{R_{FSR}}{R_{FSR} + R_M}$$

Thus, as the force on the FSR increases the resistance of the FSR decreases and since  $V_+$  and  $R_M$  are kept consistent, the output voltage  $V_{OUT}$  increases. The variation of  $V_{OUT}$  with FSR is non-linear, and can be approximated as a linear variation for values of  $FSR \ll R_M$ . In the circuit in Fig. 2, the Voltage  $V_+$  and Resistance  $R_M$  are used to adjust the value of the output voltage within the desired range for ease of signal conditioning, hence used to calibrate the output voltage [9].

## VALVE REGULATION

A solenoid valve is a control unit which, when electrically energized or de-energized, either closed or allowed air flow. The actuator takes the form of an electromagnet. When energized, a magnetic field develops a plunger or rotated armature against the action of a spring. When de-energized, the plunger or rotated armature is returned to its original position by the spring action.

First, the sensor senses the pressure exerted on the body which might lead to a bed sore. When it senses that a certain amount of pressure is being applied upon it by the body, the resistance value at the output of the sensor changes which makes the arduino to switch on the relay which is further connected to the solenoid valve. Due to this, the valve gets energized and the magnetic field is generated which triggers the movement of the plunger against the action of the spring. Due to this, the plunger moves in upwards direction, which allows the opening of the orifice. At this time, the flow of the air is allowed from the inlet port to the outlet port.

If the current passing through the solenoid valve is constant, the position of the plunger and hence the opening of the orifice remains constant. Constant amount of current is passed to the air valve till the channel of the mattress gets filled with the desired amount of air in it with the help of a timer, which creates a more magnetic field and more upwards motion of the plunger. This causes a further opening of the orifice and more flow of the air from the inlet port to the outlet. If the required flow of air is less, the sensor allows passage of the lesser current to the valve.

When the air channel is filled to the desired value, the relay switches and stops the flow of the current to the solenoid valve entirely. Due to this, the solenoid valve gets de-energized and the plunger arrives at the bottom-most position and closes the orifice entirely thus stopping the flow of fluid from the inlet port to the exit port.

In this way, the solenoid coil operates the valve as if it is being operated by the individual. When the flow of a certain quantity of air is required it opens the valve to the required extent and when the flow is not required it closes the valve entirely.

## RELAY

The relay module is an electrically operated switch that allows you to turn on or off a circuit using voltage and/or current much higher than a microcontroller could handle. There is no connection between the low voltage circuit operated by the microcontroller and the high power circuit. The relay protects each circuit from each other.

Each channel in the module has three links named NC, COM, and NO. Depending on the input signal trigger mode, the jumper top can be set at a high-level operative mode which ‘closes’ the normally open (NO) switch at high-level input and at low-level effective mode which performs the same but at low-level input.

From the picture below, you can see that when the signal port is at a low level, the signal light will light up and the opto-coupler will conduct, and then the transistor will conduct, the relay coil will be charged, and the normally open contact of the relay will be closed. When the signal port is at a high level, the normally closed contact of the relay will be closed. So you can connect and disconnect the load by managing the level of the control signal port.

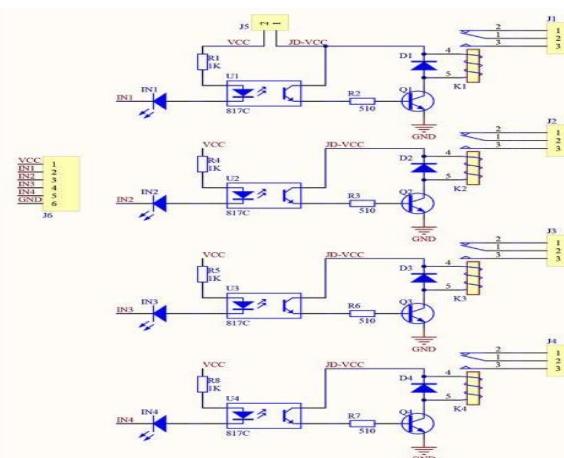


Figure 4: Pin Diagram for a 4 Channel Relay Module

## AIR PUMP

Electric air pumps operate by electrical power which is used to create a vacuum suction inside the pump so that air in the atmosphere is sucked in. The air is compressed and forced into the required chamber such as balloons, tires, aerators, etc. The electrical power can be provided by the direct electrical power supply or DC power supply with the batteries.

These pumps are fitted with the pressure gauges and automatic on/off switches. The pressure gauge helps us to determine the pressure in the chamber and gives the feedback signal to the controller. Once attaining the required pressure condition, the feedback signal turns off the air pump through a controller.

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## Diabetic Retinopathy Detection Using Non-Mydriatic Fundus Images

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### ABSTRACT

In recent years diabetic retinal disease, also known as Diabetic Retinopathy (DR), has become a new global challenge in the area of ophthalmology. It is the injury caused to the blood vessels in retina due to complications of diabetes mellitus, which can develop complete blindness if it progress to proliferative level. Hence there is a need to detect this condition as early as possible, more specifically in rural areas where there are limited resources for timely screening. Fundus images, obtained from fundus camera, have gained interest in this background as they serve a key role in detection of DR with latest technological development in the thrust region of image processing.

This paper is aimed to highlight the algorithm for detection of DR using fundus images which are pre-processed with the help of image processing techniques using Python which is a high-level programming language. Also, some of the features necessary to detect the disease are extracted. The analysis gives the specificity and sensitivity of one method which tells the probability of classifying the severity of the disease in patients, helpful for the clinical experts in diagnosing of the disease.

**Keywords:** Circular Hough Transform (CHT), diabetic retinopathy, fundus images, pre-processing, Support Vector Machine (SVM).

### 22. INTRODUCTION

Diabetes is a disease in which the quantities of blood glucose rises which can also affect patients sight causing diseases like cataracts, glaucoma, and most importantly diabetic retinopathy. It is the condition where damage is caused to the blood vessels inside the eye [1]. In recent years, Diabetic Retinopathy (DR) has become the common causes of low vision provoking blindness, categorizing it as one of the most chronic disease. The World Health Organization (WHO) recently analysed that there are approximately 130 million people all over the world having diabetes, showing regular increase in the number of patients every year [2]. Whereas, the National Eye Institute estimates that 24,000 people become blind every year due to DR [3]. The disease classifies itself as Non-proliferative Diabetic Retinopathy (NPDR) and Proliferative Diabetic Retinopathy (PDR). NPDR shows early stage of the disease which can be cured using laser therapies and surgeries preventing vision loss. While PDR is advanced level of the disease where an abnormal new blood vessels (neovascularization) is formed at the back i.e. at the posterior pole of the eye [4].

The presence of this disease can be diagnosed by examining the retina for its characteristic features, also known as fundus images which are obtained by capturing the retina of the eye by fundus camera. Over a period of last decade, there is a lot of research conducted where detection of DR is based on extraction of features of retinal images [2]. This approach consists of a study of retinal images with an aim of providing ways in diagnosing and identifying the severity of the disease. It broadly includes application of image processing and it's algorithms on captured retinal images [1]. This area has been achieved a great progress in recent times which proved an improved medical care for the patients.

In this paper, a detection algorithm is propounded for DR with the help of captured fundus camera images taken from diaretdb0\_v\_1\_1 database available on internet [5]. Section 2 provides the summary and flow diagram of the proposed system. The overall approach performed in the algorithm using python language, is discussed in sub-section 3 with the help of python code. Also, results are shown in section 3.4 by analysing performance parameters using SVM classifiers, concluding the overall methodology in the final section 4.

### 23. PROPOSED METHODOLOGY

An automatic detection of DR with the help of fundus camera images taken from diaretdb0\_v\_1\_1 database has been proposed in this algorithm. The flow diagram for DR detection is shown in *Fig. 1*. The fundus camera diagnoses the patient's eye and captures the image of interior surface and posterior pole of the eye, which comprises of retina, macula, optic discs and blood vessels. These images are already captured and available as

standard DR database with calibration level 0 available as a public database for DR detection. By using this database, the disease can be detected [5].

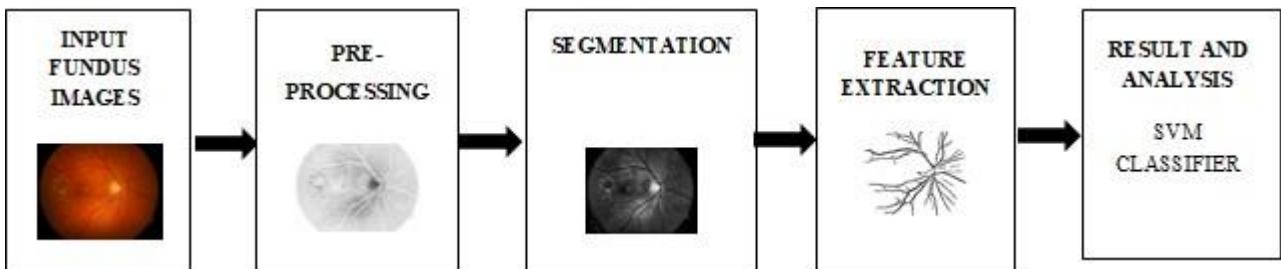


Fig. 1: Block diagram for DR detection

The algorithm starts with pre-processing stage which is based on green channel extraction. Among the three independent channels- Red, Green and Blue (RGB), green channel contains the maximum information and high contrast. Hence the captured image is converted to green plane [3]. Further several image processing techniques are implemented including adaptive histogram equalization CLAHE, thresholding and filtering so as to remove noise [4]. Then the image is segmented using morphological functions where features are extracted and classified using Support Vector Machine (SVM) classifier, demonstrating its outcome as specificity and sensitivity of the images.

## 24. OVERALL APPROACH

The proposed algorithm consists of different modules and following sub points depicts the detailed explanation of each step included in block diagram.

### 3.1 Input fundus images

DIARETDB0 is a copyrighted database which can be used for scientific research purpose [5]. The database contains 130 colour retinal images out of which 20 images are of normal healthy eye. Rest 110 images contains characteristics and abnormalities found in DR disease. These images in database are captured with a 50 degree field of view angle using fundus camera. Also the images contain imaging noise and optical aberrations whose amount is undefined. The data is helpful for evaluating the performance of diagnosis methods in general. *Fig. 2* shows some of the abnormalities found in DR detected retina. Some of them to name are exudates, micro aneurysms, haemorrhages and blobs.

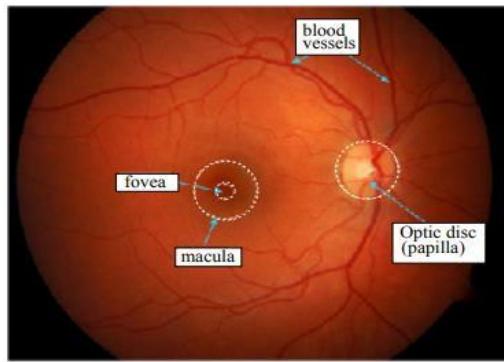


Fig. 2: Abnormalities in retina

### 3.2 Pre-processing

Captured colour fundus or retinal images show poor contrast and contains noise abbreviations, hence pre-processing stage has to be performed on these images, which is the initial stage in detection process. This algorithm is applied to improve the contrast, image enhancement and removal of noise. Green channel is mainly extracted in pre-processing as it showcases the best background contrast. In red channel the abnormalities are visible but it shows less contrast than the green one whereas blue channel contains noise and minimal information [6]. The original colour image is first read using OpenCV (cv2), which is an open source machine learning library and then the green channel 2D array is extracted from the image array. *Fig. 3(a)* shows original fundus image and *Fig. 3(b)* shows its extracted green plane image.

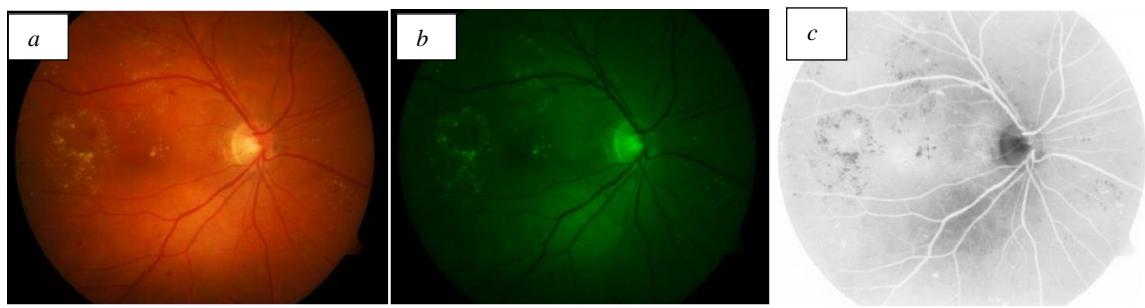


Fig.3: (a) Original image, (b) Green plane image, (c) CLAHE image

Adaptive histogram equalization (ADHE) is performed for enhancing contrast. It is used to improve regional contrast and edge enhancement in each area of image [6]. The input here is divided into tiles, by default 8x8 in OpenCV, and then these tiles are histogram equalized. If possibly noise is present, it will be amplified. The contrast of the grayscale image is enhanced using Contrast Limited Adaptive Histogram Equalization (CLAHE). It is an alternative of adaptive histogram equalization in which there is limited contrast amplification, so as to reduce this issue of noise amplification [3]. If any histogram is above the contrast limit which is already specified, by default 40 in OpenCV, then those pixels are clipped off and equalization is performed. Fig. 3 (c) shows the CLAHE equalized image.

### 3.3 Segmentation

Binary image can be created by image thresholding method using grayscale image. The gray threshold function chooses the threshold to limit the intraclass variance of the black and white pixels [3]. One of the thresholding methods is Otsu's binarization in which automatic calculation of a threshold value from image histogram for an image having two histogram peaks is performed. Otsu's algorithm finds a threshold value ( $t$ ) [9] which reduces the weighted within-class variance given by *Equation 1*.

$$\sigma_w^2(t) = q_1(t)\sigma_1^2(t) + q_2(t)\sigma_2^2(t) \quad \text{Equation 1}$$

For improving image quality further, for example by edge detection or noise reduction, canny edge detection is used which detects wide range of edges. Canny edge detection is an approach to extract useful information from different objects. In this algorithm, the first step is to remove noise by 5x5 Gaussian filters. To calculate first derivative in horizontal direction ( $G_x$ ) and vertical direction ( $G_y$ ), sobel kernel is used [7]. From these, edge gradient and pixel direction is obtained using *Equation 2*.

$$\begin{aligned} \text{Edge Gradient } (G) &= \sqrt{G_x^2 + G_y^2} \\ \text{Angle } (\theta) &= \tan^{-1} \left( \frac{G_y}{G_x} \right) \end{aligned} \quad \text{Equation 2}$$

At every stage, pixel is checked if it is a local maximum in its neighbourhood in the direction of gradient so as to remove unwanted pixel. All these algorithms are obtained using a single function in OpenCV. Fig. 4(a) shows edge detected image.

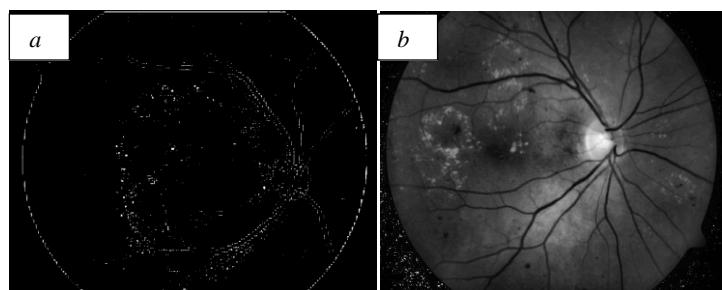


Fig.4: (a) Edge detected image, (b) Segmented image

Image segmentation includes partitioning the digital image into multiple segments. Here, mathematical morphology is used to extract useful image components in post processing steps. Morphological functions include dilation and erosion operation. Dilation is the function to add the pixels to the boundaries of the object

in an image, whereas erosion is the method to remove the pixels in the boundaries of the object [3]. The size and shape of the image to process defines the number of pixels added or removed from the objects in an image. *Equation 3* shows morphological operations used,

Dilation:  $(f + B)(x, y) = \max\{f(x - s, -y - t) | (s, t) \in B\}$

Erosion:  $(f \theta B)(x, y) = \min\{f(x + s, y + t) | (s, t) \in B\}$  *Equation 3*

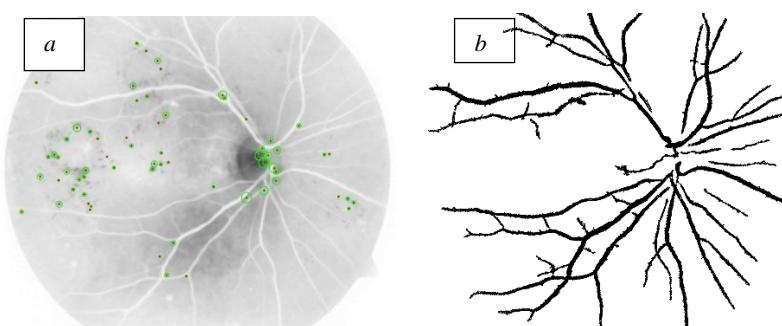
Where  $f(x, y)$  is a defined finite grayscale image function and  $B$  is a binary structuring element. *Fig. 4(b)* shows the segmented image.

### 3.4 Feature extraction

This approach is an important part of image processing as it is useful for detecting the abnormalities in DR [8]. Here, two abnormalities in retina are mainly focussed which are blob (lesions) or blot haemorrhages and exudates. Blob detection is done with the help of Circular Hough Transform (CHT) [3] as shown in *Fig. 5 (a)*. It is the best method that allows the circular objects to be extracted from an image where three parameters are needed to define a circle shown in *Equation 4*

$$C : (x_{\text{center}}, y_{\text{center}}, r) \quad \text{Equation 4}$$

Where  $(x_{\text{center}}, y_{\text{center}})$  define the centre position and  $r$  is the radius, which allows to completely defining a circle.



*Fig.5: (a) Blob detected, (b) Blood vessels detected*

Exudate is another abnormality which leaks out of blood vessels. There are two categories of exudates namely hard and soft exudates. The blood vessel starts to weaken and leak blood and fluid in retina which is a condition called macular edema. Blood vessels are detected and are shown in *Fig. 5 (b)*.

### 3.4 Result and analysis

Support Vector Machine (SVM) is used as a classifier for DR detection. SVM are supervised learning algorithms that analyse data used for classification and regression analysis. A fixed number of randomly selected images are taken to form the training set and the rest of the images compose the test set [6]. Results for analysis have been evaluated by calculating sensitivity and specificity per image for two diabetic retinopathy findings. *Equation 5* shows the formulae to compute sensitivity and specificity [5].

$$\text{sensitivity} = \frac{T_p}{T_p + F_N}$$

*Equation*

$$\text{specificity} = \frac{T_N}{T_N + F_p}$$

Where, True positive (TP) is the number of images identified as DR correctly;

False positive (FP) is the number of images identified as DR incorrectly;

True negative (TN) is the number of images identified as normal correctly;

False negative (FN) is the number of images identified as normal incorrectly.

Sensitivity is the calculation of abnormal fundus classified as abnormal and specificity is the calculation of normal fundus classified as normal, both computed as percentage (%). The result can be analysed based on these two parameters, which is if the sensitivity and specificity values are higher, the method used is appropriate. *Table 1* shows the performance parameter using SVM classifier.

DR abnormality	Sensitivity %	Specificity %
Blob detected	73	70
Blood vessel detected	77	80

Table 1: Results achieved

## 25. CONCLUSION

In past years from the research field of ophthalmology, many methodologies have been developed for automatic detecting and classifying DR. This paper also showcase one of the methodology where input non-mydiatic images are directly taken and several image processing techniques are implemented using python language code. The features which are extracted are blobs and blood vessels, which are two of the important parameters for detecting DR. The methodology can be analysed using sensitivity and specificity of these parameters for SVM classifiers. The result demonstrated indicates acceptable performance measurements so that the algorithm can help the ophthalmologist to detect diabetic retinopathy at the early stage, which is necessary to prevent patient from blindness. All these combinations of the discussed algorithm in image processing provide a base from which a screening test can potentially be designed.

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## Cloud Base Data Management & Data Security on Health Care

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### ABSTRACT

*The present cloud computing time opens another road for organizations to consider moving their information data management solutions to cloud. Data management in the cloud Computing brings many challenges as well as advantages. This paper represents the current state of data management solutions in the cloud and the current direction of research in Data management in Cloud Computing. It is necessary to contemplate that the cloud-based data management is a very fluid field, which means technologies are changing rapidly. It is also important that data security provide for this data information. This paper is an overview of data security issues in the cloud computing. Its objective is to highlight the principal issues related to data security that raised by cloud environment.*

**Keywords:** Service Oriented Architecture, electronic medical records (EMRs), Data security, Data Privacy, Data Management Architecture

### 1. INTRODUCTION

Cloud computing is an emerging technology which provides on demand network access to shared pool of resources like networks, servers, storage, applications or services resulting in minimal management effort and service provider interaction. Grid computing, virtualization, automatic computing, Service Oriented Architecture (SOA), Peer-to-Peer computing and many others all are coalesced in cloud computing in many ways as it uses existing functionality of all and add other perks too. It is a paradigm shift from the parallel and distributed computing, where an organization uses resources as service to —utility computing where you pay-as-you-go like electricity bill. Clients have nothing to do with management and maintenance problems of the resources machines in Cloud Computing. It is the way of future as it makes sharing of system or information much easier but some security issues may arise due to easy sharing of data inside cloud. For avoiding such issues every cloud computing service has an interface and employs a different access control protocol. Sometimes to ensure security, strong password policies are enforced. For different people, Cloud Computing has different meanings so there is no univocally accepted definition of the term. The National Institute of Standards and Technology (NIST) defines cloud computing as. Cloud Computing is gaining a high popularity in the I.T industry as it offers significant benefit by freeing them from the low level tasks of setting up basic hardware and software infrastructures and thus enabling them to focus on innovation and strengthen the business value for their services by providing benefit of reduced cost and easy and fast deployment of resources. It is a paradigm shift into next generation data centres hosted by large infrastructure companies such as Amazon, Google, Yahoo, Microsoft, or Sun.

#### 1.1 SERVICES AND CHARACTERISTICS

The current widely accepted Cloud computing definition is based on the NIST definition that identifies five essential Cloud characteristics

- On-demand self-service.
- Broad network access and diversity of client devices.
- Resource pooling that allows providers to serve multi-tenant customers by managing resource utilization more efficiently using virtualization, resource partitioning and workload balancing
- Rapid elasticity that allows scaling resources dynamically.
- Measured service with the pay-per-use business model.

## 2 WHAT IS DATA MANAGEMENT?

1. Data management is an administrative process that includes acquiring, validating, storing, protecting, and processing required data to ensure the accessibility, reliability, and timeliness of the data for its users. It is a broad term that can refer to a role (a data manager), while also referring to an organizational responsibility.
2. Within the parameters of data management exists responsibility for the entire data lifecycle, from collection to consumption. This includes its point of origin (data provenance) and transformative journey from origination to current point of reference or observation. These attributes are particularly useful in managing data: By describing the journey of a piece of data, visibility becomes available throughout the data pipeline, checks can be monitored, and incidents of compromise or failure can be traced directly to sources.

### 2.1 DATA MANAGEMENT IN HEALTHCARE

Healthcare data management has been a pressing challenge for years, yet there's still a lot of work to be done in order to make healthcare data integration a fluent process. Healthcare improvement initiatives resulted in the introduction of electronic health records (EHRs) and electronic medical records (EMRs), health information exchanges (HIEs), numerous patient databases, continuity of care documents (CCDs), and much more. On the one hand, all of the above can help clinicians and care providers handle data in a more efficient and convenient way. On the other hand, the amount of information has grown exponentially and has driven a need for analytical, clinical, and business intelligence tools to convert the data into meaningful information. The latest can be used to improve clinical, operational, and financial performance.

#### SIGNIFICANT ASPECTS OF DATA MANAGEMENT INCLUDE THE FOLLOWING:

**Data Collection:** Planning and instrumenting software and hardware products to collect data that diagnoses failure and measures success. This includes everything from server log files to mobile app interaction tracking.

**Reference Data Management:** Defines permissible values that can be used by other data fields, such as postal codes, lists of countries, regions and cities, or product serial numbers. Reference data can be home-grown or externally provided.

**ETL (Extract, Transform, Load) and Data Integration:** Loading data from data sources into a data warehouse, transforming, summarizing and aggregating them into a format suitable for high performance analysis.

**Master Data Management:** This describes the method for managing critical organizational data: customers, accounts and parties named in business transactions, formatted in a standardized way that prevents redundancy across the organization.

**Cloud Data Management:** This is the process of integrating data from an organization's ecosystem of cloud applications. The main distinction of cloud data management is that all data storage, intake, and processing takes place in a cloud-based storage medium.

**Data Analytics and Visualization:** Processing selected data from big data sources and data warehouses to perform advanced data analytics, this allows analysts and data scientists to slice, dice, and present visualizations and dashboards.

### 2.2 A HOLISTIC ENTERPRISE DATA MANAGEMENT PLATFORM FOR HEALTHCARE

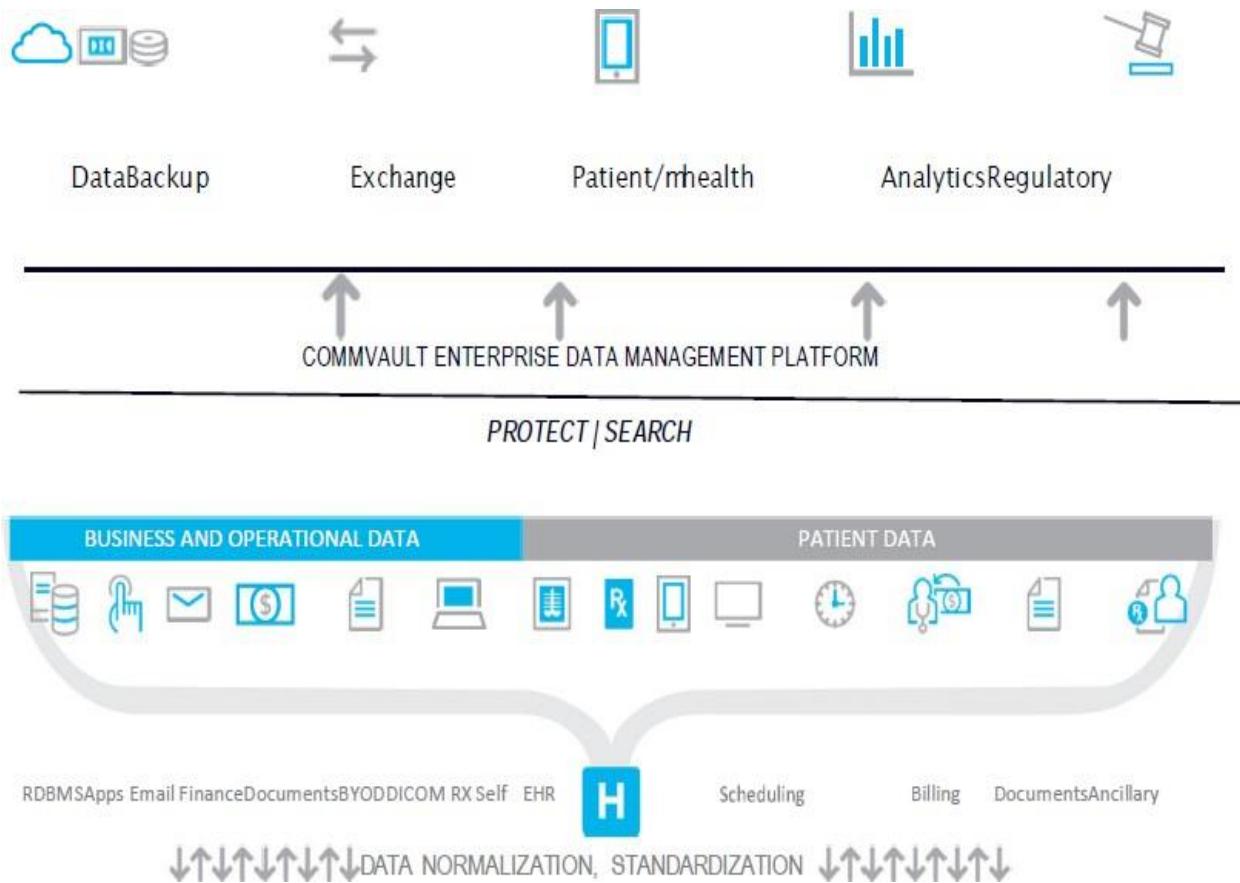
To most effectively address these data management challenges, healthcare providers need a holistic data management platform that spans their entire enterprise and serves a number of critical functions:

- Ingest all data streams and sources
- Normalize this data to make it usable
- Make this data accessible
- Protect the data
- Offer flexibility to accommodate organizational growth
- Simplicity to ensure operational efficiencies

DATA INGESTION	DATA NORMALIZATION	DATA ACCESSIBILITY	DATA PROTECTION	FLEXIBILITY	SIMPLICITY
The platform must be able to ingest various – and growing – streams of data ranging from sources such as multiple EHRs, payer claims, and patient-generated data	The platform must then be able to normalize and standardize the data so that it is usable and able to serve multiple purposes – shared outside of the organization, support analytics efforts, etc.	Ultimately, the data must be made accessible to any application or authorized individual or entity looking to connect with it	In addition to protecting against growing targeting by cyber criminals, the platform must be secured according to various legal (i.e. HIPAA) and regulatory (i.e. Meaningful Use) requirements	The platform must be able to support changing technologies, movement of data to different storage platforms, multiple applications, etc. to reflect the dynamics of a growing and evolving industry	The platform must be easy to manage to facilitate operational efficiencies, reduce costs, minimize organizational disruption, and help drive the standardization of data policies across the organization

## 2.3 COMMVAULT: POSITIONED TO SOLVE THE HEALTHCARE DATA MANAGEMENT CHALLENGE

Commvault data management platform to create a comprehensive healthcare data management platform for enterprise healthcare provider organizations. This platform is being designed to support and enable all of the ways in which data will drive the performance of these organizations in the future.



## CURRENT SOLUTION PORTFOLIO FOR HEALTHCARE

Commvault currently helps approximately 2,000 healthcare organizations throughout the world manage data across their enterprise. Commvault is unique in offering a single solution for keeping all enterprise healthcare data

— clinical and business data alike — fully protected and accessible.

BUSINESS SOLUTIONS	EHR DATA PROTECTION	ENTERPRISE IMAGE MANAGEMENT
<p>Management and protection of core healthcare data assets:</p> <ul style="list-style-type: none"> <li>-Backup, recovery and archive Cloud</li> <li>-Application and Data Management</li> <li>-Mobile and Endpoint Data Protection</li> <li>-Search and eDiscovery</li> </ul>	<p>Management and protection of EHR (Epic and MEDITECH) system information:</p> <ul style="list-style-type: none"> <li>-Minimize downtime and clinical disruption</li> <li>-Minimize time-to-restore</li> <li>-Vendor- and platform-independent</li> </ul>	<p>True vendor neutral archiving for your entire enterprise:</p> <ul style="list-style-type: none"> <li>-Built with the power of the Commvault platform</li> <li>-Industry-unique</li> <li>-High data migration speeds available</li> <li>-Cost-effective</li> </ul>

## DATA MANAGEMENT ARCHITECTURE IN CLOUD

Articles considered in this section deal with cloud based data management solution architecture. Data management in cloud is still a broader area, but the articles are limited to the topics of large scale data storage, massive parallel query execution, and facilities for analytical and query processing.

**Data security in cloud:** An article is included in this category if it adds any value to the existing knowledge related to data security in cloud.

**Data privacy in cloud:** An article is included in this category if it adds any value to the existing knowledge related to data privacy in cloud.

### A. Data Security in Cloud

As more and more organizations are considering moving data to the cloud and the critical nature of the applications, it is important that clouds be secure. The major security challenge with clouds is that the owner of the data may not have control of where the data is placed. Virtualization paradigm in cloud computing results in several security concerns.

One of the main security issues authors point out is that the users are unaware of cloud security. Cloud users may think they do not have to worry about the security of their software and data anymore because they're in expert hands.

### B. Data Privacy in the Cloud

The issue of protecting confidential data is not new. There has been extensive research in the area of statistical databases. There are increasing concerns about invasions of and potential threats to privacy of personal information by information technology. But most of the studies in this stream of research tend to approach the privacy issue from a data miner's standpoint.

## CONCLUSION

After going through various cloud-based data management information, it is almost certain that large scale data analysis decision support systems, tasks and application-specific data marts are more likely to take advantage of cloud computing platforms than operational, transactional database systems. The current research indicates that most of the research in this area is happening in conjunction with the basic cloud principles, such as dependability, availability, security, and privacy. This paper provides an insight into the past and present cloud-based data management issues and current research interests. Insight into the past and present of cloud-based data management allows for identifying the gaps in the previously mentioned area of data management. Cloud-based data management study areas such as private and personal cloud and data privacy still require more detailed study and research.

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## ‘A Study on Third Party Assistants (TPAs) in Health Insurance Sector w.r.t Claims Processing’

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### INTRODUCTION

Health insurance is an insurance that covers a whole or part of a person's risk in medical expenses, which exposes the risk to many individuals. By assessing the overall risk of health care and health system expenses at the risk pool, an insurer can develop a regular finance structure, such as a monthly premium or payroll tax, to provide money to pay for health care benefits specified in insurance accord to. Profits are handled by a central organization, such as a government agency, private business, or not-for-profit organization.

According to the Health Insurance Association of America, health insurance is defined as "coverage that provides for the payment of benefits as a result of illness or injury. It may include damages from accident, medical expenses, disability or accidental death and dissatisfaction. Insurance is included for "

If an accident happens that needs urgent medical help, we go to the hospital. Those who have an insurance policy can breathe a little, but those who cannot get into a financial crisis.

We have insurance companies that take out health insurance. However, we do have a TPA, i.e. ‘Third Party Assistant’. A third party that resolves health insurance claims issues. As soon as a person is admitted to the hospital, the TPA receives a hint.

To understand the role and application of a TPA, let's gather more insights about it.

### OBJECTIVES OF STUDY

1. To study the concept of ‘Third Party Assistant’ in Health Insurance Sector.
2. To study the various roles played by ‘Third Party Assistant’ with respect to Claims Processing.
3. To suggest the new innovations or techniques can be used by health insurance companies with respect to claims processing.

### RESEARCH METHOD

Descriptive method of research is followed for the study,

### SOURCES OF DATA

Secondary data is used including Online Newspapers, Magazines, Internet ,IT Research Journals etc.

### LIMITATIONS OF STUDY

Only published and commonly known technologies are studied and suggested.

Only ‘Claims Settlement Processes’ in health insurance sector has been considered and studied.

### FINDINGS

#### ❖ Concept of TPA

#### What is a TPA?

A Third Party Administrator is an entity that processes insurance claims that are permitted under the Mediclaim Directive. Generally, these administrators are independent, but can also act as a unit of the insurer. These positions are licensed by the Insurance Regulatory IRDAI.

The number of insurers, health insurance sales, types of health products and buyers has increased significantly over the years. Ultimately, it became difficult to keep track of the work, which did not result in high quality services. For this reason, IRDA selected third-party administrators. Since then, a TPA has been responsible for: consistent high-quality services and processing of extensive health insurance applications.

## RELEVANCE OF TPA

A third-party administrator takes care of hospital bills and other costs. While you're worried about a family member or friend's illness, you can just take care of them. The rest is taken over by the TPA. Each insurance company appoints a TPA for your service. You don't have to pay directly to the administrator. A TPA can either approve non-cash claims settlement or refund later. In no case of complaints or inquiries will the insured person contact the TPA directly. For an insured person, the connection is only between him and the insurer. In summary, we can say that TPA is relevant for:

- Share immense knowledge about healthcare services.
- Improve the quality of services.
- Manage and investigate claims.
- Note the cashless and refund.

## ❖ ROLE OF TPA IN HEALTH INSURANCE

A TPA plays a crucial role in the complete processing of health insurance applications. In the practical world of insurance, some of the jobs of a TPA can relate to the following:

### ISSUE THE HEALTH CARDS TO THE INSURED

A validation process is carried out for each policy issued to the policyholder. This is achieved by issuing an authorized health card. This card contains the insurance number and the TPA, which is responsible for processing claims.

The insured person can present this card at the time of admission to the hospital and report the occurrence of the claim to either the insurer or the TPA. It is one of the essential documents needed to process claims.

### SMOOTH CLAIMS PROCESSING

A TPA is responsible for speeding up the claim as soon as it is reported by the insured. Your job is to review all of the documents submitted for the application. It can request as much information as is necessary to check the details. Claims are settled either cashless or refundable.

In any case, a TPA must check all documents. In the case of cashless, the TPA can collect the documents from the hospital. In other cases, the TPA can request the receipts and invoices from the policyholder.

### ARRANGE VALUE-ADDED SERVICES

In addition to processing claims and issuing cards, a TPA also provides other services such as ambulances, wellness programs and others.

### HOTLINE FACILITY

All policyholders can access the information and other assistance to call their TPA. This facility is available 24/7 for customer service and can be called from anywhere in India. Policyholders can also check the status of their claims on toll-free number 1800-258-5956.

### STRENGTHENS THE HOSPITAL NETWORKS

A very important element for the use of health insurance is a TPA. A strong network of hospitals is also being set up where policyholders can receive treatment. The TPA strives to find the best hospitals that can quickly work cashlessly and enable collective bargaining.

### HELP FOR POLICYHOLDERS

A TPA is an intermediary between the insurance company and the policyholder. Your job is to simplify the application process for health insurance. As we know, there can be two types of claims: a) cashless and b) reimbursement.

As soon as there is a need for medical treatment or emergency treatment, the policyholder visits a hospital. If the person is hospitalized for at least 24 hours (unless otherwise stated, such as cataracts), a claim is permitted.

In this case, the policyholder will inform the TPA or the insurer about the approval and the need for treatment. The TPA then asks the hospital to arrange a cashless facility if possible. Otherwise, the claim for reimbursement will be processed. Upon completion of treatment, the hospital will send all invoices to the TPA if the cashless payment has been approved. If not, the policyholder must submit the documents later.

The authorities of the TPA check the invoices and other documents that are permitted to settle the claim. In the case of cashlessness, payment is made to the hospital. However, the costs for reimbursement go to the policyholder through the insurance.

### **List of Third Party Administrators as per IRDA as on 21<sup>st</sup> November,2019 given on below link-**

[https://www.irdai.gov.in/ADMINCMS/cms/LayoutPages\\_Print.aspx?page=PageNo3649](https://www.irdai.gov.in/ADMINCMS/cms/LayoutPages_Print.aspx?page=PageNo3649)

#### **❖ CONCLUSION**

- Rising health care costs to deal with health problems. The insurance industry gained a new dimension of professionalism with a Third Party Administrator (TPA).
- Third-party administrators are middlemen between insurance companies, policyholders and service providers (Hospital and nursing home). TPAs are offering cashless services at this time of hospitalization for policyholders, claims and billing for hospitals and takes over the further administration for the insurance companies.
- TPA s are Assisting insurance companies in maintaining their insurance policies. A TPA service is designed to provide better services to policyholders.
- Despite policy holders being satisfied with the services of Third-Party Administrators (TPAs) are areas where reforms were expected to enhance the quality of services in the areas of enrolment number issuance, ID card facilities, customer support services, cashless hospitalization facilities and claims-processing and settlement.

To improve customer support services, cashless hospitalization facilities and claims-processing and settlement insurance company, it is suggested that some new technologies should be inculcated by insurance companies.

#### **❖ SUGESTIONS**

Following New Techniques can be used in settlement of claims in Health Insurance Sector for customer's improved experience and replacing TPA by establish –

- **Artificial Intelligence** – Using AI in claims processing is exploring new ways to improve the customer experience.
- **Telematics**- It will show great promise for driving more efficient claims management as well as helping to prevent fraud.
- **Digital Tools** – It includes Voice Analytics & Chat bots can potentially help insurers improve every aspect of the claims processing.
- **Drones** – This is quiet new but tested technique having flying cameras who will work as a new insurance inspectors
- **Claims Apps**- It will become a integral for digital transformation by providing services , such as mobile capture and customer communication management.
- **Block Chain Technology** – This technology can be used for eliminating and detecting frauds on one click or at your finger tip which is now impossible in earlier.

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## Evaluation of the Impact of the QMS Principles of Customer Focus, Process approach and Leadership in the Implementation of Aerospace Standards

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### ABSTRACT

*Obtaining aerospace standard certification is a mandatory requirement for all the industries in the field of Aviation, space or Defence. The field of aerospace is particularly suitable for India with availability of large number of technically skilled personnel in the country. The aerospace companies in our country can clearly compete in the International market due to this competitive advantage. These industries have to mandatorily obtain AS standard certification in order to enter the international arena. The OASIS database (Online Aerospace Supplier Information System) of IAQG lists more than 5000 companies having AS 9100D certification out of which 630 are from India. Most of these companies are located in the southern states of India. The AS standards developed by the International Aerospace Quality Group (IAQG) are meant for ensuring standardization of operations and safety as well as performance of the product in the Aerospace field. The certification is the proof that the organization has Aerospace Quality Management System (AQMS) in existence in its regular operation. It was found out in our earlier study that several improvements are perceived by members in the organizations where AQMS was adopted with strong basis on QMS principles in the implementation methodology. It also emerged that the principles of Customer Focus, Process approach and Leadership are dominant leading to perceivable improvements. This paper evaluates the impact of the results in the organizations where these dominant principles are dovetailed in the implementation methodology of the AS certification in the operational processes.*

**Keywords:** Quality Policy, Quality objectives, AS 9100D certification, ISO 9001:2015, OASIS database, Aerospace Quality Management System (AQMS), Aerospace field, Action steps of the QMS principles viz., Customer Focus, Process approach & Leadership, Expected results in operations, Certification steps, ISO 9004 Standard

### INTRODUCTION

When AS 9100D certification is obtained by an organization it gives confirmation that organizational processes ensure conformity of the product with laid down requirements and the relevant documents are available to the customer or regulatory agencies for verification. It is also an assurance that the organization has methods to prevent entry of counterfeit parts in the manufacturing process as well as product safety while the product is put in actual operation. The organization mandatorily has to take preventive measures to reduce non-compliance of technically approved and cleared processes. In A,S&D industry, Quality management system based on the standard called AQMS is complex but provides assurance of quality equal to a level of safety and performance demanded at an international level.

In order to obtain the AS certification an organization has to mandatorily carry out the following steps:-

Adopt a Quality Policy for the whole organization as per clause 5.2 of AS 9100D

Establish measurable Quality objectives for the different departments of the organization as specified in clause 6.2 of AS 9100D

Designate a specific member of the organization as the Management Representative to oversee the requirements of the standard as specified in clause 5.3 of AS 9100D.

Train personnel to be internal auditors and conduct internal audit

Conduct Management Review as per clause 9.3 of the Standard

Design the operational processes as per the clauses of AS 9100D and provide documented information in support of the same

Maintain Documented Information in support of having carried out the stage tests as required for the product and services and the specified parameters are met

Provide documentary evidence to the external auditors to support that the above mentioned activities were carried out

Organization also needs to prove that quality objectives have been realized and in the cases where they could not be met remedial or corrective actions were taken.

The above specified steps are the bare minimum activities which must be completed to obtain certification in accordance with AS 9100D. Realization of these steps need not necessarily bring in perceivable improvements in the organizational members in the larger perspective. This whole activity may remain as a departmental work for QA staff or the office of Management Representative with the rest of the organization not getting any feel of the QMS. In various organizations where the researcher has carried out the study, this fact was observed. Making AQMS as a working culture is the goal to be reached rather than just obtaining certification to satisfy the interested parties. The theme of the research is to evolve methods to make the above stated goal a reality with minimum of infrastructure expenditure. These methods can be adopted even for organizations having QMS as per ISO 9001:2015 also as the steps are generic in nature and clauses are similar to the extent of 70%.

## 1.1 STATEMENT OF PROBLEM AND PURPOSE

A large number of AS certified A,S & D industries are established in the southern states of India viz., Kerala, Karnataka, Andhra Pradesh (undivided area) and Tamil Nadu which form the population of this study. The paper is focused in assessing how the dominant AQMS principles viz., Customer Focus, Process Approach and Leadership are translated into action in the implementation methodology of the AS certified companies in these four states. It is critically looked in to how well the results are perceived by the members in these organizations and how the progress on the basis of qualitative performance is manifested. Several action steps specified in the ISO 9004 Standard-Managing for the sustained success of an organization: A quality management approach are assessed to be in existence and commensurate results are achieved or not.

The salient factors influencing the implementation of AS certification which leads to the statement of problem of the paper are

Availability of ample skilled technical and non-technical personnel

Very high cost of certification activities

Requirements set by AS standard being achievable due to professionalism of personnel

Need of continual improvement to enable Indian industries to reach global standards, and

Establishing quality consciousness as a culture in the organizational system of work

## 1.2 OBJECTIVES OF THE STUDY

Assessing the adoption of the major QMS principles viz., Customer Focus, Process approach and Leadership in implementation steps in AS certified companies.

Determining the level of acceptance of AQMS by members as a culture

To develop implementable suggestions for the organisations

## 2. REVIEW OF LITERATURE

KT Thomas (2006) has suggested adoption of an effective QMS for aeronautical industry in India, which can meet DGAQA & DGCA requirements. In the paper, essential features of an effective QMS are compared with standards of other countries viz., QCSR: 2002 (DGAQA, India), Def Stan (MOD, UK), ISO, AQAPs (NATO) and aerospace standards (AS) of Society of Automotive Engineers (SAE). Evolution, relevance and review of the existing standards to meet the requirements of the industry as well as regulatory authority, have been made to bring out the special features and differences. It is concluded that the standard AS-9100 (Rev D) can be well adopted in the Indian Defence Aeronautical Industry.

## 2.1 COUNTRY WISE SPENDING OF A,S & D INDUSTRIES

Study by AeroDynamic Advisory & Teal Group on Ranking of Countries (2017) based on spending in A,S &D Industries shows the relative positions as in the Table I

This study has revealed that 87% of the international industry are in the A,S&D field which was amounting to a worth of \$731 billion.

The investment of the USA alone comprised almost 49% of the global total, amounting to \$408.4 billion, which is higher than the total of 25 countries put together.

**Table-I: Country wise spending in aerospace (2017)**

Ranking	Country	Industry Size (in billions of US\$)
1	United States	408.4
2	France	69.0
3	China	61.2
4	United Kingdom	48.8
5	Germany	46.2
6	Russia	27.1
7	Canada	24.0
8	Japan	21.0
9	Spain	14.4
10	India	11.0

Same authors (2019) had brought out that the potential for development for India is very high with its large reserve of tech savvy personnel. Relevance of the study in this direction is also enhanced due to the factors mentioned below:-

By providing training to the organizational members in implementation steps of the AQMS in Indian AS industries, sustainable international competitive advantage can be achieved

Indian A,S & D industry can successfully face challenges internationally

The performance standards in Indian A,S & D companies can continually improve

Quality consciousness in operational processes of the A,S &D organisations can become a cultural aspect.

Izabela Sprycha (2006) has emphasized that competitive advantage can be realized in today's business by focusing on Quality Management and in the field of aviation, the wider scope of security also gets covered. It is brought out that by adopting the steps conforming to the AS Standard in a systematic way in the processes of production and service provision incremental improvements can be realised. Various aspects in the adoption of the quality management system in the aviation industry are exhaustively analysed and the appropriate quality standards for forming the basis to build a good QMS are recommended.

## RESEARCH METHODOLOGY

Overall Design: Qualitative survey & Analytical

Design of sample: Probability sampling method

3.1 Collection of data: Universe for this study comprised 319 AS certified companies in the four states viz., Kerala, Karnataka, Tamil Nadu and Andhra Pradesh as listed in OASIS website (Online Aerospace Supplier Information System) of IAQG as on 23 Dec 2018. The sample size required for this universe at 95% confidence level is 151. The questionnaire was forwarded to 250 companies through their official e-mail id. A total of 153 responses were received, which are analysed through SPSS (Statistical Program of Social Sciences). Sample size being 50% of the Universe, a higher degree of accuracy is expected from the analysis. State wise distribution of the samples is as shown in Table II.

**Table II: AS certified companies in Southern states**

Sl. No	State	No of AS certified companies
1	Kerala (Ker)	42
2	Tamil Nadu (TN)	40
3	Andhra Pradesh (AP) (undivided area before division)	36

	into Telangana)	
4	Karnataka (Kar)	35
	Total	153

### 3.2 DESCRIPTIVE STATISTICS

The survey focused on the following combination of results as perceivable

Profit up by 5%, Losses less by 5% and Higher Morale

Less employee turnover, less absenteeism and higher morale

Profit up by 5%, Less employee turnover and higher morale

The results indicated the under mentioned pattern in the various states under study.

First set of results is perceivable in organisations where actions related to customer focus are prevalent.

Second set is in organisations where the response to actions and results conforming to Leadership are dominant.

Third set are perceived where response to actions and results conforming to Process approach are prevalent.

The current performances of the factors in AQMS in the states are as shown in Table III :-

**Table-III: Relative performance of factors in states**

SI No	State	Customer Focus	Process Approach	Leadership
1	Kerala	66.67 %	64.3 %	71.42 %
2	Tamil Nadu	72.5 %	82.5 %	77.5 %
3	Andhra Pradesh	61.1 %	66.67 %	69.4 %
4	Karnataka	74.3 %	68.1 %	65.7 %

### 3.3 Inferential Statistical Analysis

Reliability studies require that the adopted scale should be able to ensure constancy in the construct which is under evaluation. The value of Cronbach's Alpha estimated for the complete questionnaire is 0.821. The other variables in the questionnaire viz., A1-A6 obtained highest value of 0.910 and A11-A15 achieved a value of 0.731. The variables A6-A10 have obtained value of 0.809. All the three Alpha values are quite high indicating that the survey has very high internal consistency.

#### 3.3.1 Analysis of Action steps of Customer Focus

Hypothesis: Incorporation of customer focus steps in AQMS generates improvement in higher profits, lesser losses and higher morale

H0-Null Hypothesis: Relationship doesn't exist between Customer Focus steps in AQMS principles and improvement in profits

H1-Alternate Hypothesis: Relationship exists between Customer Focus steps in AQMS principles and improvement in profits

**Table IV Effects of Customer Focus**

Variable 1 (results)	Variable 2 (actions of Customer Focus)	Correlation Coefficient	p-value
Enhancement of profits and reduction in losses (R1)	Communication of needs and expectations of customer (A1)	0.876	0.000**
	Availability of list of direct and indirect customers (A2)	0.356	0.000**
	Measurement of customer satisfaction (A3)	0.692	0.000**
	Linking objectives to customer's needs and expectations (A4)	0.825	0.000**
	Efforts are as per long-term planning perspective (A5)	0.418	0.000**

\*\* In the 2-tailed tests, for 0.01 level of confidence Correlation is significant

Interpretation: Since the value of p is less than 0.01 correlation is significant at 1% level of confidence. It can be inferred that R1 has highest correlation with A1 having r value of 0.876, then with A4 having r value 0.825 and A3 obtaining r value 0.692. Actions on A5 received r=0.418 and A2 obtained r=0.356. Regression analysis, to identify the contribution of independent variables to the result R2, has generated the results in Table V.

**Table V: Regression Analysis of Customer Focus Steps**

Dependent Variable	Independent Variables	R2	Adjusted R2	F value	P value
Enhancement of Profits and reduction in losses (R1)	Communication of needs and expectations of customer (A1)	0.692	0.68	67.32	0.000*
	Availability of list of direct and indirect customers (A2)				
	Measurement of customer satisfaction(A3)				
	Linking objectives to customer's needs and expectations (A4)				
	Efforts are as per long-term planning perspective (A5)				

As p value is less than 0.05 in these cases, the model has significance at 5% level of confidence. With R2 being 0.692 Adjusted R2 value becomes 0.68. The interpretation is that 68% of the variability in result R1 is caused by independent variables A1 to A5. The remaining 32% of variability occurs because of other unexplained factors. The p value for this iteration was also assessed in order to estimate the contribution of the independent variables. Results are as shown in Table VI.

**Table VI: Relative effect of action steps of customer focus**

Independent Variable	Beta	P value
Communication of needs and expectations of customer A1	0.601	.000
Availability of list of direct and indirect customers A2	0.292	.009
Measurement of customer satisfaction A3	0.513	.043
Linking objectives to customer's needs and expectations A4	0.536	.001
Efforts are as per long-term planning perspective A5	0.365	.000

Here also the "p value" of all the variables (A1-A5) are less than 0.05, which means that all the variables A1-A5 have significant effect on the result R1. The value of beta is also evaluated which has the interpretation as: "The results get incremental improvement by the amount of Beta for each increment of A1-A5". This allows the conclusion that R1 receives high contribution from A1,A4 and A3. The factors A5 and A2 generate less contribution but are significant considering the beta values.

### Analysis of Action steps of Process Approach

Hypothesis: Incorporation of steps of Process approach in AQMS generates enhancement in profits and lesser employee turnover
Null Hypothesis (H0): Adoption of Process approach doesn't generate any effect in enhancement in profits and less employee turnover
Alternate Hypothesis (H1): Adoption of Process approach generates significant effect in enhancement in profits and less employee turnover

**Table VII: Effect of Process Approach action steps**

Variable 1 (results)	Variable 2 (actions of Process approach)	Correlation Coefficient	p-value
Enhancement of profits and less employee turnover (R2)	Clear definition of Objectives for the system and processes(A6)	0.786	0.000**
	Establishment of clear Authority, responsibility and accountability (A7)	0.825	0.000**
	Proper evaluation of Organization's	0.472	0.000**

	capabilities and resources prior to action (A8)		
	Evaluation of all main processes as well as their interrelations as a system (A9)	0.618	0.000**
	Process exists for continual improvement of AQMS (A10)	0.356	0.000**

\*\* In the 2-tailed tests Correlation is significant at the 0.01 level.

### Interpretation

As p value is less than 0.05 in these cases, the model becomes significant at 5% level of significance. Correlation estimations shows that R2 has highest correlation with A7 having  $r=0.825$  followed by the factor A6 having  $r=0.786$  and A9 with  $r=0.618$ . The remaining factors A8 & A10 have the values  $r=0.472$  and  $r=0.356$  respectively indicating lesser effect. Regression analysis of the action steps gave the following results.

**Table-VIII: Regression Analysis of the action steps**

Dependent Variable	Independent Variables	R2	Adjusted R2	F value	P value
Enhancement of profits and less employee turnover (R2)	Clear definition of Objectives for the system and processes (A6)	0.794	0.753	72.12	0.000*
	Establishment of clear Authority, responsibility and accountability (A7)				
	Proper evaluation of Organization's capabilities and resources prior to action (A8)				
	Evaluation of all main processes as well as their interrelations as a system (A9)				
	Process exists for continual improvement of AQMS (A10)				

As "p" value being lower than 0.05, the model has significance at 95% confidence level. Regression analysis has given R2 value of 0.794 which on adjustment becomes 0.75 indicating that 75% of the variability in result R2 is caused by the above mentioned variables A6-A10. Thus the result R2 gets highest contribution from A7 followed by A6 and A9. The remaining factors A8 & A10 have lesser effect, even though the r values are significant. All these factors combined influence the achievement of the result R2 to 75%.

### 3.3.3 Analysis of Action steps of Leadership

Hypothesis: Incorporation of steps of Leadership in AQMS generates lesser employee turnover and lesser absenteeism
H0 : Adoption of action steps of Leadership make no difference in employee turnover and absenteeism
H1: Adoption of action steps of Leadership makes good difference in employee turnover and absenteeism

**Table IX : Analysis of Action steps of Leadership**

Variable 1 (results)	Variable 2 (action steps of Leadership)	Correlation Coefficient	p-value
Less employee turnover and absenteeism (R3)	Organization's mission, vision and strategies are communicated throughout the organization (A11)	0.786	0.000**
	Culture of trust and integrity exists in the orgn (A12)	0.825	0.000**
	Leaders at crucial levels are positive examples to people in the organization (A13)	0.552	0.000**
	Contribution of people are recognized, encouraged and rewarded at appropriate levels (A14)	0.608	0.000**
	System exists for skills qualification and career planning (A15)	0.426	0.000**

\*\* In the 2-tailed tests Correlation is significant at the 0.01 level.

Analysis: As p value is less than 0.01 in these cases, the model has significance at 99% level of confidence. Values in Table IX indicate that result R3 has highest correlations with A12 having r value 0.825, A11 with r value 0.786 and A14 with r at 0.608. A13 & A15 have relatively lesser effect even though the values indicate good impact on result R3.

### 3.3.4 Analysis of effect on morale

Hypothesis: Incorporation of customer focus, process approach and leadership in AQMS generates higher morale
H0 Null Hypothesis: Adoption of action steps of customer focus, process approach and leadership doesn't generate any effect on morale of personnel of organization.
H1 Alternate Hypothesis: Adoption of action steps of customer focus, process approach and leadership generate good effect on morale of personnel of organization.

**Table X: Analysis**

	Sum of Squares	df	Mean Square	F	p value.
Between Groups	41.479	2	23.730	3.651	.022
Within Groups	1083.774	173	5.524		
Total	1125.253	175			

It is seen that high morale is existing in all the organizations where these principles are practiced. Analysis by one-way Anova on the effect of the variables on morale has given results as shown in tables X & XI below:-

**Table XI: ANOVA**

Existence of high morale (R4)	N	Mean	Std. Deviation
Customer Focus V1	55	42.2353	2.12813
Process approach V2	47	39.7792	2.00591
Leadership V3	41	40.8333	3.17080
Total	153	40.9493	2.43495

### Interpretation

As "p" value is less than 0.05 in these cases, the model becomes significant at 5% level of significance. The null hypothesis of no significance gets rejected as the "p" value is less than 0.05. Thus, all the three variables V1, V2 & V3 influence the result R4 quite significantly. The mean values indicate that higher effect on R4 is when variable V1 (Customer Focus) gets incorporated (mean = 42.2353)

## 4 FINDINGS

Findings obtained from the study are :-

Higher profits as well as lesser losses are seen in organisations where Customer Focus actions are predominant (A1- A5).

Higher profits and less employee turnover are perceived in organisations where Process Approach steps are implemented (A6- A10).

Lower employee turnover and absenteeism are perceivable where action steps conforming to Leadership principle are prevalent (A11- A15).

d. When the implementation steps include any of the action steps conforming to the principles of customer focus (V1), process approach (V2) or leadership (V3), higher morale (R4) is perceived by organization members commonly in all the organizations.

## 5. SUGGESTIONS

Improvements are perceivable in organisations where the action steps conforming to the QMS principles of Customer Focus, Leadership and Process Approach are adopted. The action steps listed in ISO 9004 are reproduced below which may be adopted by organisations in their implementation methodology of the AS 9100D as well as for ISO 9001: 2015.

## Action steps - Customer Focus (V1)

- A1 - Communicating of needs and expectations of customer
- A2 - Linking objectives to customer's needs and expectations
- A3 - Measuring of customer satisfaction
- A4 - Making available the list of direct and indirect customers
- A5 - Taking efforts as per long-term planning perspective

## Action steps – Process Approach (V2)

- A6 - Defining clearly objectives for the system and processes
- A7 - Establishing clear Authority, responsibility and accountability
- A8 - Estimating realistically organization's capabilities and resources prior to action
- A9 - Evaluating all main processes as well as their interrelations as a system
- A10 Maintaining exists for continual improvement of AQMS

## Action steps – Leadership (V3)

- A11 - Communicating the mission, vision and quality policy throughout the organization
- A12 Maintaining Culture of trust and integrity in the organisation
- A13 Having Leaders at crucial levels as positive examples to people in the organization
- A14 Recognizing and rewarding the contribution of people at appropriate levels
- A15 – Maintaining system for skills qualification and career planning

Higher Morale (R4) is a common factor in all the three areas. Organizations would do well if they realign their organisational processes along any of the steps mentioned above which would boost the morale of their members.

It was also seen that customer focus steps lead more towards higher morale as well as higher profits. Hence it would be a wise move by top managements, if action steps (A1-A5) conforming to customer focus (V1) are adopted as a culture, rather than breakthrough improvement.

## 6. CONCLUSION

Implementing the action steps of customer focus, process approach and leadership in AQMS implementation can generate very high level of perceivable improvements in the organizations as a matter of routine. These can further lead to continual improvements, which can enable them to achieve sustained competitive advantage. The biggest advantage resulting from effective standard adoption is that there is no need for expenditure on infrastructure. Requirement will be for repetitive training, which consumes only time and effort. Further the top managements need to monitor progress of quality objectives periodically.

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## Impact of Age on Portfolio Size and Scheme Category Selection by the Indian Mutual Fund Investors

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### ABSTRACT

*Substantial Financial Theory Stressed The Importance Of The Life Cycle Approach Of Starting To Invest At A Young Age Early With A Higher Allocation To High Risk And Highly Volatile Equity Asset Class And Gradually Shifting Post-Retirement Life With Less-Volatile And Safer Debt Investments. Investor Age Is Undoubtedly An Important Demographic, And Substantial Research Is Centered With It A Dimension In Their Study. Increased Inflows Into Mutual Funds Are Increasing The Necessity For Deeper Studies Centered Around Investor Behavior In This Area.*

*This Paper Tries To Understand If The Age Of A Mutual Fund Investor Has A Bearing On The Portfolio Size. Further, An Attempt Is Made To Find Out If Age Impacts The Diversification Of A Portfolio Across The Three Mutual Fund Categories - Equity, Hybrid, And Debt Categories. Findings From This Study Can Help Governments And Regulators In Better Policymaking And Regulation, And Asset Management Companies (Amc) In Building Or Positioning Their Mutual Fund Schemes Better. Insights From The Paper Can Help Investors In Better Management Of Their Investments.*

**Keywords:** Investor Age, Financial Gerontology, Mutual Fund Investing

### 1. INTRODUCTION

Several studies stressed the importance of socio-economic and demographic factors like age, marital status, academic qualification, location, income levels and belongingness to minority racial/ethnic groups on investor risk tolerance and decision making (Shinde & Zanvar, 2015). Age, along with other factors, influences the investment amount, periodicity and frequency, scheme selection, and the duration of the investment. Age is a critical component in behavioral analysis and differentiates investor behavior. Studies centered around the age factor are of interest for a wide audience including economists, policymakers, regulators and financial product designers.

The number of financial instruments would be significant at a young age because the investor possesses money, risk appetite, and is open to the experimentation of various financial instruments. But as age progresses, marital status changes and the number of family dependents change force consolidation and seriousness in maintaining the investments. Life should be more modest and so should be financed as retirement age approaches (Karen, 2010). Stock-picking acumen of stock market traders and investors slips with age. Studies indicate that as an athlete loses his speed and agility, investors lose financial decision-making skills as they turn older.

As investor gains age, they gain immense investing knowledge and practical experience that makes them stronger in the fundamental concepts of investing. They are less prone to behavioral bias (e.g., (List, 2003), (Dhar & Ning, 2006)) because they follow the “rule of thumb” strictly. However, their effectiveness in applying this investment to knowledge and skills gets degraded because of their declining cognitive abilities. Less-educated investors hailing from lower-income minority groups are more prone to this (Korniotis & Kumar, 2011). It is conventional for investors to invest in less risky tools and portfolios, increase their preference to diversify, trade or transact less frequently, focus on greater year-end tax-loss selling and hold a handful of manageable few.

The theory says that when a geographical state has a higher number of the aging population, their risk-sharing abilities go up and thereby the investable pool of money that goes into investing would be high. However, research by (Korniotis & Kumar, 2008) shows that age differences across states do not have an incremental

ability to explain the cross-sectional variation in the level of risk-sharing. Older investors make worse investment decisions (Korniotis & Kumar, 2011) and thereby reduce their risk-sharing levels.

Investors across all ages have an attitude towards saving. But do they need help in managing their investments as their age progresses? A survey by (NYLIM, 2005) shows investors across all age groups seek help, particularly more so in comprehensive financial planning. However, financial advice from professional advisors acts as a compliment, rather than as a substitute for acquiring financial knowledge (Lusardi, Michaud, & Mitchell, 2017). Indian mutual fund investors across all age groups prefer the advice of agents followed by doing their analysis and advice from the media. Relative/friends' feedback comes last in their decision making. Preference for mutual funds is high over other similar investment options (such as bonds, debentures, IPO, secondary market, and derivatives) in both Indian town and village investors across all age groups (NCAER, 2011).

## 2. REVIEW OF LITERATURE

Increased inflows into mutual funds and the almost lack of age-based financial planning increases the need to research this topic. Findings from (Patel & Modi, 2017) on a study of 100 investors from South Gujarat show that investment decisions are less dependent on demographic factors and that investor risk-taking ability is moderate across all age groups. Findings from (Neha, 2016) done on 188 mutual fund investors from Tezpur, Assam, however, showed that age remains an influencing factor. Young Delhi investors in the age group of 21-30 years show good interest in investing in Mutual Funds because they find it right as they start with their job or business and it is the appropriate age for long-term investments according to a study by (Geetu, Bansal, & Gupta, 2016). A study by (Taparia & Babu, 2019) on 120 investors from Kolkata likewise provided similar findings that the age group of 20-30 had the most active investors followed by 30-40 and 40-50. Research work on 172 business school students of Indonesia found that investment knowledge affects investment interest of students. (Hasanah & Redny, 2019)

Household income levels and financial difficulties negatively impact human cognitive function, which is a leading cause of disability amongst older people. Research by (Ishikawa, 2019) showed that with every drop of 1 percent of household income, there is a possible 2.2 percent cognitive impairment even in countries like Japan where universal health cover is in force.

Not just investment decision making, but overall financial skills, including the ability to assess their financial capacity and reporting skills, get downgraded considerably (Campbell, Lichtenberg, Hall, Teresi, & Katja, 2018). Because of this, they are at a loss of financial skills & judgment as well as in their ability to detect and prevent financial exploitation. Information reporting scales such as the Lichtenberg Financial Decision-making Rating Scale (LFDRS) (Peter, Stoltman, Ficker, Iris, & Mast, 2015) and the Family and Friends Scale (FFS) were developed for informant or assisted financial data collection.

A working paper by (Fonga, Koh, Mitchell, & Rohwedder, 2019) found that fewer of the respondents aged 50+ know the concept of risk diversification and that one unit increase in financial literacy score is increasing 8.3 percent propensity to hold stocks and a 1.7 percentage likelihood of following an age-appropriate investment glide path.

## 3. RESEARCH GAP

A substantial literature exists on various investor traits and demographic factors both in the domestic and international context. However, the size dimension of the mutual fund portfolio and the category of schemes invested in, in the context of age, is an understudied area. A clear void exists, and this research paper tries to address that.

## 4. OBJECTIVES OF THE STUDY

1. To understand the age-related aspects of investing and its importance.
2. To understand if the investor age and size of mutual funds have any association.
3. To understand if the investor age and category of the scheme have any correlation.

## 5. SIGNIFICANCE OF THE STUDY

1. Investors who understand the importance of age and can plan their financial future well.

2. Understanding the age of investor preferences towards saving and investing can help financial service providers in building better products.
3. India is the second-most populous country in the world. Because 50% of its population is below 25 years of age (Census 2011), the country can be called a young country. This status of being a young country will hold good for the next two decades. A large working-class pool will be available who can channel a part of their earnings into savings and investing.
4. Indian population will be aging too. Persons above 60 would increase from the existing 8.9 percent of the population to 19.4 percent of the population and persons above 80 would increase from the existing 0.9 percent to 2.8 percent by 2050 (United Nations Population Fund (UNFPA) report). Countries like India will have to make stronger old age policies as well as budgetary allocations quickly failing which it has to bear the impact of unsustainable pension liabilities on their entire economy such as in Greece.

## 6. HYPOTHESES

$H_{01}$ : There is a significant association between the age of the investor and the number of schemes invested by them.

$H_{02}$ : There is no significant relationship between the age of the investor and the category of schemes invested by them.

## 7. RESEARCH METHODOLOGY

### 7.1 RESEARCH METHOD

The study is done based on quantitative research using the descriptive research design to get a possible insight if age and mutual fund portfolio size are related to each other. The sampling process followed for this study is non-probabilistic convenience sampling. The sample frame comprises of retail mutual fund investors. Non-parametric tests - ANOVA and Chi-square are used to test the two hypotheses framed for the study.

### 7.2 DATA & DATA SOURCES

Investor mutual fund portfolios form the primary data for this study. Respondents are reached out through the social circle of the researchers and were requested to provide their consolidated portfolio sent by their mutual fund registrar or as managed in an online portal. Seventy-three respondents from across India without any specific geography or regional bias, age criteria or preference have provided their portfolios for the research. Data collected during June - September 2019 is fed into a spreadsheet before coding and analyzing it with SPSS statistical tool. Two data sets, one relating to age and the number of schemes and the other relating their age to mutual fund scheme categories, were prepared and analyzed.

### 7.3. DATA ANALYSIS

$H_{01}$ : There is a significant association between the age of the investor and the number of schemes invested by them.

Chi-square test is used to test the above hypothesis. Statistical findings are as mentioned in the below table.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.460 <sup>a</sup>	48	.864
Likelihood Ratio	42.070	48	.713
Linear-by-Linear Association	.627	1	.429
N of Valid Cases	73		

Table 1 Chi-Square test -5% level of significance

From the above table no. 1, it can be observed that the calculated Chi-square p-value at 5% Level of Significance (LOS) is 0.864, is greater than the actual p-value = 0.05 (i.e., 0.864>0.05). Therefore, there is an association between the age of the investor and the number of schemes invested by them. Hence, the null hypothesis framed can be accepted.

Another interpretation is that investors in the age groups between 31-40 years, i.e., 27 investors invest in the maximum number of fund schemes. Following this age group, the next highest number of schemes is by the 41-50 years age group with 23 investors, seven investors from the 51-60 years age group and 12 mutual fund investors from 21-30 years age group. The least investment in terms of number of schemes is by the age group

above 61 years having only four investors. Probably, this is because of the attractive Government schemes available for senior citizens.

In the age group between 31-40 years, out of the total 27 investors in this age group, it is found that 6 investors have invested only in one Mutual fund, 4 investors have invested in 2,5 and 7 number of schemes whereas, one investor has invested in 8 schemes and another has invested in 9 schemes. The remaining have their investments put in 2-3 mutual fund schemes.

$H_{02}$ : There is no significant relationship between the age of the investor and the type of schemes invested by them.

One-way ANOVA test is used to test the above hypothesis. Statistical findings are as mentioned in the below table.

ANOVA						
			Sum of Squares	Df	Mean Square	
Equity	Between Groups	(Combined)		169.639	4	
		Linear Term	Unweighted	4.945	1	
			Weighted	4.447	1	
			Deviation	165.192	3	
	Within Groups			1254.854	68	
	Total			1424.493	72	
	Between Groups	(Combined)		2.623	.656	
Hybrid		Linear Term	Unweighted	.087	1	
			Weighted	.770	1	
			Deviation	1.853	3	
		Within Groups			39.898	
		Total			42.521	
Between Groups	(Combined)		3.490	.872		
	Linear Term	Unweighted	.711	1		
		Weighted	.864	1		
		Deviation	2.625	3		
Debt	Between Groups	Within Groups			58.948	
		Total			62.438	
					72	

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Equity	Between Groups	169.639	4	42.410	2.298	.068
	Within Groups	1254.854	68	18.454		
	Total	1424.493	72			
Hybrid	Between Groups	2.623	4	.656	1.118	.355
	Within Groups	39.898	68	.587		
	Total	42.521	72			
Debt	Between Groups	3.490	4	.872	1.006	.410
	Within Groups	58.948	68	.867		
	Total	62.438	72			

Table 2: One-way ANOVA Classification test -5% level of significance

From the above table, the f-values for the Categories - Equity, Hybrid, and Debt are 0.68, 0.355, and 0.410, respectively. All these values are greater than the p-value 0.05 i.e. 0.68 (equity) > 0.05, 0.355 (Hybrid) > 0.05 and 0.410 (Debt) > 0.05. Thus, age and choice of category for an investor have no significant relationship. All the age groups of investors have no differentiation. Thus, the null hypothesis can be accepted.

The following table shows ANOVA one-way classification analysis of data when the total of the three Categories - Equity, Hybrid, and Debt as one unit.

ANOVA					
Total					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	222.827	4	55.707	2.319	.066
Within Groups	1633.200	68	24.018		
Total	1856.027	72			

Table 3: One-way ANOVA Classification test -5% level of significance - Taking Equity, Hybrid, and Debt as a single entity.

The above table shows the F-value as 0.066, which is greater than the p-value 0.05, i.e.,  $0.066 > 0.05$ ; thus, we accept the null hypothesis. Therefore, we can conclude that age does not have a significant relationship while choosing the category of mutual fund investments.

## 8. FINDINGS

As per the statistical analysis mentioned above, this study finds that the age of the investor and the number of schemes invested by them have a significant association. Further, there is no significant relationship between the age of the investor and the category of mutual fund schemes being invested by them.

## 9. DISCUSSION

### 9.1 Financial Literacy

Age matters in explaining the financial literacy levels of an individual. Like consumers who accumulate knowledge about various products and services with age, even individuals gain financial knowledge with age. Financial literacy levels go up with age to a certain level before it falls. Many surveys have found that middle-aged individuals have the highest literacy level, but their financial knowledge decreases past the middle age (Lusardi, Michaud, & Mitchell, 2017). Middle-aged investors are keen knowledge seekers. Most of the calls made to the NPS Information Helpdesk come from the age group of 25-35 (PFRDA, 2018). Differences in financial knowledge widen with age. The better educated accumulate more financial knowledge just before retirement. However, older people are found to be more financially literate than youngsters (Kadoya & Khan, 2019).

Investors across India and from all age groups feel that inadequate information is the reason for not investing in the secondary market (NCAER, 2011). An interesting insight from the survey is that investors are increasingly investing in mutual funds when they make a windfall gain. Though mutual fund allocation is high in such scenarios, it is one of the several instruments that the investor will be using. Within them, young investors prefer mutual funds over the middle- and old-age investors (NCAER, 2011).

### 9.2 Age & financial decision making

Life cycle studies show that financial mistakes follow a U-shaped pattern. A study on a cross-section of prime borrowers found that middle-aged adults borrow at lower interest rates and pay less in fees compared to younger or older adults. A study went into ten different credit transaction types and found that fee and interest payments get minimized at around the age of 53. This study established a link between age and quality of decision-making (Agarwal, Driscoll, Gabaix, & Laibson, 2009).

Young investors frequently make financial mistakes, but they can make a comeback. They rarely have severe cognitive incapacity - something that old age investors cannot afford. Also, old age investors have far more financial resources to control than young investors (Agarwal, Driscoll, Gabaix, & Laibson, 2009).

### 9.3 Age & investment time-frame

Consistent with the theory, young Indians save for a long time compared to the middle and old age. However, the gap between the age groups is less when it comes to investing (NCAER, 2011).

### 9.4 Age & risk-taking abilities

As observed in the rest of the world, age is a key determinant in understanding the risk-taking ability of an investor (Geetha & Vimala, 2013). Several studies are undertaken to analyze the perceived risk of the investor, and a majority of them point that risk perception declines as age increases. This effect is largely due to higher

investment experiences and financial literacy of older participants. When controlling for these variables, the correlation between age and risk judgment is no longer significant (Sachse, Jungermann, & Belting, 2012).

## 9.5 Age & Life Cycle Theory

The Life Cycle Theory of Consumption, proposed by Franco Modigliani along with his student Richard Brumberg in 1950, says that people make intelligent choices about how much they want to spend at each age, limited only by the resources available over their lives. The theory has several implications on economics and speaks about the savings and investing behavior of individuals, particularly the working-class, as they head towards retirement. The life cycle of savings says that the young have little money while the retired have considerable support. The retired sell off their assets to provide for their living, and with this, the money cycles to the middle and the young (Deaton, 2005).

The risk-taking ability of investors is inversely proportional to the investor age. Sixty percent of old age investors fall in the lowest risk scale (NCAER, 2011). Age is a critical determinant in life stage planning theory that suggests debt asset class to be equal to his age. Hundred minus investor age is the ideal equity component. Starting to invest at a young age can allow investors to make a higher allocation to the equity asset class taking higher volatility risk. Progressive moves by shifting to a blended or balanced portfolio and finally ending up in a debt or bond-asset class helps investors to secure the growth and be conservative at old age (Malkiel, 2015).

A whole class of financial products called lifecycle funds (LCFs), and investment products such as the National Pension Scheme (NPS) offered in India incorporate this feature as a product offering. The Pension Fund Regulatory and Development Authority (PFRDA) allows NPS to offer three variants of LCF - LC 75, LC 50, and LC 25 (PFRDA, 2016). LCF's allow investors to "set it and forget it" by making investments at their convenience and let the system drive the asset allocation for them. The increasing inflow of funds into such products every year shows the growing popularity of such products.

Some studies say that the effect of portfolio size on wealth outcomes over long horizons is so large that it outweighs the volatility reduction benefit of lifecycle strategies in most cases. Thus, following life stage planning will be less important for most investors and is only suitable for those who have already reached their financial goals and accumulated wealth exceeding their retirement targets (Basu, Anup, Drew, & Michael, 2009). Indian investors hardly mimic the life stage model (NCAER, 2011), highlighting the vulnerability and importance of financial literacy.

## 9.6 Financial Gerontology

Gerontology is the study of aging. Unlike its closer peer geriatrics, which represents a branch of medicine, Gerontology is a multidisciplinary field focused on the broader aspects of older age. Recent developments in this area branched into a sub-field called Social Gerontology which included perspectives from economics and finance. A sub-branch of Social Gerontology is the Financial Gerontology, which encompasses aging and human development from the dimensions of finance and business. Joseph Boettner, an American businessman who spent considerable time on personal aging and developed the foundation for this branch. Significant contributions to the subject also came from Dr. Davis W. Gregg, an American business educator, and administrator. The concept of "human wealth span" in early days focussed mostly on old age. Financial resources at this age are referred to as a three-legged stool and comprise the pension, social security, and savings and investment approach. The middle-age dimension is integrated into the financial gerontology theory in 1991-92 with the culmination of the thought of both Gregg and Cutler in a form better known as "Human Wealth Span." The subject expanded from being a mere "study of old age people" to becoming a "study of the multiple processes of aging."

## 10. LIMITATIONS OF THE STUDY

Portfolios of only 73 investors could be collected and studied as part of this research. Though reasonable efforts are put in, the sample size is too small to give an adequate representation of the overall Indian mutual fund market. This research can be extended by including more samples to get more reliable insights.

## 11. RECOMMENDATIONS

Investors can be more successful and focused if they keep an eye on their mutual fund portfolio size considering their financial goals.

With the millennial age group hitting the workplace at a younger age, investors of this age group need to be motivated to inculcate the habit of saving. As observed in the findings, out of 73 mutual investors, only 12

mutual fund investors were a part of the age group between 21-30 years. Thus, potential investors need to be tapped by the AMC's for expanding their ambit of business.

## 12. SCOPE FOR FURTHER STUDY

1. Old age Indian investors prefer traditional savings instruments such as bank deposits and post office deposit schemes. Lack of product awareness and understanding and inability to profile risks on their own are a major deterrent for them prompting them to go to safe havens in the form of savings instruments over investments which always carry risks. However, the younger generation has access to the internet and smartphones that not only provide information but also ease of transaction. This study can further be extended to see if the thought process has changed over the ages.
2. Studies on investor behavior in the context of portfolio size changes in broader time frames incorporating a full market cycle comprising of bull and bear stock market phases can be taken up.
3. Studies on how portfolio size changes for an individual investor over time can be studied.

## 13. CONCLUSION

Financial literacy of an investor increases as age progresses, and so does the quality of financial decision making. Age determines the investor risk-taking ability and investment timeframe. Following the *Life Cycle Theory* helps investors in safeguarding returns, but Indian mutual fund investors appear to be less keen on implementing it.

Investment planning is a continuous exercise and should remain perpetual with age. It is always better to start making investments at a younger age to reap long term benefits. Our findings show that Indian investors start serious investing at middle age (in their thirties) and focus on their life stage goals such as children's education, retirement planning, etc. Further, their inability to shift from equity to hybrid and debt will keep them exposed to risk even as they approach their retirement, exposing them to a higher degree of unwanted risk.

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## Role and Importance of Supply Chain Management in Health Care Industry

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### ABSTRACT

*This paper seeks to contribute towards the cost cutting and well managed supply chain management. My study is put a light on management of inventories of health care needs and how to gain that inventories i.e. supply chain management with efficient manner. Cost cutting in healthcare has become a mantra for many hospitals and physician practices. Management of inventories is as easy as possible if there is well managed supply of health care needs. In healthcare industry, managing and make available of the healthcare supply is a very critical and decentralized process. Healthcare supply chain management involves getting of resources, managing of supplies, and delivering of goods and services to suppliers and patients. To complete the process of supply chain management, physical inventories and information about healthcare products and services usually go through a number of independent stakeholders, including manufacturers, insurance companies, clinics, suppliers, mass purchasing organizations, and several regulatory agencies. However, in order to attain efficiency in the healthcare supply chain, hospitals and physician practices can create substantial cost-cutting opportunities across their organization. Here is a look at what goes into healthcare supply chain management and by reducing spending can overcome the challenges in supply chain management in health care industry. Supply Chain Management plays a very important role in health care industry for management of supply of health care goods and services. This paper helps both managers and academics to get a better understanding of the complexity of supply chain management in health care industry.*

**Keywords:** Health Care, Supply Chain Management, Hospitals, Physician, Health Care Industry.

### INTRODUCTION

The main aim of this study is to present the role of the Health Care Supply Chain Management in health care industry. Supply Chain innovations are becoming a highly popularized issue in the research agenda, as well as in practice. The reason behind is that political and economical factors are raising the fingers towards healthcare issues, the process of local health corporatization, which involves the introduction by the government into the National Health System of control mechanisms similar to the competitive market models; the aging of population; the increasing demand for healthcare goods and services; the rising cost of in-patient and out-patient care; new techniques and new drugs (Medicines) that will continue to drive up the total healthcare cost. Indeed, scares resources and a straight growth in spending, hence, the need of a public health rationalization, especially for meeting increasingly quality demands. All this requires a transformation that affects not only the processes of treatment and diagnosis, but also those of support, especially logistics, which is essential for the processes of service variance, efficiency, and quality and safety processes improvement. Healthcare Industry helps us to explain how changes in the healthcare logistics flow can improve efficiency and reduce costs. In order to minimize the inventory control and reduce the material handling costs of healthcare products, it is necessary to manage the Supply Chain of health care goods and services, following an integrated perspective, capable to overcome limitations between professional specializations and organizations involved in the materials flow from warehouses to wards

### OBJECTIVES OF STUDY

- To know the concept of healthcare supply chain and management.
- To understand the importance of supply chain management in healthcare.
- To study the complexity in healthcare supply chain management.
- To identify the way to overcome the complexity in healthcare supply chain management.

## RESEARCH METHODOLOGY

My research work is based on secondary data available on internet through various articles, notes, data etc and from some of the reference books available to me.

### Concept of Healthcare Supply Chain Management

The Supply Chain is a process that includes all the activities ranging from the need identification of a customer through product selection, negotiation with suppliers, payment, storage, distribution and redistribution. It is a combo of three or more entities directly involved in the upward and downward flows of products, services, finances, and information from a source to final users. The SCM therefore, refers to the upward and downward relationships between suppliers & customers and to solving the problems of functional divisions that occur within and between healthcare organizations. In different words, it extends the concept of partnerships into a multi-firm effort to manage the total flow of goods and services from the supplier to the ultimate users i.e. customer, to achieve greater benefits. In particular, the healthcare Supply Chain in the Italian context generally consists of four main actors: 1) producers (Health Care Industries) 2) purchasers (dealers and wholesalers); 3) providers (healthcare organizations); 4) patients. Initially SCM was developed in the context of production, but its introduction is beneficial to the healthcare industry, whereas it shows vital impact on healthcare organization performance, in terms of reducing wastes, preventing medical errors, improving quality of care, service and operational efficiencies. It includes business activities & operations that integrate a continuous, seamless flow of materials & services for healthcare delivery. There are three types of flow of healthcare services i.e. physical, information and financial flows of goods and services.

### Importance of supply chain management in healthcare

**Supply Chain Management plays a vital role in healthcare, providing healthcare goods and services to healthcare organization is very much important than other area because in this area there is urgency or emergency of patient. So supplying goods and services on time is very much important.** It is good known that supply chain management is an important part of most an organization and is essential to healthcare centre success and satisfaction of customer.

- **Customer Service Expectations**

Customers expect the right product assortment and quantity to be delivered at right time. If this they will get on their need then there will satisfaction of the customers.

- **Reduce Operating Costs**

Retailers depend on supply chains not only to quickly deliver expensive products to avoid holding costly inventories in stores any longer than necessary but also to design networks that meet patient service goals at the least total cost.

- **Efficiency in healthcare SCM**

Efficient supply chains enable a firm to be more competitive in the market place. Patient treatments depend on supply chains to reliably deliver medicine or surgical items to hospitals to avoid shortages that would shut down treatment or recovery.

- **Increases Profit Leverage**

Healthcare centre value supply chain managers because they help control and reduce supply chain costs. This can result in drastic increases in healthcare profits.

- **Decreases Fixed Assets**

Healthcare centre values supply chain managers because they decrease the use of large fixed assets. And fixed assets are the property of the organization.

- **Increases Cash Flow**

Healthcare centre value supply chain managers because they speed up product flows to patients and because of product flow there will be increases in revenue/ cash flow of the organization.

### Complexity in healthcare supply chain management

There is a complexity in the supply chain management of healthcare goods and services due to the various reasons, which are as follows:

- Healthcare supply chain goals are not always aligned within an organization because suppliers may want to use a specific product because they were trained with it, whereas hospital executives aim to purchase the most affordable quality items.
- Healthcare supply chain management is unique due to each stakeholder has their own interests to protect. Different stages in the supply chain flow may be focused on their own goal.
- The healthcare supply chain management process can be inefficient and fragmented and patients also have a voice in the healthcare supply chain management process.
- Healthcare organizations may be able to regularly order the correct sizes of gloves and keep them stocked, but some patients may need more customized medical products, such as latex-free options, depending on their health status.
- Likewise, providers may prefer a specific brand or type of medical product, which could lead to cost concerns.
- Clinicians just want the products when they need them, but to ensure that happens they oftentimes hoard or opt manage their own supplies. This can contribute to cost variance and off contract spending which are hard to recover. One more invisible cost that is often overlooked is the time spent looking for supplies or waiting for someone to deliver what they need.
- Misaligned incentives and independent goals can disrupt the flow of the supply chain for many healthcare organizations.

## Overcome the complexity in healthcare supply chain management

Cost transparency in supply chain management of healthcare organizations is one of way to overcome the complexity in healthcare supply chain management.

- By harnessing price and utilization data, healthcare organizations can track and manage inventory more efficiently and construct more informed purchasing contracts with manufacturers.
- To end up spending lot of money on inventory within these various silos because we live in a world where you can never run out of anything ever from the interest of what is best for the patient.
- When we have visibility of goods from finished goods to the use on the patient and we actually capture demand and consumption versus capturing purchasing activity, we capture consumption activity.
- Various automated tools can help organizations to increase price transparency, such as computerized provider order invoice systems, which can standardize and streamline physician orders, or RFID technology that can capture volumes of data from a product's barcode.
- In value-based care, healthcare organizations are focused on reducing redundancies and eliminating waste, but providers also need to work together to effectively reduce costs and boost performance.
- The supply chain reaches every department within the healthcare centre. You must look at the people in the organization, supply partners, and determine how you can get synergy and maximum productivity out of your clinical and supply chain staffers to achieve your supply chain goals.
- Engaging clinical staff can also help to establish cost-saving habits, discourage hoarding, and empower providers to keep cost concerns in mind when delivering care. Today, health systems must be willing to take risks, and it is very important to let them help craft a solution that they can stick to.

## CONCLUSION

It is concluded that Healthcare supply chain management is the holistic flow of relationships between suppliers and customers. SCM is about efficiently delivering low cost at good quality care as goods and supplies, such as a pair of doctor's gloves, move from point of purchase to point of use i.e. from the place manufacturing to the place of doctors. It is reported that one-third of healthcare organization decision makers believe their healthcare organization supply chain is functioning at maximum efficiency, but the other two-thirds are finding themselves stuck with one foot in fee-for-service and the other in value-based reimbursement. Appropriate supply chain management is not implementing by many of these healthcare organization. Healthcare suppliers have a weak sense of what products they need and what product they have. Pacemakers, defibrillators, and

catheters are merely collecting dust instead of being put to good use in an operating room. Many health care industries are having good supply chain management there are various complexities in supply chain of healthcare goods and services but there are various ways to overcome these complexity by healthcare centre. So now-a-days it's very much important to maintain the good supply chain management of healthcare goods and services to meet their daily needs and requirements.

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## A Descriptive Study on General Health and Quality of Life of Elders in old Age Home, Aruwee, Aynavaram, Chennai, Tamilnadu

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### **ABSTRACT**

*Aging always seems to be an inevitable process of every human being. In this stage, most of the elderly will be having very less health status and declined quality of life. There are few studies in India dedicated to the well-being of elderly and their health problems, in particular to their mental health and their quality of life. The aim of this study is to assess the quality of life and general health status among the elderly population in old age home ARUWE, Aynavaram, Chennai, Tamil Nadu. All elderly people aged above 50 years residing in ARUWE, a old age home in Aynavaram, Chennai, TamilNadu, was involved in the study. With the use of tools like WHOQOL-BREF and GHQ-28 datas were collected. The results were expressed in terms of Frequency. Majority of the respondents have very poor overall quality of life and general health (56.3%),*

**Keywords:** Elderly, Quality of life, Depression, Cognition, Activities of daily living, aging etc.

### **INTRODUCTION**

Ageing usually refers to the process of decline in physical, psychological, hormonal and the social conditions. Aged people suffer with major mental health problems like depression, dementia, emptiness-syndrome etc. These forms of disorder affect their quality of life and general health in one way or the other. The study is going to be carried out in selected old age home in Chennai and going to reveals the quality of life and general health status of the elderly people residing in that home through two types of standardised questionnaire for method of data collection.

### **OBJECTIVES**

To analyse the General Health condition of elders in old age home.

To determine the Quality of life of elders in old age home.

### **RESEARCH METHODOLOGY**

Researcher adopted Descriptive research design so as to describe the variables like quality of life, general health and elders. The method which is adopted to select sample is Simple random sampling under the probability sampling method. Around 48 samples were selected and involved in the study. The researcher used tools like consent form, information sheet, medical records, WHOQOL-BREF and General health questionnaire (GHQ) to collect data required for the study.

### **REVIEW OF LITERATURE**

Ara Old age homes and their profile (1997) said in this study that reason for many old age people residing in these type of homes are due to the breakdown of kinship and family organisations and these condition have left the elderly to be isolated, helpless and economically dependent.

Gopala Krishnan N and David Blane in their study Quality of life in older ages (2008) said that quality of life is often describes with subjective and objective dimensions and the elderly people will usually evaluate their quality of life positively on the basis of various causative factors like mental health, dependency etc.

Gorska-Ciebiada M, Saryusz-Wolska M, Ciebiada M and Loba J Mild cognitive impairment and depressive symptoms in elderly patients with diabetes: prevalence, risk factors, and co morbidity(2014) in this study it is said that prevalence of Mild cognitive disorder was 31.5%, depressive syndrome was 29.7%, and Mild cognitive impairment with coexisting depressive mood was 9.1.

Sowmiya KR, Nagarani A Study on Quality of Life of Elderly Population in Mettupalayam, A Rural Area of Tamilnadu (July 2012) said that the mean QOL score for all the elderly persons put together, the population as

a whole had moderate quality of life. The highest score was for the social relationship domain with mean 56.6 and the lowest was for physical domain with mean score of 45.

Tiwari SC, Pandey NM, Singh I Mental health problems among inhabitants of old age homes: A preliminary study (2012) found that depression were found to be more common about 37.7% followed by anxiety(13.3%) and dementia (11.1%) and also it is said through this study that majority of the inhabitants have psychiatric morbidity and no one was observed physically fit.

## ANALYSIS AND INTERPRETATION

Distribution of respondents based on their age

S.No	Age Category	Frequency	Percent
1	56-60	15	31
2	61-65	8	32
3	66-70	9	32
4	71-75	4	32
5	76-80	8	32
6	81-85	4	32
	Total	48	100

Distribution of Respondents based upon their Physical Domain Score in WHOQOL

S.No	Physical Domain	Frequency	Percent
1	8-14	10	20.8
2	15-21	32	66.7
3	22-28	4	8.3
4	29-35	2	4.2
	Total	48	100.0

Physical Domain score reveals that, about 66.7% of the respondents have very poor physical health, 20.8% of the respondents have poor physical health, 8.3% of the respondents have good physical health and only 4.2% of the respondents have very good physical health.

Distribution of Respondents Based on the Psychological Health Domain in WHOQOL

S.No	Psychological Health	Frequency	Percent
1	6-10	5	10.4
2	11-15	31	65
3	16-20	10	21
4	21-25	2	4.2
	Total	48	100.0

Above table shows that about 65% of the respondents have very poor psychological health, 21% of the respondents have good psychological health, 10.4% of the respondents have poor psychological health and only 4.2% of the respondents have very good psychological health.

Distribution of Respondents based on the Social and Occupational domain in WHOQOL

S.No	Social and Occupational domain	Frequency	Percent
1	0-5	4	8.3
2	6-10	43	90
3	11-15	1	2.1
	Total	48	100.0

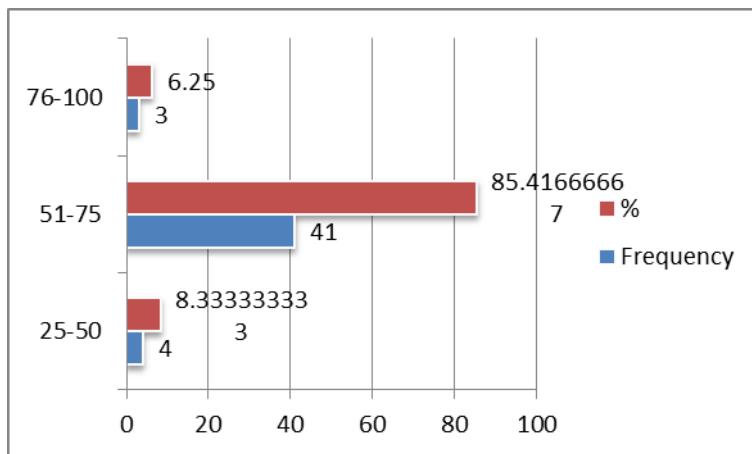
Above table shows that, 90% of the respondents have moderate social and occupational score, 8.3% of the respondents have poor social and occupational score and 2.1% of the respondents have good social and occupational score.

Distribution of Respondents based on the Environmental domain score in WHOQOL

S.No	Environmental	Frequency	Percent
1	11-20	16	33
2	21-30	32	67
	Total	48	100.0

Above table shows that, 67% of the respondents have good environmental domain score and 33% of the respondents have poor environmental domain score.

Distribution of Respondents based upon their Total Quality of life Score



The above figure indicates that 86% of the respondents come under the overall Quality of score category of 25-50 i.e. Dissatisfied with their Quality of life, 8% of the respondents belongs to 51-75 category i.e. they are neither satisfied nor dissatisfied with their quality of life and only 6% of the respondents come under the category of 76-100 which means they are satisfied with their quality of life.

## DISTRIBUTION OF RESPONDENTS BASED ON GENERAL HEALTH QUESTIONNAIRE DOMAINS

Distribution of respondents based on Somatic domain score in GHQ

S.No	Somatic Domain	Frequency	Percent
1	0-7	22	46
2	8-14	20	42
3	15-21	6	12
	Total	48	100.0

Above table shows that, about 46% of the respondents have poor somatic score, 42% of the respondents have moderate somatic score and only 12% of the respondents have good somatic score.

Distribution of respondents based on Anxiety domain score in GHQ

S.No	Anxiety Domain	Frequency	Percent
1	0-7	22	46
2	8-14	20	42
3	15-21	6	12
	Total	48	100.0

Anxiety domain score indicates that 46% of the respondents have poor anxiety score, 42% of the respondents have moderated anxiety score and 12% of the respondents have good anxiety score. It is been explained in this study that more that 40% of the respondents have anxiety symptoms as they become old and due to their physical decline.

Distribution of respondents based on Social and Occupational domain score in GHQ

S.No	Social and occupational Domain	Frequency	Percent
1	0-7	4	8
2	8-14	33	69
3	15-21	11	23
	Total	48	100.0

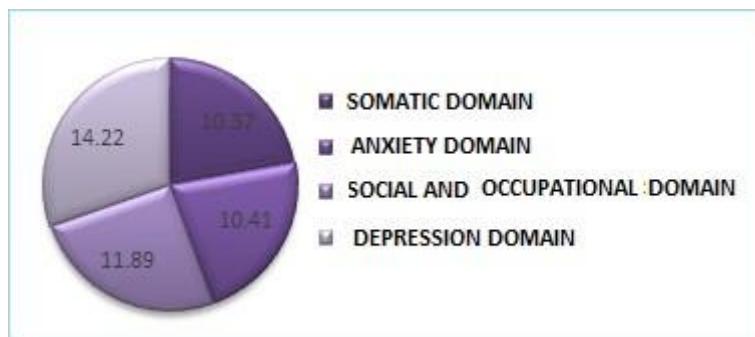
Social and occupational score depicts that 69% of the respondents are having moderate social and occupational score, 25% of the respondents had good score and 8% of the respondents have poor social and occupational score.

Distribution of respondents based on Depression domain score in GHQ

S.No	Depression domain score	Frequency	Percent
1	8-14	32	67
2	15-21	16	33
	Total	48	100.0

Depression domain score indicates that more than half of the respondents i.e. 67% are suffering with severe depression and 33% of the respondents are affected with mild depression. In this study it is reflected that most of the elders in old age home are having depressed health.

Mean score of GHQ domains



Above figure, Mean score of GHQ Domains clearly indicates that the fourth domain i.e. Depression has the highest mean as 14.32zx followed by Social and occupational domain (11.89), Anxiety (10.41) and Somatic at the last at 10.37.

## FINDINGS OF THE STUDY

Majority of the respondents belong to the age category of 56-60 years

Majority of the respondents have poor overall Quality of life and Health (56.3%)

Majority of the respondents have poor somatic domain score (46%)

Majority of the respondents have poor anxiety score (46%)

Majority of the respondents have moderate social and occupational score (69%)

Majority of the respondents are suffering with depression (67%)

## SUGESTION

Elders in old age home are having low quality of life and health as they are becoming old. It can be enriched by providing them various types of needed therapies and treatments. They are depressed as they are separated from their children, they can be treated with various types of recreational activities.

Providing suggestion to Government level means they should concern about their (old people) health and application of many helpful programmes. They must ensure that the schemes that is been already available is reaching them in proper manner.

At Community level, Traditional role of respecting and caring elders should be reinforced at school level and Interventions from the primary level. The experiences and expertise of the elderly should be utilized for the society. Certainly old age is the age, where one feels to share his/her feelings with and need someone aside them whenever needed. They wish to interact more as they may feel lonely.

## CONCLUSION

It can be infer from this study that elderly residing in old age home are being suffered with low quality of life and general health status. Due to various precipitating factors they are suffering with serious depression. Elderly in general should be taken care by their family members and they should not be left alone in these old age homes, which may affect their mental health status because their glory will give a better insight to their life

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## Food Insecurity with Special Reference to Income and Expenditure Pattern of Households in Selected Village in Thiruvallur District, Tamilnadu

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### ABSTRACT

*Food security is when a person is able to obtain a sufficient amount of healthy food on a day-to-day basis. People who do not consume enough food each day suffer from food insecurity, which is when a person is unable to obtain a sufficient amount of healthy food on a day-to-day basis.*

*Poverty easily coexists with food insecurity and is the main cause of hunger and malnutrition. Although urbanization is increasing, the poor are still mainly in the rural areas. An estimated 7.3 million people move into the rapidly growing urban areas of India every year.*

*The causes of existing food insecurity can be better viewed under three concepts namely the: 'traditional concept' which includes factors such as unavailability of food and poor purchasing capacity; 'socio-demographic concept' which includes illiteracy, unemployment, and overcrowding, poor environmental conditions.*

### INTRODUCTION

India is a country of its people, being the world's largest democracy. Indians have had freedom of speech, religion, and the press ever since their constitution was adopted on January 26, 1950. Within this democracy people still live everyday being food insecure. "Food insecurity exists when all people, at all times, do not have physical and economic access to the sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." Poverty easily coexists with food insecurity and is the main cause of hunger and malnutrition. Poverty exists when there is lack of income, productive malnutrition, illiteracy, homelessness, inadequate housing, unsafe environment, social discrimination, and many more factors. More than 850 million people all over the world live everyday being food insecure. One in seven people live with a problem that can be fixed. "Malnutrition not only denies people their right to health; it also has serious economic implications. Malnourished children are less able to concentrate in school, and malnourished adults are less able to work effectively – thus undermining productivity and economic growth." Although urbanization is increasing, the poor are still mainly in the rural areas. An estimated 7.3 million people move into the rapidly growing urban areas of India every year. Though the number of middle class citizens is growing, there is an extreme gap between the rich and poor. Around 35 percent of the population is living below the poverty line. The growing population is over straining natural resources.

### OBJECTIVES OF THE STUDY

The major aim of this is to examine the performance in food security in India along with some concerns relating to food security in respect of the following:

6. To assess the income pattern of selected households in village,
7. To analyze the expenditure pattern of households,
8. To find out food intake and health,
9. To assess the Reasons for declining the production and per capita availability of food grains.
10. To assess the ways to improve global food security

### FOOD SECURITY IN INDIA

Since the advent of the Green revolution in the early-'70s, the country has avoided famine even during adverse weather conditions.

India has become self-sufficient in food grains during the last thirty years because of a variety of crops grown all over the country.

## METHODOLOGY

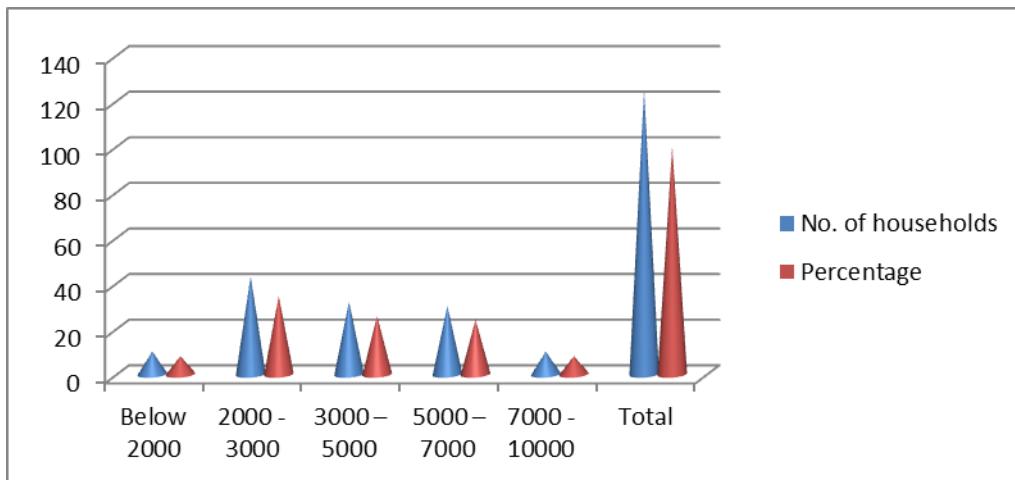
The data for this study were collected through primary and secondary data sources. Primary data were collected through interview schedule. Secondary data were collected from internet, books, magazines and journals in order to know theoretical background of this area.

The area of the present study is killikodi panchyat , Tamilnadu state, which is situated in thiruvallur district, ponneri taluk. Totally 100 respondents were selected from this village by using simple random sampling method.

## Analysis and interpretation

Income Range	No. of households	Percentage
Below 2000	10	8
2000 -3000	43	34.4
3000 – 5000	32	25.6
5000 – 7000	30	24
7000 – 10000	10	8
Total	125	100

Source : primary data

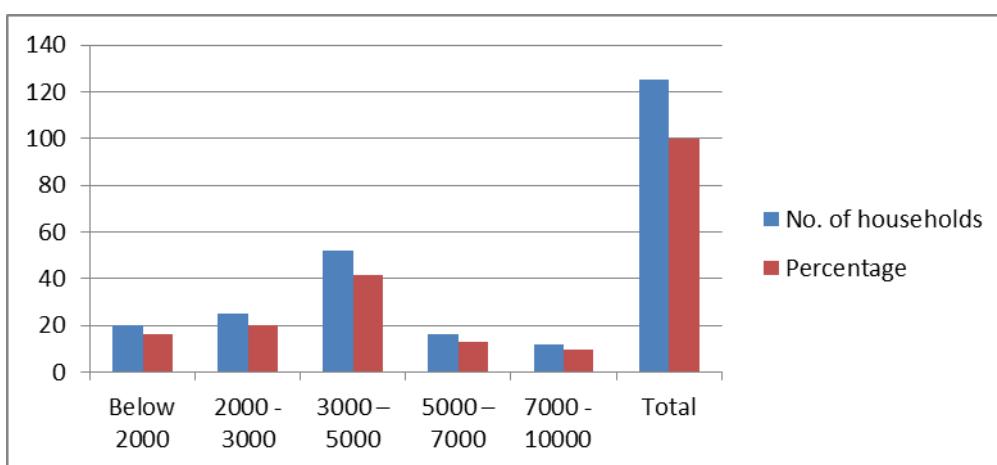


The above table and figure shows that 8% of the respondents come under the income group between Rs. 2000, and between 7000 and 10000. 24% of the respondents come under the income group between Rs. 5000 -7000.

## Expenditure of food items:

Expenditure Range	No. of households	Percentage
Below 2000	20	16
2000 -3000	25	20
3000 – 5000	52	41.6
5000 – 7000	16	12.8
7000 - 10000	12	9.6
Total	125	100

Source: Primary data



The above table reveals that 20% of the respondents to expenditure of food items between Rs 2000-3000. 41.6% of the respondents to expenditure of food items between Rs.3000 – 5000.

## REASONS FOR DECLINING THE PRODUCTION AND PER CAPITA AVAILABILITY OF FOOD GRAINS.

- The performance of food grains production provides negative growth rate. These several factors which have great impact on food grain production. These are:
- Rapid growth of population in India at the expense of growth rates of food grains.
- The increase in the price of crude oil and devaluation of U.S. Dollars led to increase in food prices in INDIA as well as all over the world. Commercialization of agricultural products during the era of globalization has decreased the production of food grains. Due to liberalisation and globalization, the production of food grains is considered as unprofitable in India.
- Rapid urbanization and industrialization in India have led to encroaching of the agricultural lands.
- Because of unscientific, unsystematic and excessive use of chemical fertilizers, fertility of land has been reducing day by day
- Exploitation of ground water because of agricultural, industrial and domestic use also creates critical situation for food grain production.
- Food security is directly or indirectly related to climate change. Any alteration in climate parameters such as temperature and humidity which govern crops growth will have direct impact on the quality of food produced indirect linkages pertain to catastrophic events such as floods and droughts which are projected to multiply as consequences of climate change leading to huge crop loss and leaving large patches of arable land unfit for cultivation and hence threatening food security.

## WAYS TO IMPROVE GLOBAL FOOD SECURITY

6. Close the yield gap. By 2050, 120 million hectares of natural habitats will be converted to farming in developing countries, the World Wildlife Fund estimates.
7. Use fertilizer more efficiently.
8. Raise low water productivity.
9. Target food for direct consumption.
10. Reduce food waste.

## CONCLUDING OBSERVATIONS

India achieved success in combating transient food insecurity caused by droughts or floods, in miserably failed to make much dent in chronic food insecurity as reflected in the low energy intake and high incidences of malnutrition. The overall improvement in nutritional status has also been very slow. There is chronic under-nourishment in about half of the population, particularly among the vulnerable groups of children, women and elderly from the lower half of the expenditure classes. Curiously, the proportion of consumption expenditure

spent on food is slowly going down even in the households with chronic under-nourishment. Under nourishment in the bottom 30% of the expenditure class is alarming. And even the middle 40% is not free from it. The mounting food stocks miserably failed to banish mass under-nourishment. To sum up a majority of the households spent fewer amounts of nutritional items; because the household's income is low the nutritional status not only depends on the income and also depends on family size of the holds. So the government policies and introduction of new poverty eradication scheme may be help for achieving success in this of social reconstruction and development.

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## Pro- Environmental Behavior of Employer and Employees towards Green Work Place and Sustainability – An Empirical Study

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### **ABSTRACT**

*The purpose of this research is to reduce, moderate and make use of their working environment by green Psychology behavior and adopt for green environment and sustainability. The aim of this article to know the role of employer and employee towards their green working environment, to highlights the significance of green working environment, to study the psychology of going green and to provide suggestions for promoting sustainability environment. An experimental study is conducted to know the going green working environment. Hence we conclude that there is consent among everyone that we are in global warming era and activities of human is a crucial cause of this occurrence. It is an essential part of every employer and employee to keep their green working environment and create sustainability of environment. Environmental sustainability endeavor to enlarge the welfare level of people by defending raw material resources that are used to meet personal needs, and also by preventing various effects resulting from the creation of waste. It would be better if the management clearly defines their employees about strategy to maintain green work place and environment sustainability policy.*

**Keywords:** *Pro-environment behavior, Employer and Employee, Psychology, Green organization, Sustainability*

### **INTRODUCTION**

Its goal is to provide an example of the critical contribution that the sector of work and organisational psychology could make to know-how and selling inexperienced behaviour within the place of job. The difficulty of weather change and environmental sustainability is one that has become vital for organizations at some point of the beyond decade. This chapter objectives to offer an insight into the approaches that establishments currently take to inspire seasoned-environmental behaviour among their personnel and to consider the position that Human Resource (HR) departments may want to play in dealing with and implementing environmental tasks and attractive personnel to act in a greater seasoned- environmental way. Of direction, converting people' behaviour within present organisational structures and techniques is simplest one element of the puzzle which we ought to solve if we are to triumph over the trouble of sustainability. As the pace of eco-innovation shifts from an incremental, responsive mode in which it may be notion of a reaction to inefficiencies which take area within existing technological, social, organisational and cultural milieu, the role of such insights from psychology turns into important in developing a extra strategic method to the larger scale transformation of companies.

### **GREEN WORK OVERALL PERFORMANCE**

The survey reports that additional folks recycle reception than they are doing at work across a large vary of reclaimable materials, however even those that do recycle at work do thus but they are doing reception. One reason behind this distinction may be that use facilities aren't provided the least bit workplaces, Such problems embrace raising awareness of what, if any, use arrangements are place in situ and additionally providing clear steerage near to employees regarding their responsibilities and people of the organisation in regard to use moreover as precise directions regarding what employees have to be compelled to waste order for arrangements to be effective, for instance whether or not or not employees got to kind rubbish or simply place it bashed an equivalent bin.

### **THE PSYCHOLOGY OF GOING GREEN**

Psychology has an awful lot to mention approximately how green behaviour is initiated, the strategies that are vital for understanding green attitudes and values, the execution and manage of specific sorts of behaviour and the elements which are key to keeping behaviour through the years, mainly over durations which amplify beyond that in which an intervention genuinely takes location. Green business is huge enterprise these days.

Going inexperienced, or as a minimum being visible to be inexperienced brings benefits to the enterprise including greater reputation, competitive gain, decreased running costs and extended margins and long run benefits inclusive of nonreliance on virgin substances.

## How Do We Interact Our Team Of Workers And Exchange Behaviour?

The scope of our paintings is extensive and we realize it'll regularly become extra hard for us to preserve to make similarly environmental enhancements. As we are seeking for in addition exchange we want to engage our body of workers in greater innovative and progressive methods. Before attractive with team of workers you need to ensure that you have the proper facts and clear messages to ship: Generally, though, our personnel can't act in the event that they do now not have clear messages right from the pinnacle of the agency via to their line managers to tell them that environmental control must be part of anybody's choice making. This isn't clean and we've not completely carried out this but. The fact that our internal surroundings method is one in all most effective ten sub techniques of the Environment Agency's corporate plan suggests our dedication so we use it as a lever to get extra interest.

1) Positive messaging and 'nudging' 2) Getting senior administrators involved 3) Make it part of normal enterprise reporting and construct it into your training and human useful resource (HR) approaches 4) Buying kit 5) 'Star charts' Some 'kit' ideas Voltage optimisation – Bring in a sparky – Fewer, and automated lights – Rainwater harvesting – Wind generators 6) Find the more vocal team of workers members 7) Inclusive inexperienced groups and an Idea scheme Encouraging team of workers to increase their own ideas and take movement is critical to trade their behaviour but additionally to spark off adjustments in different peoples behavior. Limit or do away with their selections 9) Constant badgering – relentless however consistent 10) Publicity

## RECOMMENDATIONS FOR PROMOTING SUSTAINABILITY IN LARGE ENTERPRISES

A variety of tips for imposing sustainable practices at paintings may be made on the basis of the outcomes of this take a look at. 1) Encourage flexible operating as a way to keep power; for instance, enable group of workers to work at home in which possible. 2) Set 'green' goals. Ensure that personnel at all ranges are privy to the objectives and are supported to carried out them 3) Provide comments to body of workers concerning the employer's environmental performance. This helps to improve private 'meaningfulness' and as a consequence need to have a high-quality impact on sustainable behaviours four) Provide education and training regarding sustainability at work. This must permit group of workers to feel that they have got more control over their surroundings, and again facilitates to improve 'meaningfulness' 5) Offer rewards and incentives to encourage green behaviour inside the place of business 6) Consider implementing schemes such as the Environmental Champion community.

## REVIEWS

Roth & Bansal (2000) revealed three motivators that induce company ecological responsiveness: competitiveness, complying with the regulation and ecological responsibility. Research performed by Ampleo, a corporation of Occupational Psychologists, found out extra reasons why corporations feel the want to 'cross inexperienced'. These include value reduction, strength protection, attraction and retention of personnel, staff well being, more suitable group of workers skills and productivity, high quality business popularity and advanced services and products. A variety of writers (e.G. Savitz, 2006) make reference to the triple backside line (economy, environment and social) or what has been referred to as 'the three P's'; humans, profit, planet.

Esty and Winston (2006) see clever agencies as those who get ahead of the green curve and lower each financial and operational danger. Their environmental strategies offer added levels of freedom to perform, income and grow. Any company that enjoys the advantages indexed here could be higher described as a 'smart' company than a 'green' company.

Hubbard (2009) defines every component of the TBL as follows: financial overall performance is simple and encompasses merely monetary aspects of the employer, inclusive of income and income boom; social performance is the impact an business enterprise has at the groups in which it is based and also those working for the agency; and environmental performance generally refers to the amount of assets utilized by enterprises (energy, water, land), in addition to the via-merchandise of its activities (waste, air emissions, chemical residues).

As Davis and Challenger (2009) explain, psychologists are already efficiently changing behaviour in many regions and by way of 'reframing the inexperienced trouble as a extra conventional organisational problem, just as some other inside the workplace' there may be no cause now not to triumph with inexperienced issues additionally.

Reporting occasional occurrence of recyclables as non-incidence is something that has been located in preceding studies of non recyclers (McDonald & Oates, 2003). Equally, assertions that no facilities exist at paintings need to be handled with caution as several respondents said that there have been no centers in Banchory to recycle metals (despite the fact that food and drink cans are blanketed in the fortnightly doorstep collection and banks are to be had at the recycling centre as well as at some of points in the course of the metropolis) or garden waste (despite a devoted bypass positioned at the recycling centre).

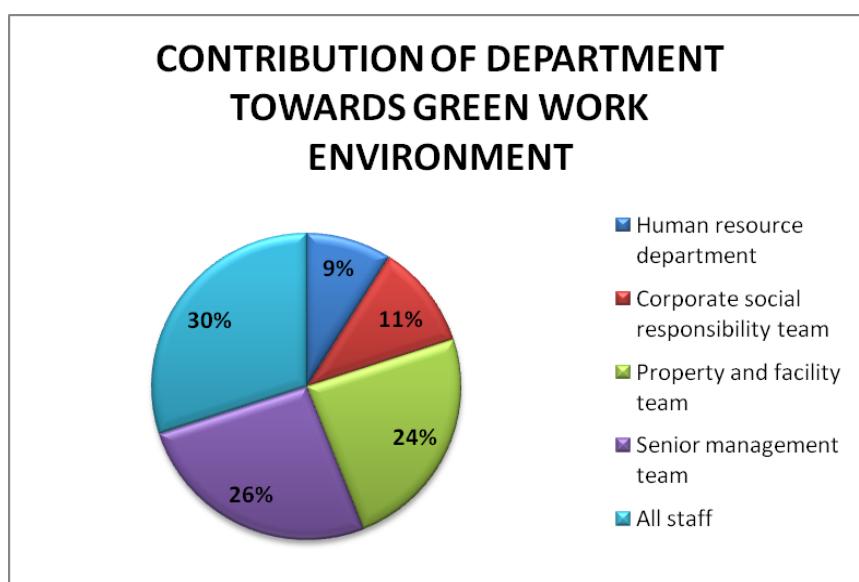
Two of the great problems that have been pronounced as having a negative impact on the extent to which human beings engage in inexperienced behaviour such as recycling, related to their preconceived thoughts and attitudes approximately such behaviour (e.G. Nigbur, Lyons & Uzzell, 2010)

## **HUMAN BEHAVIORS IN RECYCLING AT HOME AND WORKING ENVIRONMENT.**

Majority of the humans maintain their homes with lot of recycling techniques compared to their working environment. Its due to level of interest, free time, innovative ideas, free decisions etc., Even person who do's lot of recycle behavior at home with wide range of materials do not like to translate into professional life. Majority of the working people feels that it will be very difficult to do recycle in work settings, due to lack of facilities. Whilst it is likely that in many workplaces some materials, such as glass, are found in lower quantities than they might be at home, it is extremely unlikely that they are entirely absent from a workplace. For example, although jam jars and ketchup bottles might be relatively rare, soft drink bottles and coffee jars may well be found in many workplaces.

## **WORKERS INITIATIVES TOWARDS GREEN WORK ENVIRONMENT**

1. Workers can take steps to reduce of waste materials like papers, cups, pen etc.,
2. Build the behavior switched off all PCs and when ever not tin use especially at night time
3. Cheering workers to be more environmentally
4. Make a use of power resourceful light bulbs like solar
5. Determine power utilization (electricity and gas)
6. prohibit on desk – sides bins , replaced by common recycling that is keep central dustbin for everyone 's usage purpose
7. Obligation to electronic filing only



## **How can we have interaction our employees and alter behaviour?**

Only few employees found to switch off their cabin lights before leaves to home. Most of the employees were follows environmental policy of the company. Majority of the employees shut down their PC once complete their works. Majority of the employees agreed that their management is taking lot of steps to sustain their green working environment. Majority of the employees are follows green working culture in their working place.

The scope of our work is broad and that we recognize it'll step by step become additional challenging for America to still build more environmental enhancements. As we seek further amendment we'd like to interact our employees in additional artistic and innovative ways that. Before parking with employees the management would like to create proper clear information to send. Generally, though, our employees cannot act if they are doing not have clear messages right from the top of the organisation through to their line managers to inform them that environmental management must be a part of everyone's higher cognitive process. This isn't simple and that we haven't absolutely achieved this nevertheless. the very fact that our internal setting strategy is one amongst solely 10 sub methods of the setting Agency's company arrange shows our commitment thus we have a tendency to use it as a lever to urge additional attention.

## CONCLUSION

Hence we conclude that there is consent among everyone that we are in global warming era and activities of human is a crucial cause of this occurrence. It is an essential part of every employer and employee to keep their green working environment and create sustainability of environment. Environmental sustainability endeavor to enlarge the welfare level of people by defending raw material resources that are used to meet personal needs, and also by preventing various effects resulting from the creation of waste. It would be better if the management clearly defines their employees about strategy to maintain green work place and environment sustainability policy.

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## Women Entrepreneur transforming the food market

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### ABSTRACT

*"Way to a Human's heart goes from its stomach." This sentence has always been a part of Indian Traditions and values. Food industry is something which has always played very crucial part in busy life's of the millennials. Food tech has changed the purview of millennials in regards to how and what they eat. With current rate of growth food industry in India will soon become major contributor to global food market.*

*Women account for the vast majority of food-purchasing decisions in India, The phrase "kitchen is women's best friend" needs to be reiterated as food tech industry supposedly has almost 50% female oriented work force. This paper presents, the study of contributions which female entrepreneurs have contributed to the food tech industry, from 'making food to making apps to get food delivered.*

*Keywords: Expanding opportunities, Indian Lifestyle, food industry, globalization*

### INTRODUCTION

In India there are three Sectors i.e. Primary, Secondary and Tertiary. India was agrarian economy. From Agrarian Economy India has shifted to Service sector because of globalization. Expanding opportunities for women outside agriculture, particularly by raising the level of education of women and by delaying the age of marriage, is crucial to countering these trends. In India Last two decades there has been drastic change in consumer food habits there are several economic developments, increasing spending power and opening to new diets and lifestyles habit, development of production, processing, distribution and marketing has tremendous growth in India.

The Indian Lifestyle of eating has been changed tremendously. The food industry is a setting in which many such opportunities exist. Changes in supply, Changes in demand, Unfamiliar shocks policy makers recognized that food industry can contribute significantly to these goal.

Increase in Employment Rate an increasing proportion of women have moved to waged employment on large farms. In many cases they have replaced men who have moved to employment outside the agriculture sector as part of the agrarian transition. Women commonly face difficulties in reconciling responsibilities in the care economy—particularly the minding and educating of children of pre-school age—and employment on farms. Government are providing various subsidies so that women can shine and change the take the food market to another level.

### REVIEW OF LITERATURE

1. **R. GANESAN(2003)** in his study on Psychosocial profile of women entrepreneurs in processing enterprises carried his study on non-governmental organizational in Chennai and Bangalore named Moowes and Awake working for Working for Women Entrepreneurships development. 32 women were involved in the study. On the basis of the findings and study several policy were suggested. The study was mainly focused on the psychosocial aspects, but not on the economic aspects of the enterprise.
2. **S M D Maukar\*, F W Langitan, T F S Tangkere and A Dondokambe(2018)** in their study on Developing Traditional Food Service: A Portrait of Women in Culinary Industry. This study is related to catering service business and the traditional home industry of the small business. There is huge cooperation from government in funding Media plays a very important in educating a women and in developing of recipes and promotion of nutritious traditional foods
3. **Marilyn Sitaker, Jane Kolodinsky,Rebecca A. Seguin, Stephanie B.(2015)** in their study on local food system affordable foods sources for consumers and economically feasible structures for producers. They consider innovations for four factors 1. Producers to make a living 2. Improve local economies 3. Provide healthy food to local residents 4.contribute in local resident for healthy consumption. The middleman should be cut down so that the farmers should earn more profit

4. **Nurul Retno Hapsari1, Noeria Soeditianingrum1 (2018)** highlighted that women is always seen as a housewives picture i.e. placed in domestic work and caring for children. Women's are not compatible with business because they are not capable enough in making the decisions and they are not enough control on their emotions compare to the men. The study also highlighted the factors which affects the development of women such as cultural, family, external etc.

## OBJECTIVES

1. To understand how Indian food tech industry is working.
2. To study various vital roles women entrepreneurs play in food tech industry.
3. To understand various disciplines and techniques used by women entrepreneurs to transform food tech industry.
4. To offer suggestions for enhancement and conclusions for betterment of food tech industry.

## RESEARCH METHODOLOGY

The research is completely based on Secondary data which is collected through the published sources, Magazines, Journals, Newspapers, Books and Internet Sources.

## LIMITATIONS OF THE STUDY

1. The research study has limitation of time
2. The study is generalized and indicative

## CURRENT SCENARIO OF INDIAN FOOD TECH INDUSTRY

Food technology further referred as food tech is a branch of food science dealing with the production processes which makes food. Earlier the concept of food tech was more focused on inventions to food preservations.

Food Industry in India has segments like fisheries, plantation, fruits and vegetables and confectionery to name a few. Food Industry in India has grown over the last few years and it is expected to be worth more than US\$ 310 billion by 2015

More and more investors are interested in taking up plunge in this sector making food tech space a hot investment.

The investors and foodpreneurs are at large in a win-win situation when it comes to investing or expanding in food tech. creating a business out of a product that entails the millennials and is a necessity in a lot of ways is sure to produce profit and benefit

Currently, the Indian Food Services is a \$50 billion industry. It is less as compared to the other markets in the world, for example, the U.S. which is a \$200 million industry.

## PRESENCE OF WOMEN ENTREPRENEURS IN FOOD INDUSTRY

With a continuous boom food sector is now facing its share of contradiction between the leaders and the ones who are interested in further innovations. Women entrepreneurs account

For the vast majority of the work force responsible for the innovations in the food sector. From forming a technology to increase the yields in farms to change the face of food deliveries women entrepreneurs are playing pivotal role in food industry. Even with so many accolades women are underrepresented across the board above this level.

Despite this current state and the unknowns around the barriers to addressing gender inequity, the

Picture is not all bleak. There are sections within the food industry that are making great strides in increasing the representation of women. One need to highlight the success stories and spread those practices across the food industry.

## TECHNIQUES AND DISCIPLINE REFERRED BY WOMEN ENTREPRENEUR

1. Reinvent and elevate the experience- Making sure that we are understanding and catering to the guest needs is highly prioritise.
2. Authenticity with a reinvented twist- Reworking on authentic variety of foods and creating a wow factor for the guest

3. The ideologies of dhabas- Nothing matches the dhabas by a mom creating a similar kind of experience for an officer goers staying away from families
4. The idea behind ghost restaurant- An idea conceptualized by an **Indian Women Chef** of providing food prepared in her kitchen as a hotel food with the help of increasing technology and delivery apps this kind of business has reached new heights.
5. Go Organic- Growing organic fruits is an industry inside food industry like an having a universe itself. Organic fruits has great demands in Indian market and bringing in technique like this has helped in catering the market.

## SUCCESS STORIES

### 1. Pallavi Jayswal

With the culinary skills and the entrepreneurship this lady has received a title of Culinary Wizard in food industry her ideologies has given her the much deserved space in Indian food tech industry.

2. **Rashmi Daga:** She is founder of a food tech company called Fresh menu which has its own share of customers and provided innovated yet authenticate food to its customers. The Idea of dealing with Cloud Kitchens has taken her company to new heights.
3. **Dipti Motiani:** She is founder of a company cultivating fruits organically. Her idea of being fresh and organic has helped her to the one of the top suppliers of fresh Indian fruits in European super markets.

## SUGGESTIONS FOR ENHANCEMENT OF FOOD TECH INDUSTRY

The ever changing needs of consumer can be catered with ever changing innovations however in the urge of innovating we should stick to the core of the food industry which is the consumer preferences and safety. The techniques used by the women entrepreneurs deals mostly in innovating with a sense of authenticity which keeps the soul of the food intact, thus helps the customer to repeat and elevate at the same time.

## CONCLUSION

Even though the food industry is growing the stereotypes of women not getting proper accolades need to change, as women has always played a vital role in the transforming the Indian food tech industry with applications like freshtrop and fresh Menu the apps created by women 'foodpreneurs' are gaining importance due to their true to core ideologies and heartfelt innovations.

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## Health Risk Predictor: Reducing the cases of chronic illness using artificial intelligence and machine learning

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### ABSTRACT

*India is facing an alarming problem of an increasing number of chronic and lifestyle-related conditions like diabetes, hypertension, thyroid, obesity, etc. The problem is multi-fold; it is not only increasing numbers but also a lack of awareness about the condition that otherwise can help people to keep the problems at bay. The major cause of these conditions is the inability to identify early warning signs and take essential corrective measures to curb it.*

*This research paper presents the concepts of artificial intelligence to ameliorate this burgeoning problem. It does by building a health profile of an individual using data from relevant sources like IoT devices (Smart Watches, Sleep Tracker). Based on the health profile built over a period of time an anomalous behaviour will be flagged with the help of artificial intelligence and machine learning techniques. Thereby, alerting the individual, at a very early stage, about the probability of developing a serious health condition in the future.*

**Keywords:** Chronic Illness, Artificial Intelligence (AI), Machine Learning (ML), Anomaly Detection

### 1. INTRODUCTION

According to a nation-wide study, 1 in 2 Indians are unaware of their diabetic condition and 1 in 4 manage to bring it under control once detected. [Benita Chacko (2019, July 9) <https://www.indiaspend.com/1-in-2-indian-diabetics-unaware-of-their-condition-study/>] The numbers are similar for hypertension, another chronic condition where 1 in 2 are unaware, only 1 in 7 take blood pressure lowering medication and less than 1 in 10 can achieve any control over it. [Sushmi Dey (2019, May 14) <https://timesofindia.indiatimes.com/india/as-hypertension-prevalence-rises-50-of-indians-are-unaware-of-diagnosis-study/articleshow/69316127.cms>]

Although there have been enormous efforts to bring this under control, India continues to be the 'diabetes capital'. The most worrying aspect of the problem is that the Indian population is ignorant about the lifestyle choices that can easily lead to such conditions. The situation worsens at inaccessible and remote areas where there is a lack of medical support. It has no more been an old age problem and has widely spread across all age groups, which is evident from the rising number of pre-diabetes cases among children.

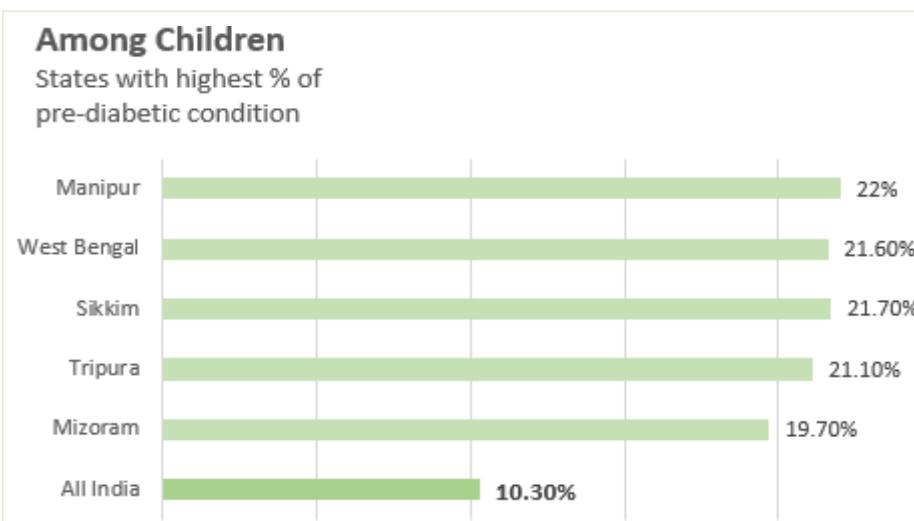


Figure 1: State-wise percentage of the pre-diabetic condition amongst children.

(Source: Indulekha Aravind (2019, Nov 10)

<https://economictimes.indiatimes.com/industry/healthcare/biotech/healthcare/why-india-should-seriously-give-attention-to-overweight-diabetes-problems/articleshow/71985695.cms?from=mdr>

The numbers are daunting and signify an unhealthy future generation. Now is the time when we start putting our entire wherewithal to combat the Goliath. There has already been tremendous efforts on the importance of following a disciplined lifestyle with good eating habits supplemented with a balanced exercising regime. However, it has not generated the desired outcome as can be seen by the rising numbers. Hence, it has become imperative to use technology to its potential in curbing this menace.

The recent developments in artificial intelligence and machine learning has made something that was unimaginable a few years back, realistic. It has proven to be a boon in the health care industry with various real-time applications like AI-based virtual physician, next generation radiology tools, containing the risk of antibiotic resistance, early cancer detection and much more. Similarly, if harnessed in the right way, artificial intelligence and machine learning can help in identifying the onset of such chronic conditions and measures to take corrective action to reverse it.

## 2. PROPOSITION

The idea is to develop a true health profile of an individual based on his or her collected data. By using artificial intelligence and machine learning, our solution can map an individual's choices in real-time to existing trajectories. It can determine how an individual is following a unique path along a chronic condition and plan the interventions accordingly.

The solution will provide a health risk score on periodic basis, which is a standardized metric signifying the probability that a person will develop a chronic condition. It keeps a check on an individual's health literacy, lifestyle choices, and atypical habits to prevent the development of a more serious condition, which could lead to unprecedented outcomes and higher spending in the future. The only way to prevent the chronic condition is to be proactive rather than reactive.

## 3. DATA SOURCES

The machine-learning model that will be the brain of the solution heavily relies on the proven historical data and real-time capture of an individual's records. It is not only limited to electronic health records but also includes sources like social and environmental factors and genetics. Hence, the challenge is to identify all the relevant data sources, check the quality of the data captured, normalize the data according to the population and transform it into a format that can be fed to the machine learning algorithm to generate desired outcomes.

The data required can be broadly classified into the following areas:

Demographics	Social and Environment Factor	Medical Information
Age	Employment status	Patient's vital signs
Gender	Transportation	Laboratory results
Home/Work Location	Climate	Historical illnesses
Travel History	Language	Hospital admissions
Income	Hunger and access to food	Medical records
Literacy	Social integration & Safety	Allergies

Figure 2: Classification of relevant data sources to be used

(Source: Jennifer Bresnick (2018, Jan 02) <https://healthitanalytics.com/news/identifying-big-data-sources-for-population-health-management>)

The most fundamental and critical aspect is obtaining an individual's health data. With the advent of IoT devices, capturing and tracking vital and real-time information about an individual has become were easy. There are number of wearables and home monitoring equipment embedded with IoT that can help the individual keep track of their health choices effectively. Two examples of such devices –

### 3.1 SMART CONTINUOUS GLUCOSE MONITOR (CGM)

A Continuous Glucose Monitor (CGM) [Econsultancy (2019, Feb 01) <https://econsultancy.com/internet-of-things-healthcare/>] is a device that helps diabetics to continuously monitor their blood glucose levels for several days at a time, by taking readings at regular intervals. The US Food and Drug Administration (FDA) approved the first CGM system in 1999, and in recent years, several smart CGMs have hit the market.

### 3.2 WEARABLE DEVICES

Wearable devices [Wikipedia, [https://en.wikipedia.org/wiki/Wearable\\_technology](https://en.wikipedia.org/wiki/Wearable_technology)] like smart watches can measure and track most of the vital signs of an individual like heart rate, calories, sleep quality, and steps count. The data thus captured can be normalized and fed into the model.

The data recorded can be classified into two types – static and dynamic. Static data is the demographics data, which remain constant for an extended period. Its frequency of change is very high (in years) and hence, considered constant. On the contrary, dynamic data like the number of steps in a day, calorie intake, and pollution level, etc. keep on changing frequently and is also dependant on external factors and hence prone to frequent changes.

### 3.3 MEDICAL HISTORY & GENETICS

A person's medical history and genetics can help determine an individual's future health. Hence, digitizing the individual's along with the family's medical records will be a crucial data source for the model. It will also make the model more accurate in terms of giving a health risk score based on medical history.

## 4. MACHINE LEARNING MODEL

The machine learning technique that will be used for building the individual health profile and flagging any unusual behaviour is 'Semi-supervised Anomaly Detection'. The training data for such a technique will be a blend of static and dynamic data, which will be rigorously fed into the model. A schematic representation is depicted below –



Figure 3: Semi-supervised anomaly detection uses an unlabelled data for training. Any deviations from training data is flagged in test data.

(Source: (Wikipedia, [https://en.wikipedia.org/wiki/Anomaly\\_detection](https://en.wikipedia.org/wiki/Anomaly_detection))

The advantage of using such a technique is it learns and updates itself as more and more data is fed into the model. Besides, it adapts itself to the changing lifestyle, habits, and demographics, social and environmental conditions of an individual. It is good at correlating and understanding dependencies between features and does not flag decreased physical activity with increasing age.

There are two types of anomaly in general, local and global anomaly. For simplicity purposes, let us consider only two dimensions (X & Y) of the data as shown below.

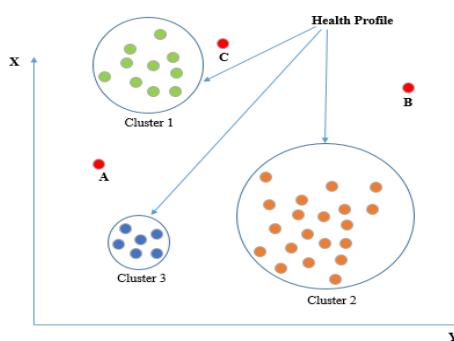


Figure 4: Simple 2-dimensional representation. It has global anomalies (A & B) and local anomaly (C). 3 clusters signifying healthy and habitual lifestyle choices

In the profile shown above, incidences A and B can be considered as global anomalies. For instance, individuals drinking alcohol for the first time will be flagged as completely anomalous behaviour. On the other hand, instance C can be considered as a local anomaly with respect to cluster 1, signifying an irregular sleeping pattern of the individual.

There are a number of anomaly detection algorithms to model this behaviour. The type and number of algorithms used will depend upon the data and that gives desired outcomes with the least false positives. The algorithms can be broadly classified as:

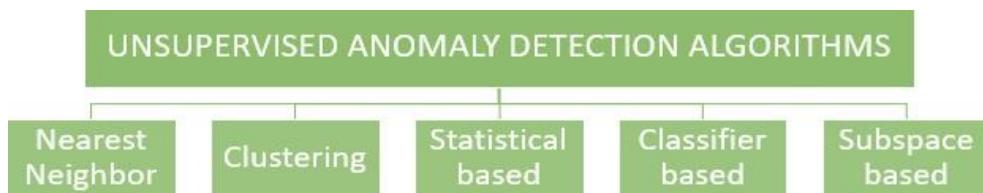


Figure 5: Classification of Algorithms

(Source: Jing Gao, [https://cse.buffalo.edu/~jing/cse601/fa12/materials/outlier\\_detection.pdf](https://cse.buffalo.edu/~jing/cse601/fa12/materials/outlier_detection.pdf))

Each of these algorithms is designed to identify a pattern and detect a specific type of anomaly and hence, an ensemble methodology, which uses a combination of these algorithms as strong and weak learners, will be useful in capturing different types of anomalies.

## 5. ADVANTAGES

1. The most important benefit of the solution is early detection and intervention for chronic illnesses. Thereby, improving health literacy and reducing the overall number of cases.
2. As the solution matures and learns on more data, it can be enhanced to incorporate an upcoming medical condition like the failure of an organ.
3. It will also help the individual reduce the unexpected and exorbitantly high medical expenditure at old age
4. At present, a physician only has a limited amount of information about the patient when he or she visits the doctor like blood pressure and other vital signs. This solution can put up the patient's entire profile in front of the doctor so that it can be known if the patient is at a risk for stroke, coronary artery disease or kidney failure.
5. It helps health care professionals provide each patient with a tailored treatment to target a specific problem rather than adopting general treatment targeting common symptoms
6. The solution has the capability to improve the overall health of the nation.

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## Bank Financing to MSMEs in Kerala

Dr. Binija George\*

### ABSTRACT

The Small Scale Industries Sector, redefined since 2006 as the Micro Small and Medium Enterprises Sector has played a seminal role in the growth of the Industrial and Services Sectors in India. MSMEs have contributed significantly to employment generation, balanced regional development, export promotion, development of a vast ancillary base for large scale industries and above all creation of opportunities for weaker sections of society and women leading to their empowerment, which is essential for achieving an inclusive growth. MSMEs have a significant role to play in the industrial development of Kerala. MSMEs have the ability to innovate and experiment with new technologies on small scales. But lack of finance is the major hurdle for their development. In this context, this paper tries to examine the various financial assistance provided by commercial banks to MSMEs.

**Key Words:** MSMEs, Bank, Financial assistance, weaker section, employment generation

### INTRODUCTION

The MSME sector has been considered as a vibrant and dynamic sector in the industrial scenario of India and the sector acts as an engine for the economic growth of the country by means of its contribution towards employment generation, export earnings, production and assisting in satisfying the requirement of medium and large scale industries. Kerala, with its excellent connectivity, communication network, availability of skilled human resources and relatively good industrial infrastructure, is highly suited for the growth of the MSME sector. The Micro, Small and Medium Enterprises (MSME) sector is fast emerging into a major income generating and employment providing sector in Kerala with relatively lower investment. As per the MSME 4th Census 5.62 per cent of all India share of MSME enterprise is in Kerala. MSME sector can lead the State economy by increasing exports through quality production techniques and products. In Kerala, Government and banks are providing lot of facilities for MSME Sector.

**Table-1: Definition of the Micro,Small and Medium Enterprises**

Enterprise(Type)	Investment in Plant&Machinery(Manufacturing)	Investment in Equipment(Service)
Micro	Up to Rs.25 lakh	Up to Rs.10 lakh
Small	Above Rs.25 lakh& Upto Rs.5 crore	Above Rs.10 lakh &Upto Rs.2 crore
Medium	Above Rs.5 crore&Up to Rs.10 crore	Above Rs.2 crore& Up to Rs.5 crore

(Source: Micro,Small and Medium Enterprises Development(MSMED)Act,2006

### OBJECTIVES OF THE STUDY

- To study the performance of MSME Sector in Kerala
- To identify the credit flow to the sector by commercial banks
- To identify the measures taken by RBI to ensure adequate credit flow to the sector

### METHODOLOGY OF THE STUDY

The present study is based on the data obtained from both primary and secondary sources. The primary data has been collected from the MSME entrepreneurs through direct interview with them. The secondary data has been collected from published and unpublished annual reports, Government manuals/orders, websites, journals,magazines etc.

### Micro,small and Medium Enterprises Development Act,2006

MSMEs not only play crucial role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in industrialization of rural and backward areas,there by reducing regional imbalances,assuring more equitable distribution of national income and wealth. Being cognizant about the crucial role of MSMEs, government enforced MSMED Act,2006 which redefines the meaning of MSMEs.

**Table-2: Performance of MSME Sector in Kerala during the period 2006-07 to 2015-16**

Year	Number of Units	Total Investment(Rs. in lakh)	Production(Rs. in lakh)	Employment(Nos.)	*Export(Rs. In Lakh)
2006-07	12348	514235.69	71575	48593	15690.92
2007-08	11174 (-9.50)	334470.98 (-34.95)	588100.13 (721.66)	108873 (124.05)	17691.15 (12.74)
2008-09	14743 (31.94)	343903.8 (2.82)	132155.38 (-77.52)	97304 (-10.63)	16375.95 (-7.43)
2009-10	12081 (-18.05)	529522.35 (53.97)	255894.6 (93.63)	81368 (-16.38)	18121.45 (10.65)
2010-11	10890 (-9.86)	515753.2 (-2.60)	478669.81 (87.05)	81954 (.72)	16920.73 (-6.62)
2011-12	10389 (-4.6)	738452.73 (43.18)	584985.34 (22.21)	72324 (-11.75)	20569.70 (21.56)
2012-13	13051 (25.62)	969906.41 (31.34)	621424.55 (6.22)	81467 (12.64)	21972.43 (6.82)
2013-14	14997 (14.91)	844924.68 (-12.89)	676514.39 (8.86)	87789 (7.76)	24282.95 (10.52)
2014-15	15455 (3.05)	928437.94 (9.88)	711975.39 (5.24)	83501 (-4.88)	23082.22 (-4.94)
2015-16	18917 (22.40)	860287.47 (-7.34)	396982.49 (-44.24)**	119683 (43.33)	23982.98 (3.90)
<b>CAGR</b>	<b>4.85%</b>	<b>5.88%</b>	<b>20.96%</b>	<b>10.53%</b>	<b>4.83%</b>

Source: Directorate of Industries and Commerce, Thiruvananthapuram, From 2015 Sept. 18<sup>th</sup>, the system of MSME registration has been switched over to Udyog Aadhar. (The figure in brackets show the percentage growth over the previous years)

\*Source: Cochin Port Trust

\*\* Production in 2015-16 is only upto sept.15<sup>th</sup> 2015.

## Interpretation

From the table 2, it is clear that the total number of MSMEs in Kerala have increased from 12348 in 2006-07 to 18917 in 2015-16. The compound average growth rate (CAGR) is 4.85 percent.

The above table depicts the total investment in the MSME Sector from 2006-07 to 2015-16. During the period the investment in fixed assets has increased from Rs. 514235.69 lakh to Rs. 860287.47lakh with significant CAGR of 5.88 percent.

The value of production of MSMEs has grown at the CAGR of 20.96 percent during the period of 2006-07 to 2015-16. The production in 2006-07 is 71575 and the amount in 2015-16 is 396982.49(amount is only up to 15<sup>th</sup> sept.2015).

The data relating to growth of employment show that the MSMEs played a significant role in the employment generation during the period 2006-07 to 2015-16. The total number of employment generated during the period of 2006-07 was 48593 and it's reached to 119683 in 2015-16 at the CAGR of 10.53 percent.

The export data indicates that MSMEs Sector in Kerala play an important role in the promotion and development of the state. The production of this sector for export has grown at the compound rate of 4.83%. The export of MSME Sector in Kerala during 2006-07 was Rs.15690.92 lakh and it has reached to Rs.23982.98 lakh in the year 2015-16.

## REVIEW OF LITERATURE

**Agarwal (1987)** in his article entitled “Bank Financing of Small-Scale Industries in India”, describes that the Indian banking system has failed to provide adequate amount of loan to SSIs.. He is of the opinion that banking

institution should be more practical and flexible in their attitude rather than strictly legal with a view to enabling the borrowing units to overcome any temporary difficulties.

**Prasad (2006)** in his article entitled “Micro, Small, and Medium Enterprises Financing in India-Issues and Concerns”, concluded that the flow of institutional finance is linked with the creditworthiness of the enterprise. Small Enterprises due to their size and low capital base, generally find it difficult to satisfy the conditional lay down by the Public Sector Banks, particularly in establishing the viability of the project, meeting collateral requirements and making timely repayment of loans.

### BANK CREDIT TO MSME SECTOR.

Banks are said to be agents of social transformation. To meet this end Reserve Bank of India devised many plans for the development of this priority sector. RBI issued a master circular with the enactment of MSMED Act 2006, to all Scheduled Commercial Banks stating that the bank loans to micro and small enterprises, both Manufacturing and Service are eligible to be classified under Priority Sector advance and provide direct finance to manufacturing enterprises, loans for food and agro processing, Service Enterprises, Export Credit, Khadi and Village Industries Sector (KVI) and rehabilitation of sick Micro and Small Enterprises. Public sector banks have been advised to open at least one specialised MSME branches in each district for lending to MSME Sector.

**Table-3: Outstanding Advances to MSME Sector by Commercial Banks in Kerala(Amount in Crore)**

Sl.No	Year	Amount of Credit	Growth Rate(in %)
1	2008	6674	
2	2009	8095	21.29
3	2010	11758	45.25
4	2011	16894	43.68
5	2012	20593	21.89
6	2013	23563	14.42
7	2014	32069	36.09
8	2015	35730	11.41

Source: StateLevel Bankers' Committee Kerala

A primary survey was conducted among the entrepreneurs (50 units) in Malappuram district to know about their opinion and awareness about the facilities available for them in the case of bank finance. It was surprising that 60 percent of the respondents were not aware of these facilities .80 percent of the entrepreneurs were not interested in bank finance due to its lengthy formalities and procedures. Out of 40 percent of the entrepreneurs who had availed the loan facility, 20 percent had availed overdraft facility and the remaining 20 percent had availed term loans from commercial banks. It can be very well inferred from the survey that while commercial banks very well supported the established firms at every stage , they are reluctant to support young entrepreneurs coming forward with a viable project. The banks are not ready to compromise in the case of collateral security that they demand for the loans they provide. The commercial banks in the state are not ready to take any risk which may affect their profitability.

**Table-4: Small Industries Development Bank of India's Assistance to Small Scale Industries**

Year	Sanction and Disbursement				Performance of Kerala as % of All India	
	All India		Kerala			
	Sanction	Disbursement	Sanction	Disbursement	Sanction	Disbursement
1	2	3	4	5	6	7
2001-2002	9026	5919	313	289	3.47	4.88
2002-2003	10904	6789	614	214	5.63	3.15
2003-2004	8246	4414	162	133	1.96	3.01
2004-2005	9091	6188	221	142	2.43	2.29
2005-2006	11975	9100	497	457	4.15	5.02
2006-2007	11102	10225	773	739	6.96	7.23
2007-2008	16164	15087	833	778	5.15	5.16
2008-2009	29188	28298	1043	912	3.57	3.22

2009-2010	35521	31918	316	263	.89	.82
2010-2011	42195	38796	1405	768	3.33	1.98
2011-2012	43174	41160	2054	2048	4.76	4.98
2012-2013	40961	40520	1203	1200	2.94	2.96
2013-2014	52826	52191	400	100	.76	.19
2014-2015 (as on 30.09.14)	23319	23120	26	28	.11	.12

Source: Small Industries Development Bank of India(SIDBI)

## FINDINGS OF THE STUDY

- The number of Micro, small and medium enterprises in Kerala registered a growth in the same period. It increased from 12348 in 2006-07 to 18917 in 2015-16.
- The employment generated by the MSMEs has also increased from 48593 to 119683 over the same period.
- In Kerala, the disbursement of assistance is less than that of sanctioned assistance. This may be because of the various procedures involved in providing assistance to MSMEs.
- The commercial banks in the state are not ready to take any risk which may affect their profitability.

## CONCLUSION

It is important to say that lack of adequate finance is the most important problem faced by MSME Sector. Among the Financial Institutions, Commercial banks are providing largest credit to the MSME Sector and as a result, RBI has taken appropriate measures to ensure adequate and timely credit flow to MSME units. It is an important fact that small entrepreneurs like to get finance from their family, neighbours or money lenders in their locality. They are reluctant to approach banks for their needs because of the lengthy formalities of the banks in availing the finance. So it is the duty of the bankers to provide not only loans but also to educate and train the entrepreneurs about the benefits and facilities available for them. In short, It is found that inspite of the guidelines given by Reserve Bank of India, neither the units are aware of the facilities open for them nor the commercial banks are following it.

## SUGGESTIONS

- Most of the entrepreneurs depend upon the commercial banks for their financial requirement. Hence banks should be encouraged to liberalise the complex procedures involved in sanctioning the loans to MSMEs.
- The MSM entrepreneurs should be educated about the various type of assistance provided by banks to their units.

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## A Study on the Major Phenomenon Surrounding Biometric Authentication in E-Learning

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### ABSTRACT

Though biometric systems have been successfully engaged in a number of real-world applications, they are error prone. The challenge is to develop a biometric system that is highly accurate and secure, convenient to use, and easily scalable to a large population. Systems that have the ability to authenticate persons accurately, rapidly, reliably, cost-effectively, friendly to use, and without drastic changes to the existing infrastructures are desired. Despite rapid growth in bio-metric systems, in the past few decades, a number of core research issues have not yet been fully addressed. The deployment of online e-learning can lead to many security risks, such as confidentiality loss, exposure of critical data, availability and destruction of publicly available information services. Security and proper authentication is critical in any online learning environment because any flaws can affect perceptions of its trustworthiness. In this chapter, different issues and challenges in designing biometric-based security systems and methodologies involved in overcoming these issues are discussed. Many researchers developed biometric-based security system despite that many challenges remain unaddressed. Only few challenges are addressed completely; still, there is a requirement of robust algorithms. In this chapter, we propose two approaches of feature extraction, i.e., block sum for iris and modified minutiae method for fingerprint. The main aim of this chapter was to provide an informative analysis and solutions of key issues and challenges of biometric-based security system.

**Keywords:** Biometric system, Security, Iris, block sum, authentication, E-learning.

### 1. INTRODUCTION

It is expected that authors will submit carefully written and proofread material. Spelling and Biometric authentication is increasingly being used in the newer generation of online learning environments for authentication of remote learners. Biometrics scan unique physiological characteristics in humans to identify people. These include fingerprints, iris, retina, voice, face, gait, and odor. The authors look at the state of biometric authentication techniques applicable to online learning environments and provide a more in-depth examination of face and iris based authentication systems for proper identification of learners.

Access control, according to Raymond Panko, is the “policy-driven control of access to systems, data, and dialogues.” For any given situation or device, there are a number of methodologies that can be used to provide access control including physical barriers, passwords, and biometrics. As such, it is important for the management faction of security to develop a policy that delivers oversight and guidance to the application of access control to a given process. Biometric security is the “method of identifying unique human characteristics as a mean of authenticating an individual’s identity”. Ultimately, biometric security measures focus on the examination of unique biological traits and then compare the examined data against an already compiled database of cleared individuals. The following are all methods that can be utilized for biometric authentication: DNA Matching, Ear Shape, Iris Recognition, Retina Recognition, Facial Recognition, Fingerprint Recognition, Finger Geometry Recognition, Gait Recognition, Hand Geometry Recognition, Olfactory Recognition, Signature Recognition, Typing Recognition, Vein Recognition, and Voice Recognition (Biometric Institute Limited, 2013). I will also discuss installation, usage, and possible errors or issues that may arise with biometric authentication use. The next section of the paper will be devoted specifically to the employment of biometric authentication systems. Within that section I will focus on the following three methods: facial recognition, voice recognition, and fingerprint recognition. This section will also include problems that may arise as well as a comparison to traditional password authentication systems. Finally, I will reach a conclusion on which authentication technology, biometric or password, will provide the better security. Multi biometrics system design is certainly a challenging task since it is very difficult to choose the best possible sources of biometric information and fusion strategy for a particular application.

### 2. LITERATURE REVIEW

Biometric authentication is a security process that relies on the unique biological characteristics of an individual to verify that he is who he says he is. Biometric authentication systems compare a biometric data capture to stored, confirmed authentic data in a database. If both samples of the biometric data match, authentication is confirmed. Typically, biometric authentication is used to manage access to physical and digital resources such as buildings, rooms and computing devices. Biometric authentication is a form of security that measures and matches biometric features of a user to verify that a person trying to access a particular device is authorized to do so. Biometric features are physical and biological characteristics that are unique to an individual person and can be easily compared to authorized features saved in a database. Biometric authentication is simply the process of verifying your identity using your measurements or other unique characteristics of your body, then logging you in a service, an app, a device and so on. Biometric recognition (also known as biometrics) refers to the automated recognition of individuals based on their biological and behavioral traits. Examples of biometric traits include fingerprint, face, iris, palm print, retina, hand geometry, voice, signature and gait.

### 3. BACKGROUND AND DESCRIPTION

An enhanced authenticated system is currently playing a no small role in the current human experience. Over the years, the demand for enhanced authentication system has increased astronomically, due to the number of internet and online users. Unfortunately, the insecurity coupled with un-authentication for individual and that of the organization's data has equally increased. These have paved way for an unauthorized person to gain access to individual as well as an organization's data. User authentication is the only way to prevent the unauthorized access to a system. Biometric Authentication in E-Learning provides innovative insight into biometrics as a strategy to mitigate risk and provide authentication, while introducing a framework that provides security to improve e-learning, including but not limited to on-line examination by using biometric based authentication technique.

#### 3.1 E-LEARNING

E-learning refers to a learning system that we can obtain through the internet using an electronic device. We also call it online learning or online education. The 'E' in E-learning stands for 'Electronic.' Hence, the original term 'electronic learning.' E-learning platforms. People can do an online course via a wide variety of different platforms, such as:

- MOOCs (Massive Online Open Courses), e.g. Coursera or Futurelearn.
- Virtual learning environment (VLE), such as Learn or Blackboard.
- Video streaming services, such as YouTube.
- Virtual instructor-led training (VILT), e.g. WebEx or webinars.
- Discussion boards.
- Podcasts.
- Forums.

E-Learning is learning by utilizing electronic technologies to access educational curriculum outside of a traditional classroom. Increasing threat from authorized persons is posing a serious danger to e-learning, hence the need to fortify networks system including the internet with biometric authentication so as to ensure data safety, integrity and availability as far as e-learning is concern. The process of installing and utilizing a biometric authentication system for security purposes is relatively simple. First, the system must be installed and be allowed to scan each individual that will be allowed access through the security checkpoint to be scanned. This is typically referred to as an enrollment scan. According to Raymond Panko, author of Corporate Computer and Network Security, enrollment scans gather an extraordinary amount of data, and this data can and will be different each time an individual scans their appropriate biological part. The scanner will actually search the data for specific key features which can be used to consistently and repeatedly identify the user. This information is then stored in the user's template. Now that the user has been scanned into the database, any future entry scan, called a supplicant scan, will once again search the incoming data for key features which are compared to the key features already stored in the database. While the process may seem relatively straight forward, in actuality several more steps are generally performed within the enrollment scanning stage. The key features, or match points as Jangra and Goel refer to them, are "processed using an

algorithm into a value". This value is then used to compare with the value created from processing the applicant scan.

When utilizing any authentication system, there are two errors that must always be weighed against each other as they are inversely proportional: false acceptance rates and false rejection rates. A false acceptance occurs when the individual being scanned is incorrectly matched to an existing user's template. A false rejection occurs when the individual being scanned is not matched with their existing user template. It is important to understand from a security standpoint, as I stated before, these two rates are inversely proportional. This means that when one rate drops, the other will rise.

For example, suppose that as the head of security you wish to see an entry point's false rejection rate subside due to user complaints of inconvenience. So the authentication system has its algorithm adjusted. As a result of the adjustment, the false rejection rate has gone down, but because of the allowance for less exact matches, the false acceptance rate will now increase. This increase will potentially compromise the security system. As can be seen from the above information, biometric authentication systems offer a unique method of authenticating users attempting to access both secure areas and devices.

## 4. AUTHENTICATION DEVICES USED IN BIOMETRIC SYSTEM

### 4.1 Facial Recognition

Facial Recognition is a fast growing area of interest in biometric authentication system realm due to the ease of use. Nearly every system including cell phones today features both a front and screen facing camera that costs relatively little. Facial Recognition is performed using either 2D Recognition or 3D Recognition. 2D Recognition uses a feature based approach. A camera captures the image of the face and "extracts distinctive facial feature points," such as the eyes, lips, nose, etc. An algorithm is then used to calculate geometric relationships between the distinctive points. 3D recognition uses an algorithm to determine the face's surface geometry. This amount is then compared to any stored templates.

Unfortunately, both methods have their drawbacks. 2D Recognition suffers from external factors like background and pose, while 3D Recognition is impacted by facial expression. Xi states that there are currently three other methods being created but are still in their infant stages; 2D Image Based, 3D Image Based, and 2D + 3D Based. Each approach utilizes the strengths of both 2D and 3D Recognition, but is relatively untested outside the lab. Overall Facial Recognition offers an inexpensive method for biometric authentication system

### 4.2 Voice Recognition

Voice recognition, like facial recognition, is another common feature found on today's systems. Voice recognition examines a number of physiological characteristics through a method known as Automatic Speaker Recognition (ASR). ASR uses an algorithm to process distinct features in high-level and low-level portions of the voice patterns. High-level features can determine dialect and speaker style, while low-level features help determine spectrum. Of the two, low-level features are the ablest in providing consistent recognition because high-level features can change with emotional states (Shuo Wang and Jing Liu, 2011)

### 4.3 Fingerprint Recognition:

Fingerprint biometrics, according to Xi, are the most widely used biometric feature because of their ease of accessibility, distinctiveness, persistence. Fingerprint recognition systems work by examining a finger pressed against a smooth surface. The finger's ridges and valleys are scanned and a series of distinct points, where ridges and valleys end or meet, called minutiae. These minutiae are the points the fingerprint recognition system uses for comparison. Fingerprint comparisons are extremely difficult to perform because of so many possible variations.



Fig I: Fingerprint Recognition

#### 4.3 Iris Recognition

Iris recognition is one type of bio-metric method used to identify the people based on single patterns in the region of ring-shaped surrounded the pupil of the eye. Generally, the iris has a blue, brown, gray or green color with difficult patterns that are noticeable upon close inspection. Please follow the below link to know more about iris recognition technology.



Fig II: Iris Recognition

#### 4.4 Signature Recognition

Signature recognition is one type of biometric method used to analyze and measure the physical activity of signing like the pressure applied, stroke order and speed. Some biometrics are used to compare visual images of signatures. Signature recognition can be operated in two different ways, such as static and dynamic. In static mode, consumers write their signature on paper, digitize it through a camera or an optical scanner. This system identifies the signature examining its shape. In dynamic mode, consumers write their signature in a tablet which is digitized, which obtains the signature in real-time. Another option is gaining by means of stylus-operated PDAs. Some biometrics also operate with smart-phones with a capacitive screen, where consumers can sign using a pen or a finger. This type of recognition is also known as “on-line”.



Fig III: Signature Recognition

## 5. CONCLUSION

We provide here an over view of security in online learning environment which are by their nature, subject to many of the attacks that standard online systems are vulnerable too. Although e-learning provides the e-learning opportunity of an anytime and anywhere learning environment with easy access to the internet, many security issues have to be considered. Among these issues, e-examination needs a personal authentication that guarantees the individual who takes the examination is the right person. The future implementation of the combined biometrics of brain wave and eye tracking will go long in a way to solving e-learning challenges. The p300 signal can also be used as a reliable observing method for identifying each person under e-learning environments. We need more experiments to verify the reliability of the proposed system, but harnessing advanced information devices along with developing effortless way to implement a brain wave detection system may provide a better security system for e-learning. E-Learning has come to stay, it therefore necessary on our part to safeguard the system with access control mechanisms relative to biometric authentication, so as to ensure the system integrity.

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## Wearable Band for detecting depression condition using Neural Network

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### ABSTRACT

The paper proposes a wearable band just like the band used which are very popular in today generation for tracking fitness. It has sensors which records the heart rate and the motion sensors for detecting the movement of the individuals. The data from these two important factors will be traced and recorded in the backend which will be on server. The server will store the data in the forms of numbers. The gathered data will be fed inside the algorithm based on neural network. The algorithm will calculate a graph based on the data gathered and would indicate a priority number. This number will indicate the level of depression a person is suffering from. The system will also have messaging sending mechanism to send messages to the victim's friends or to the one who is closed to the individual if the priority number crosses a certain value.

*Index Terms— depression, wearable band, algorithm, neural network*

### 1. INTRODUCTION

Depression is a state of mind where a person loose interest from the activities which he used to enjoy, a feeling of sadness and grief always surrounds him with negative thinking. A person loose hopes and in severe cases can get suicidal thoughts or can commit suicide. The proposed paper wants that the people to have an alternative to resorting medicines in case of depression. They wearable band provides them with a self-managing system to track symptoms of depression and get out of it. World Health Organization (WHO) estimates that depression occurs in 7% of the elderly population globally, whereas, in India, 25% of old population is suffering from it [13]. The paper aims to track the early symptoms of depression using a wearable device. The algorithm that runs in the back ground is based on neural network that takes inputs based on the data provided by the device. The algorithm will prioritize the level of depression a person is going through so that he can be provided with help and fatal consequences can be avoided

### 2. SYMPTOMS OF DEPRESSION

The most common symptoms identified in the papers are as follows:

- Sad mood: A kind of hollow feeling surrounds the person every time. They always feel sad and low with no concrete reason. They sadness may some time come out in the form of irritability in front of they closed ones.
- Loss of appetite: Person stops eating or in some cases person eats more than the usual amount.
- Insomnia or hypersomnia: A person with depression finds it difficult to sleep. They are surrounded by thoughts which makes them unable to sleep while lying on the bed. In some cases people sleep more than the usual requirements.
- Concentrating issues: They start finding difficulty in focusing on some activities. Thinking and concentrating on daily activities for completion becomes difficult for them.
- Feeling of Hopelessness: they loss self confidence and self esteem. They get negative thoughts which makes them feel their life is worthless and hopeless. These thoughts if not controlled can lead to an extend where the person can cause harm to himself or suicide.

A person starts looking dull, quiet, lose interest in daily activities, does not eat properly make and end up sleeping more in day time and stay awake at night time or is frequently absent from work and always stay alone in their room. Such signs indicate that the person may be suffering from depression. Depression is a common mental disorder with a set of symptoms that affect a person's thoughts, feelings, behavior, relationships, performance at work, and in very severe cases, may also lead to thoughts of suicide and death. It is alright to feel low or unhappy on certain stances. if this feeling persists for than two weeks or frequently occurs, then it could be a sign of clinical depression, which requires treatment.

The paper proposes a wearable band which is based on the technique to monitor the heart beat of a person based on it an analysis is done to predict if the person is going through depression or not.

### 3. WORKING PRINCIPLE

Technology based devices plays an important role in everyone's daily life. It is only thing that spends maximum time with any individual. Based on this health-based devices and technology are becoming popular and people are also ready to spend money on it. The working principle of the band is based on different modules. It will track the details of the users in the initial stage. The use of smart wearable devices are getting more attention of health care industry day by day.

#### **Module 1:Heart beat monitoring:**

Heart rate records provides significant information about the health status of an individual. It can be used in stress and recovery analysis. Accurate detection of beat-to-beat heart rate is necessary for the analysis. The wearable devices consist of a sensors which records the heart beat and pulsation. These are very portable devices having high potential. Heart beat affect to blood pressure and it change the volume of the vessel and rate of blood flow. These volume and flow change can be detected using near red and infrared wave length light source and detector. Using these properties, pulsation, which is related to heart beat, can be measured by gathering detector's signal.. Depressed people have less heart rate variability which is dangerous. They have more risk of hypertension. Depression increases the amount of stress hormone which increases the pumping work of heart. The band will record the data related to heart pulse on a frequent basis as the usual bands do. But in the proposed system the band will also send the data to the server for analysis purpose

#### **Module 2: Motion sensors**

Depressions are also related to physical restlessness and agitation which reflects the physical expression of anxiety. These symptoms include over talking and too much movement, angry outbursts, excessive talking, shuffling the feet. These motion changes will be detected by the band on a frequent basis. The psychomotor agitation is some time less or some time more severe in many cases. The movements are made in response to feelings of restlessness caused to depression or stress.

#### **Module 3**

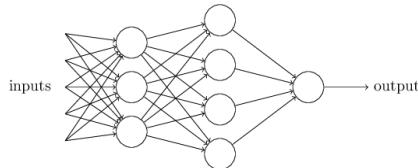
Neural network algorithm is the logic will be running in the background. The details tracked by the band is frequently fed in the algorithm which is a machine learning technology for predicting the values based on analysis. The capability of the algorithm is that it can identify complex relationships between the given input and output data. The algorithm based on pattern recognition. For prediction purpose knowledge is stored and used in logical sequence by the brain due to the result of complex multiple inter-neuronal connective activities. Similarly, information is stored in neural network as weights of interconnections between neural processing units in distributed.

#### **Training the network:**

The algorithm needs to be trained by entering the values observed and recorded by the people going through depression and the people who are normal. Neural nets are organized into layers of nodes, and are feed-forwarded meaning that data moves through them in only one direction. An individual node is connected to many nodes in the layer below it, from which it receives data, and many nodes above the layer which sends the data.

**Weights :** The users is asked with some questions on a regular interval to capture the status of his mind. Depending upon his frequency of reaction including time taken to respond, option selected for responding etc a weight factor will be calculated. To each of the nodes of the network a number known as weight is assigned. Each connections gets the data that multiplies with the associated weight yielding a single number.

Once all connections and multiplication from the above layer gets completed a summation of the weighted input is calculated. This weighted input is compared with the threshold value (calculated using training data). The values after comparison would indicate the level of depression a person is going through. The same will be displayed on the screen of the band, so that the person can self manage himself



## 4. LIMITATION

The proposed system and band is an idea, its validity is yet to be checked using the real values. The types of depression are very large with different types of behavior, so everything could not be tracked using the proposed band. The model needs training data from people going through depression as well as normal people.

## 5. CONCLUSION

The paper is a proposed idea to relieve people from depression. Many a times an individual is unaware about this situation so it become difficult to provide help to them. Neural network is an effective algorithm which works on the functioning of human brain. This technique has lot of scope to develop into an effective means to identify patterns of depression in human and to help them in coming out of it.

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## Removal of Hazardous Thermal Paper Billing Using QR Code

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### ABSTRACT

*Public health is necessary for the growth of the country. Therefore, it is essential to remove hazardous things from the environment to provide a healthy atmosphere. Most of the time, people are not aware of dangerous situations and their impact on health. There is a need to stop the use of thermal paper and to find out the substitute. This project proposed an alternative solution for thermal paper. Thermal paper is the paper used for printing bills in malls, theatre, hotels, restaurants, toll plaza, cash registers, etc. The paper coated with a BPA (Bisphenol A) endocrine-disrupting chemical. Thermal paper spreads this chemical on our body while touching the paper. Researchers have already proved that the exposure of BPA causes obesity, cardiovascular diseases, diabetes, infertility in males and females. This thermal paper can replace with QR code technology. We have developed a QR code billing prototype. This project is useful for vendors and customers, which will be secured public health and the environment from BPA.*

*Keywords: QR code, Thermal Paper, BPA Bisphenol A, Billing, public health, digital receipt.*

### 26. INTRODUCTION

The research proposed that paper receipts are hazardous for public health and environmentally unsound method as a massive quantity of paper used. The paper bill is not useful for the consumer to know purchase history. Further, paper receipts are inconvenient for consumers, who face the frustration of losing receipts needed to make returns, organize expenses, and file taxes [1]. Also, using paper receipts raises both health and environmental concerns. Up to 90 percent of receipts contain cancer-causing chemicals [4]. The receipts printed on thermal paper. The thermal paper is a special fine paper which coated with a material formulated to change color when exposed to heat[5].

BPA is a very stable and heat-resistant chemical, and it used in making the coatings the thermal paper, which gives the unique properties that allow for inkless printing [6]. The thermal paper contains cancer, causing chemicals BPA and BPS in their free form. Our research goal is to eliminate the use of thermal paper using the QR code system. This research facilitates a way for a consumer to manage and maintain their receipts easily.

The outline of this research paper consists of five sections. Section 1 introduces the research problem and solution in brief. Section 2 gives the significance of the study, and Section 3 includes the related work, Section 4 presents the research methodology and Section 5 includes working of the research, Section 6 consists of results and analysis of the experiments and in last section 7 concludes the study.

### 27. SIGNIFICANCE OF STUDY

Significance of the research study divided into three parts: First, to know the risk of BPA, BPS, and BPF chemical use for paper billing. Second to understand health issues and to people aware of its negative impact on public health and third is to save the environment. All these essential details are as follows.

#### 2.1 BPA and BPS Chemical

BPA stands for bisphenol A. BPA is a chemical that has used to make certain plastics and resins since the 1960s. BPA chemical considered to be an endocrine disruptor. BPA is a similar hormone estrogen structure. The hormone estrogen may bind to estrogen receptors, which affects many body functions. Bisphenol-S (BPS) or Bisphenol-F (BPF) is used to replace BPA. BPA and BPF less quantity also damages the cell function like BPA. Therefore, even BPA-free products may not be an adequate solution [7]. Generally, people are not aware of this BPA and BPS chemical and its health-related issues.

#### 2.2 Health Issues

BPA coated paper transfer BPA to the skin when people hold the receipt in hand for five seconds or more. It gets transferred 1  $\mu$ g BPA (0.2–0.6  $\mu$ g) to the fingers if dry and ten times more if it is wet. People who are

handling thermal paper and printer around ten hours a day can transfer BPA, whereas 71 mg per day is high percentage [5].

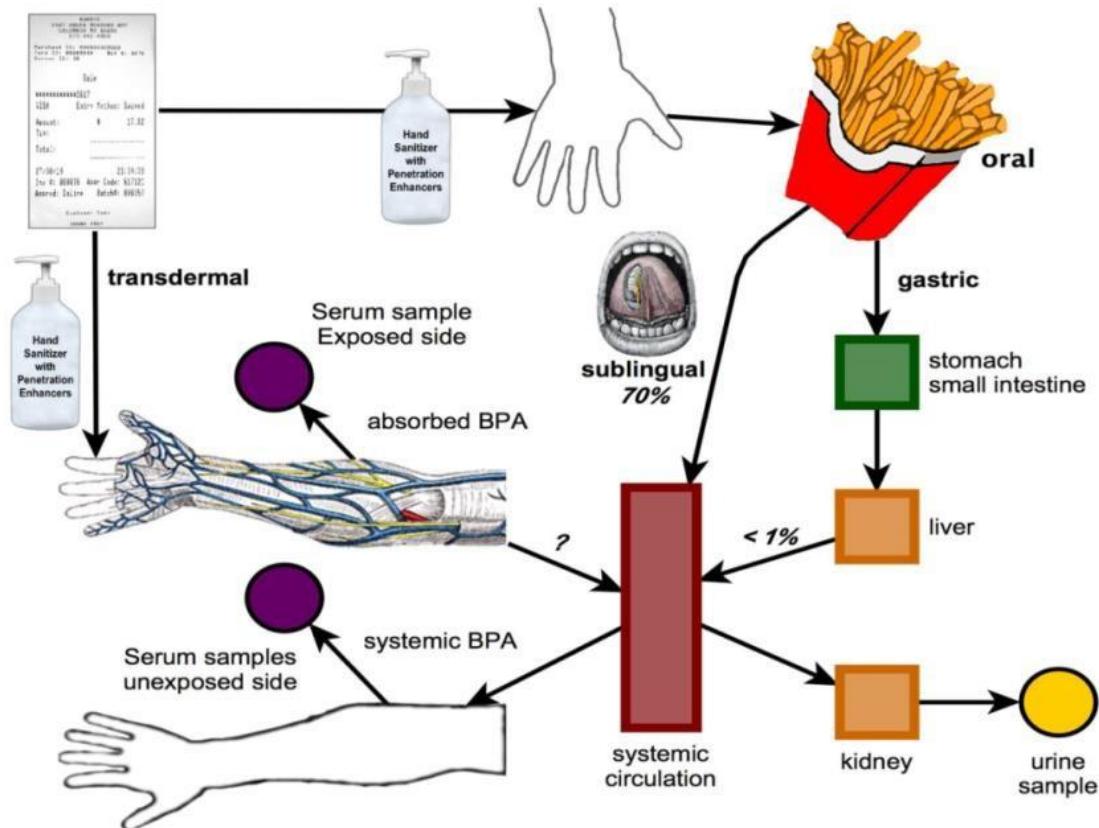


Fig-1: Holding Thermal Receipt Paper and Eating Food after Using Hand Sanitizer [9]

In figure 1 shows how this holding thermal paper in hand, it absorbed in the body and severely impacted on human health. If we touch paper and without washing or cleaning hands, we eat the food, then it will start health problems to mouth, stomach, small intestine, liver, kidney, and skin.

Researchers' human study reported that a 27–135% greater risk of high blood pressure, 18–63% risk of heart disease, whereas 21–60% greater risk of diabetes in people with high BPA levels [7]. It observed that BPA is also impacting on male and female fertility [7]. There is a need to make aware the people how much harmful and unhealthy use of thermal paper for public health.

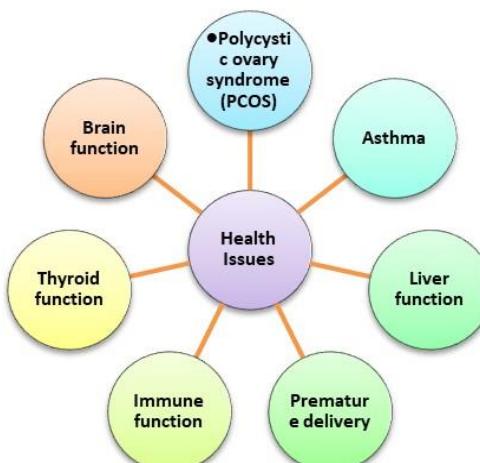


Fig-2: Health issues due to Thermal Paper use

In figure 2, BPA exposure has linked to the following health issues [7]: Polycystic ovary syndrome (PCOS), Premature delivery, Asthma, Liver function, Immune function, Thyroid function, and brain function.

## 2.3 Environmental concern

Environmental maintenance is our social responsibility. Water, trees, and oil are natural resources. Ecological balance is necessary so that natural resources used very cleverly. Thermal paper uses wood, and for that, trees cut in large quantities. To manufacture thermal paper, we kill 10 million trees. Trees can save by removing paper billing. Another concern with thermal paper is that one billion gallons of water wasted to make thermal paper. Thermal paper manufacturing process needs 250 million gallons of oil. Overall, they make for 1.5 million pounds of waste. The material used in the thermal paper can contaminate recycled paper [6]. The removal of thermal paper helps save trees, oil, water, and public health. This solution will help to maintain the environment of nature and human health issues..

## 28. RELATED WORK

The concepts of the QR code system, digital receipt, and also research about BPA chemical briefly introduce in this section.

A QR code is in the form of a matrix bar code or two-dimensional code that can store data information and designed to be read by smartphones. QR stands for "Quick Response," indicating that the code contents should be decoded very quickly at high speed[8]. The QR code system consists of a QR code encoder and decoder. The encoder is responsible for encoding data and generation of the QR Code, while the decoder decodes the data from the QR code[8].



Fig.3: QR code

Retail paper receipts often get lost or misplaced, and consumers are always trying to find easy ways to save and handle receipts[2].

In a sample of 61 consumers, 70% reported having no organized method for storing receipts, whereas 60% said losing receipts is their biggest frustration. 30% of survey respondents believe paper receipts are a growing environmental concern [1]. There are recent developments in the transition from paper receipts to digital ones [2]. Introducing digital receipts or e-receipt can provide a solution to the problem.

Bisphenol A [BPA; 2, 2-bis (4-hydroxyphenyl) propane], is a typical trace endocrine disruption compounds (EDCs), which interfere with the synthesis, secretion, transport, binding, action or elimination of natural hormones in the body that are responsible for the maintenance of normal cell metabolism. BPA widely used in the production of polycarbonate plastics, coating in canning operation, and other industrial applications. Concerning BPA toxicity to the human body, increasing attention has been paid to the risk of BPA in the natural environment recently [3].

## 29. RESEARCH METHODOLOGY

The research method used for this study is modeling and simulation. After reviewing the related work to this study, the solution model proposed for the removal of hazardous thermal paper from generating paper bills. In this experiment-based research, software built up to process the digital bill without the use of paper.

## 30. WORKING OF MODEL

This research paper proposed the Paperless billing system (PBS). PBS provides a wireless transfer of bills from vendor site to customer's mobile using a QR code technology.

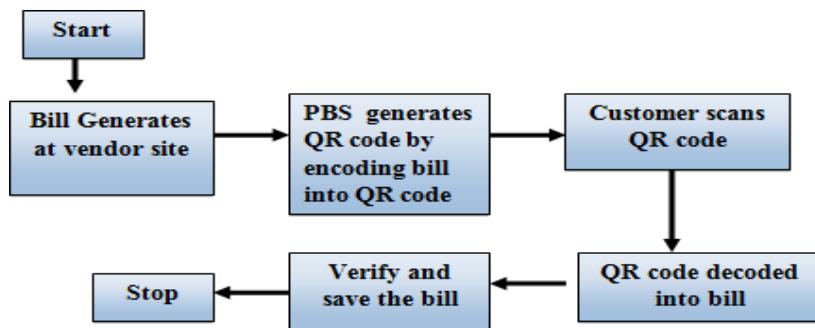


Fig.4: Paperless Billing System using QR code model.

To eliminate the use of thermal paper by introducing mobile applications installed on the customer's device, which scans the QR code of bill generated by the desktop application of cashier. The QR code generated on the desktop application of the cashier encodes the bill, and when the user scans the QR code, the bill will get transferred to the customer's smartphone..

### 5.1 Hardware/Software components

- A. Desktop Application:** it will use to generate QR code by encoding bill.
- B. Mobile application:** it will use to scan the QR code. It also helps in saving and maintaining receipts or bills.
- C. Smartphone:** smartphone on which QR code scanning application will run.
- D. Computer:** It will use to generate the bill and generate QR code on the vendor site.

### 31. RESULT AND ANALYSIS

The result of the PBS system is useful in removing hazardous thermal paper from the existing billing system.

### 6.1 Vendor and Customer site function with PBS

The vendor and customer are two relevant entities in this system. Therefore, a Thermal paperless billing system has two sites, one is a vendor, and another is the customer.

The final model working, result shown below.



Fig.5: Paperless Billing System using QR code model.

**Vendor Site:** This site has its existing paper billing system. Vendors are using software to generate bills utilizing a barcode reader on computer machine on their billing counter. In this system, this vendor site is extended by creating QR code for this bill and make it available to the customer to scan and transferred digital bill on their device i.e., a smartphone with an internet connection.

**Customer Site:** This site, customer carry their smartphone to receive the digital bill. Customers will scan the generated QR code for their bill. Mobile application PBS helps them to transform from QR code into a digital bill and save on their smartphone. Smartphone with internet connectivity is one of the essential requisites in case of large size bills..

1. The PBS system benefits are as follows:
2. 1. It protects the public from hazardous thermal paper health issues and saves our valuable natural resources of the environment.
3. 2. PBS product is less expensive in terms of cost.

4. 3. PBS capable of storing and maintaining the record of bills in the smartphone.
5. 4. It used the wireless transfer of bills from vendor site to customer's mobile using a QR code technology.
6. 5. It provides secure storage of bill which can be used as proof since it can't be misplaced, mishandled, and are not prone to damage.
7. 6. It analyses monthly expenditure by reviewing records of the bill.

## 32.CONCLUSION

This research paper focused on public health issues caused due to the use of thermal paper for billing purposes. It also proposed a solution to remove this hazardous thermal paper from billing by introducing a PBS model. This model is useful for vendor and customer entities of paper billing. The vendor can save expenses on printing and paper. Customer prevents themselves from health issues which may infect because of handling thermal paper. In this model, QR code technology used, which benefitted to customer and vendor. PBS secure public health and the environment.

It concludes that thermal paper coated with a harmful chemical that uses in bill printing. The thermal paper contains Bisphenol A is the chemical causes various health issues. Therefore, a Paperless billing system can develop with the help of QR code technology and existing hardware/software. QR (Quick Response) code is the fastest medium of data transfer.

In the future, research will extend to big files and QR codes technology.

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## Association Rule Mining in Health Care: A Study

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### ABSTRACT

*This paper presents the various areas in Health Care where Association Rule Mining can be applied. Association rule mining is one of the well-established fields in data mining. This paper has surveyed the research papers in this field from 2013 to 2019. ARM pursues to learn relations between transactions set in a database. It can be used to expand result creation in a wide variety of applications such as: medical data analysis, bio-medical works, protein arrangements, survey data, logistic reversion, fraud discovery in network, customer relationship management of debit or credit card business etc. This paper studies the various areas in health care and provides brief indication of present trends of association and common pattern mining and health applications.*

**Keywords:** Association Rule Mining, Application of ARM, Frequent pattern, Data mining, Health care

### 1. INTRODUCTION

Association Rule Mining (ARM) has become a developed field of exploration. So many research papers, articles are surveyed in the field of ARM. This paper presents some essentials about frequent item set generation which helps to develop new procedure for that process. ARM can be divided into the following areas: Positive rule mining, Negative rule mining and Interestingness measures. Major area of work in ARM is coming under these three categories. (Kolappan & Arumuga, 2013).

Association rules have been broadly used in many applications fields for discovery outline in data. The outline reveals mixtures of actions that occur at the same time. One of the best area is commercial ground, where learning of pattern or association helps in real conclusion creation and marketing. Other zones where association rule mining can be applied are discovery pattern in organic records, market basket study of public library flow data, protein composition, population and economic census etc. Recent studies have shown that there are various algorithms for finding association rule. Apriori algorithm is the best known algorithm for association rule mining. However the complication and performance of mining algorithms is subject to research area, as they have to mine a greater set of facts i.e. most of the study are based on how to streamline association rule and to progress the algorithm presentation (Rajak & Gupta).

### 2. BACKGROUND

Let us understand the basis of association rule and their implication. Association rule mining finds stimulating relations and correlation among great set of data items. Association rules show abilities value conditions that occur frequently together in a given dataset. Association rules offer evidence of this type in the form of "if-then" statements. These rules are calculated from the data and unlike the if-then rules of logics, association rules are probabilistic in nature. In addition to the "if" part and "then" part, an association rule has two numbers that express the degree of improbability about the rule. In association study the antecedent and consequent are sets of items that are disjoint (do not have any items in common)(Rajak & Gupta).

**Support:** The support means the number of relations that include all items in the antecedent and consequent parts of the rule. (The support is stated as a percentage of the total number of records in the list.)

**Confidence:** Confidence is the ratio of the number of relations that include all items in the consequent as well as the antecedent (namely, the support) to the number of relations that include all items in the antecedent.

**Lift:** Lift is the ratio of confidence to probable confidence. Lift is a value that gives us evidence about the rise in chance of the "then" (consequent) given the "if" (antecedent) part.

### 3. DATA MINING PROCESS

The volume of data generated in healthcare industry need to be transformed into meaningful information for decision to occur. Data mining provides a great promise in analyzing complexity of data to generate information. The process of data mining helps to discover knowledge which is done in seven steps starting from selection stage to knowledge discovery (I.O, O.L, O.O, & K.T, 2018).

Selection: The first stage of facts mining is to select certain constraints to pick the data.

Pre-processing: This process selects the actual data required for processing. It will nullify some of the parameter that is not needed. It will clean the data.

Transformation: Only data particular to that specific problem is transformed. It changes data that are necessary for specific solution.

Data mining: This stage will discover knowledge.

Interpretation and evaluation: This stage will evaluate the information generated from data mining stages. This evaluation will be useful for making decisions.

### **III. DATA MINING TECHNIQUES IN HEALTH CARE**

Data mining uses Supervised and unsupervised learning. Supervised learning involves a parameter that helps to learn. The learning predicts a result based on certain criteria. Classification and regression are examples of supervised learning. Similarly, unsupervised learning is a technique that does not involve a supervisor. It outlines class of data without his obligation. Common example is the clustering. Clustering: It identifies a category of data in a finite set which describe the task. It can be used to predict an outcome. K-means and x-means are some of the algorithms that have been used in clinical process and diagnosing results.

- a. Partitioned Clustering: categorize associated dataset type into unlike collection and analyze to know the clusters that are generated. Algorithm of the divider clustering helps to predict and diagnosed symptoms for a challenging diseases.
- b. Hierarchical Clustering: It cluster dataset features in form of chain of command that are used for calculation in healthcare. It can breakdown its process either from top to down or from down to up methods.
- c. Compactness Based Clustering: The clustering method complements the disadvantages of the partitioned and hierarchical clustering. It clusters together similar points that are collected in a datasets, points that are closer to each other. This detect anomaly in points that are gapped within themselves (whose close neighbours are too far away). It is the most used clustering algorithm because of the efficiency.

Unsupervised learning: The data mining techniques are applied in the large complexity data to discover knowledge in data. Classification, regression, association and clustering have been used in this regard.

### **4. APPLICATION AREAS**

The various application areas in which association rules can be applied for extracting useful information from the huge dataset are:

#### ***4.1 Medical diagnosis***

Medical Diagnosis is a complicated process. ARM can help the doctors or physicians to cure patients. The general problem of the induction of reliable diagnostic rules is hard because theoretically no induction process by itself can guarantee the correctness of induced hypotheses. Diagnosis involves unreliable tests and the presence of noise in training examples. This may result in hypotheses with unsatisfactory prediction accuracy which is too unreliable for critical medical applications.

A technique based on relational association rules and supervised learning methods are planned. It helps to identify the chance of illness in a certain disease. This interface can be simply extended by adding new symptoms types for the given disease, and by defining new relations between these symptoms.

#### ***4.2 Protein sequences***

The study of protein sequence evolution is the foundation of molecular evolution and it offers insights in the mechanism of evolution. The evolution rate of protein is weakly influenced by the functioning of proteins. For any organism, Proteins are vital constituents of cellular machinery. Recombination of DNA technology has provided tools for the rapid resolve of DNA sequences and, by deduction, the amino acid sequences of proteins from structural genes. Proteins sequences are made up of 20 types of amino acids. Each protein has a unique 3D structure, which depends on amino-acid series; slight change in sequence may change the performance of protein. The heavy reliance of protein performance on its amino acid series has been a subject of great concern.

The mechanism of protein sequence growth has been the center for study. A vast research has gone into understanding the composition and nature of proteins; still many things remain to be understood satisfactorily. It is now generally believed that amino acid sequences of proteins are not random. Some have deciphered the

nature of associations between different amino acids that are present in a protein. Such association rules are desirable for enhancing our understanding of protein composition and hold the potential to give clues regarding the global interactions amongst some particular sets of amino acids occurring in proteins. Knowledge of these union rules or constraints is highly attractive for synthesis of fake proteins.

#### **4.3 Identification of Diseases**

Data mining based on association rule for finding incidence of ailment by patients. Medical stat association forecast was devised to extract information from healthcare database which predict the relationship among primary disease and secondary disease. A methodology to identify the locally frequent diseases by implementing Apriori mining technique is suggested. The data may be collected data from medical centre and generate a frequent pattern to identify the frequent disease. The current system of knowledge discovery in medical database using data mining can be studied. They also carried out some comparative study among techniques and concluded that the association rule mining perform well for medical data set. Various applications of association rule mining in medical data in areas of infections, adverse drug reactions, etc. By understanding the previous work carried out by various researchers in the area of data mining of disease analysis, the current work of the author is unique and it is need and important for the society.

#### **4.4 Health Informatics**

It deals with managing health data and applying medical concepts in conjunction with health information technology systems. It can assist clinics to provide better health care. It has grown in size with the expansion of electronic health records and data analytics. Clinical informatics is used in direct patients. It is useful to nurses, physicians and therapist with information that can be used to develop a care plan. It can also develop interfaces to health IT systems to help clinical caregivers more easily view the health information and use the health data.

Since health informatics has received a lot of awareness from researchers in last decade. There are several branches to it. It is interesting as well as necessary to reconsider state of the art wellbeing informatics study. As knowledge discovery researchers and practitioners have applied a collection of data mining techniques for facts extraction from health data, so the claim of association rule mining techniques to health informatics domain has been focused and studied in detail in this survey. Through significant analysis of applications of association rule mining literature for health informatics, it has been explored that, instead of the more resourceful option approaches, the Apriori algorithm is still a widely used frequent itemset generation technique for application of association rule mining for health informatics. Moreover, other limitations related to applications of association rule mining for health informatics have also been identified and recommendations have been made to mitigate those limitations. Furthermore, the algorithms and tools utilized for application of association rule mining have also been identified, conclusions have been drawn from the literature surveyed, and future research directions have been presented.

#### **4.5 Breast Cancer detection**

Data mining studies performed on medical database are important to make, effective medical diagnosis. Data Mining can extract information from databases, define clear and understandable patterns. With the extensive applications of computer and knowledge, the amount of data produced by many disciplines has enlarged quickly. In order to mine valuable knowledge from that data, Mining methods are recycled to get some meaningful results. By using data removal techniques, expectant results have been obtained in diseases diagnosis, organ transplantation, the treatment, image assessment, drug expansion, technical study etc. In health field data digging applications has its own benefits because the data calm is overall, true, reliable and not achieved by other issues. A medical database is an enormous database. For instance a patient presenting symptoms to some disease, the laboratory tests and the treatment related to that disease may be specifically the same.

In earlier data excavating the vast number of defective and noisy info must be cleaned to safeguard the data dependability. The medical verdict expert systems are recycled to turn experts' knowledge into the directives. As we work the patient indications into the scheme, it will be capable to make the decision about disease rapidly and it reduces the error of doctor's slanted judgment. Data extraction techniques are also used to find the esteemed diagnostic instructions by dispensation a vast data of patient database. Data excavating techniques are used to make medical decisions to cure diseases.

#### **4.6 Clinical Observations**

System-prototype, using the association rules of data mining technique applied to a patients' database for discovering patterns of diseases that might be carried by a patients. As a novel idea of mining the data capturing process can further be modified in the clinics as well as in the data-warehouses which should further be involved to enhance the system. The recognised pattern by this implementation definitely can improve the healthcare services along with medical researchers for further exploring trends of diseases that are correlated. To ensure strong national economy and bio-security by having healthier inhabitants, the system can ensure wellbeing further. It can investigate correlation among diseases for patients of different age and sex groups providing the outcome in statistical as well as in graphical format. The system we developed has been based on computer generated data. However, it is our future target to enhance the system for the aforementioned various cases, applying the system on collected real-life data while enhancing the proposed system rigorously.

## 5. CONCLUSION

In this work a revision on the main function areas of union rules has been focused. It is all about to find some kind of pattern or relationship between various datasets. The outcome is association rules, and it is an iterative refinement process. A study of various areas where association rule mining can be applied is studied. This paper suggests, how the results can be enhanced using association rule mining and can be compared with results obtained manually.

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## Skin Disease Classification using Convolutional Neural Network

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### ABSTRACT

The skin covers the whole body. An important function of the skin is to protect the body from infection. Skin diseases are ranked as the fourth most common cause of human illness[1]. Therefore detecting them in their early stage can help the patient cure the disease early. So the proposed paper facilitates the development of an automated system which classifies Acne, psoriasis, scabies, rosacea and fungal infection diseases using transfer learning with an Inception V3 model architecture. We have trained and tested the model using the skin disease images from the Dermnet, Dermis and Dermnet NZ dataset and have achieved about 90% accuracy.

**Keywords:**-CNN, Transfer Learning , Inception Model

### LITERATURE REVIEW

Sr. No.	Title of the paper	Authors, Country, ISBN/ ISSN No.	Dataset Used	Pre- processing methods	Methodology/ Algorithms Used	Output
1.	Automated Detection of Dermatological Disorders through Image-Processing and Machine Learning	Soumya Sourav, Nikhil Garg, Yasha Hasija Delhi Technological University, India 978-1-5386-1959-9/17/\$31.00 ©2017 IEEE	The original dataset consisted of around 3000 images which after augmentation becomes close to 10,000	SMOTE (Synthetic Minority Over-Sampling Technique), Changing the perspective of images, Implementing computer vision techniques like gray scaling, blurring, increasing the contrast, changing the color channel, sharpening, reducing the noise and smoothing	The features extracted by CNN are then passed through the SVM for further classification of the diseases. Focus area: Chronic Eczema, Lichen planus and Plaque psoriasis	Accuracy 95.3% This work was supported by the Department of Biotechnology, Government of India [No. BT/PR5402/BID/7/508/2012].
2.	Comparison of Machine Learning Algorithms for Skin Disease Classification Using Color and Texture Features	Parameshwar R. Hegde, Manjunath M. Shenoy, B.H. Shekar Mangalore University Mangalore, Karnataka, India 978-1-5386-5314-2/18/\$31.00 ©2018 IEEE	Study images were collected from patients visiting Dept. of Dermatology, Yenepoya Medical College, Mangaluru (Ethical clearance : YUEC/366/2016)	Feature extraction: extracted Red, Green and Blue (RGB) color features and Gray Level Co-occurrence Matrix (GLCM) texture features	ANN, Naive Bayes, Linear Discriminant Analysis (LDA) and Support Vector Machine (SVM) Focus area: Chronic Eczema, Lichen planus and Plaque psoriasis	LDA performed better in binary as well as multiclass scenarios using color feature based classification; (b) SVM gave better accuracy for texture features in both binary and multi-class classifiers; (c) for the combined feature, LDA and SVM classifiers showed better performance in binary and multi-class classification respectively.
3.	Computer-aided Diagnosis of Four Common Cutaneous Diseases	Xinyuan Zhang, Shiqi Wangb, Jie Liub, Cui Tao Beijing, China 978-1-5090-	obtained from the Department of Dermatology, Peking Union Medical College Hospital. The clinical database		CNN Focus area: melanocytic nevus, seborrheic keratosis (SK),basal cell	The average accuracy results were 86.54% for dataset A and 85.86% for dataset B. The research was partially supported by the National Library

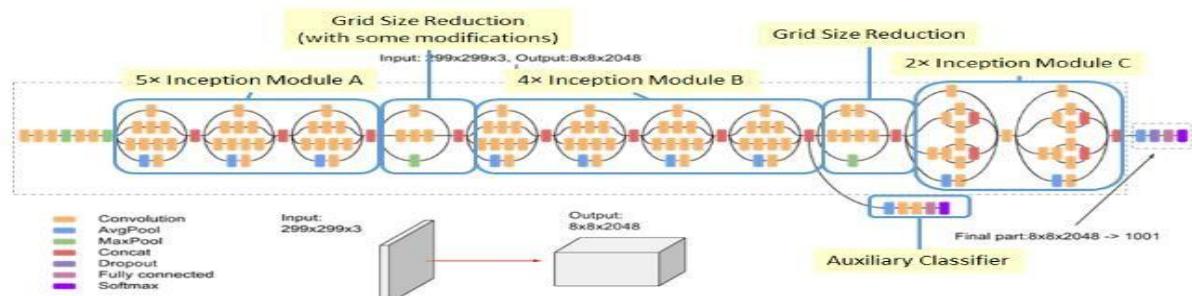
	Using Deep Learning Algorithm	3050-7/17/\$31.00 ©2017 IEEE	currently includes a collection of more than 28,000 skin dermoscopic images using the MoleMax HD 1.0 dermoscopic device.		carcinoma (BCC) and psoriasis.	of Medicine and National Institute of Allergy and Infectious Diseases of the National Institutes of Health under Award Number R01LM011829.
4.	Detection and Classification of Acne Lesions in Acne Patients: A Mobile Application	Nasim Alamdari, Kouhyar Tavakolian, Minhal Alhashim, MD FAAD, and Reza Fazel-Rezai University of North Dakota 978-1-4673-9985-2/16/\$31.00 ©2016 IEEE	In this study, images of various dermatology resources were used.	35 images were used to perform the segmentation and classification of the different types of acne lesions such as comedone, red papule and pustule.	The fuzzy c-means (FCM), Support Vector Machine (SVM) Focus area: Acne lesion	The average accuracy of classification to distinguish acne scarring from inflammatory acne for FCM and linear SVM methods were 80% and 66.6%, respectively.
5.	Diagnosis of skin diseases using Convolutional Neural Networks	Jainesh Rathod, Vishal Waghmode, Aniruddh Sodha, Dr. Prasenjit Bhavathankar Sardar Patel Institute Of Technology, Mumbai, India 978-1-5386-0965-1©2018 IEEE		Noise removal unit: Removes the unwanted pigments and hair from the image. Image enhancement unit and segmentation: Brings the affected part into focus by enhancing the area and also segmenting the area into various segments so as to differentiate it from the normal skin.	CNN	An initial training gives the output accuracy of 70% approximately.
6.	Machine Learning on Mobile: An On-device Inference App for Skin Cancer Detection	Xiangfeng Dai, Irena Spasić, Bradley Meyer, Samuel Chapman, Frederic Andres Tokyo, Japan 978-1-7281-1796-6/19/\$31.00 ©2019 IEEE	The dataset consists of 10,015 dermatoscopic images from different populations separated into seven categories (types of skin lesions)	Rotation, Zoom, Width shift, Height Shift	Focus area: Skin Lesions dataset into three subsets to be used for training (64%), validation (16%) and testing (20%) respectively.	Accuracy: 75.2%
7.	Multi-Class Skin Diseases Classification Using Deep Convolutional Neural Network and Support Vector Machine	Nazia Hameed, Antesar M. Shabut, M. A. Hossain Anglia Ruskin Ruskin University Chelmsford, UK		The images in the data store are divided into training and testing dataset in the ratio 70:30, i.e. 70% of images are used for training the classifier, and 30% of data is used for testing.	Algorithm used: CNN, SVM	Accuracy 86.21%  This research work is funded by Erasmus Mundus FUSION (Featured eUrope and South asIa mObility Network) project Grant reference number:2013-32541/001001.
8.	Multi-classification	Hangning Zhou, Fengying Xie,	From the 28,653 images of		Algorithm used: VGG-16,	Accuracy: VGG-16: 61.8%,

	of skin diseases for dermoscopy images using deep learning	Zhiguo Jiang, Jie Liu, Shiqi Wang, Chenyu Zhu  Hangning Zhou, Fengying Xie, Zhiguo Jiang  978-1-5386-1620-8/17/\$1.00 ©2017 IEEE	Department of Dermatology, Peking Union Medical College Hospital, 11,566 images were selected as experimental dataset		GoogLeNet, ResNext - 50, ResNet-50, own method  Focus area: nevus, seborrheic keratosis, psoriasis, seborrheic dermatitis, eczema and basal cell carcinoma.	GoogLeNet: 57.4%, ResNext - 50: 58.0%, ResNet-50: 63.6%, own method: 65.8%  CLASSIFICATION ACCURACY OF THEIR METHOD AND THE DERMATOLOGISTS  Dermatologists: 83.6% Own method: 90%
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## METHODOLOGY

Conventional machine learning and deep learning algorithms, so far, have been traditionally designed to work in isolation. These algorithms are trained to solve specific tasks. The models have to be rebuilt from scratch once the feature-space distribution changes. Transfer learning is the idea of overcoming the isolated learning paradigm and utilizing knowledge acquired for one task to solve related ones. So we have used Transfer Learning Inception V3 architecture to build our model. Inception v3 architecture model trained on ImageNet images, and train a new top layer that can recognize other classes of images. The top layer receives as input a 2048-dimensional vector for each image. We train a softmax layer on top of this representation. The softmax layer contains 5 labels of 5 classes, this corresponds to learning  $5 + 2048 \times 5$  model parameters corresponding to the learned biases and weights.

### Inception-V3 architecture



Inception v3 network stacks 11 inception modules where each module consists of following layer

### 1. CONVOLUTION

Convolution layer has been applied first to extract features from the input image of size 299x299x3 using filter of size 3x3 with stride of 2 once and stride of 1 twice and it learns the relationship between features using kernel or filters with input images.

### 2. BATCH NORM AND RELU

Batch norm layer is applied after linear layers (convolution) and before non linear layers (ReLU). Batch normalization reduces the amount by what the hidden unit values shift around (covariance shift). Also, batch normalization allows each layer of a network to learn by itself a little bit more independently of other layers.

ReLU stands for the Rectified Linear Unit for a non-linear operation. The output is  $f(x) = \max(0, x)$ . we use this because to introduce the non-linearity to CNN.

### 3. POOLING

It is used to reduce the number of parameters by downsampling and retain only the valuable information to process further. This model applies both Average and MaxPooling using patch of size 3x3 of stride 2.

### 4. DROPOUT

Significant dropout rate has been applied to prevent a model from overfitting.

### 5. FLATTENING

We flatten our entire matrix into a vector like a vertical one. so, that it will be passed to the input layer.

## 6. Fully Connected Layer

We pass our flatten vector into input Layer .we combined these features to create a model. Finally, we have an activation function such as softmax or sigmoid to classify the outputs.

After each inception module efficient Grid Size reduction is done and only one Auxillary Classifier is used on the top as regularizer.

## IMPLEMENTATION

In this section we discuss the implementation of our system which involves the following steps:

1. Data Collection
2. Training and Testing

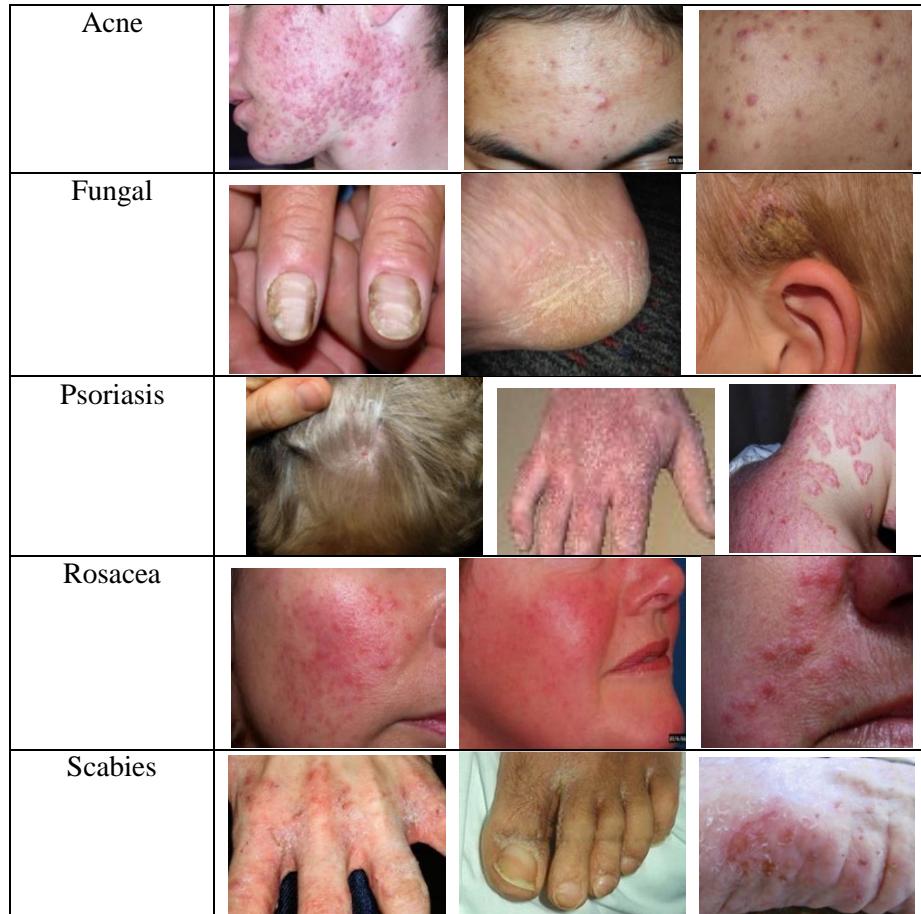
### 1. Data Collection

The data collection is done completely online from the dermnet,dermnetNZ,dermis datasets.

The table below shows the statistics of images in all 5 classes

Class Id	Class Label	Total Images	No. of Training Images	No. of Testing Images	No. of Validation Images
1	Acne	300	240	30	30
2	Psoriasis	79	63	8	8
3	Scabies	80	64	8	8
4	Fungal	76	60	8	8
5	Rosacea	51	41	5	5

### Samples images from each class



## 2. Training and testing

In this model, we will reuse the feature extraction capabilities from powerful image classifiers trained on ImageNet and simply train a new classification layer on top.

The first phase analyzes all the images on disk and calculates and caches the bottleneck values for each of them. 'Bottleneck' is an informal term we often use for the layer just before the final output layer that actually does the classification. (TensorFlow Hub calls this an "image feature vector".) This penultimate layer has been trained to output a set of values that's good enough for the classifier to use to distinguish between all the classes it's been asked to recognize. That means it has to be a meaningful and compact summary of the images, since it has to contain enough information for the classifier to make a good choice in a very small set of values.

Once the bottlenecks are complete, the actual training of the top layer of the network begins. The training accuracy shows what percent of the images used in the current training batch were labeled with the correct class. The validation accuracy is the precision on a randomly-selected group of images from a different set.

A new softmax and fully-connected layer is added and trained to identify new classes. For training the model we run 1,500 training steps. Each step selects 160 images at random of which 80% used for training, 10% for testing and validation each, finds their bottleneck value from the cache, and feeds them to the final layer of the CNN to get predictions. These predictions are compared against the original labels to find the deviation. The final layer's weights are updated in accordance with the deviation observed through a back-propagation method. This method is used in the Gradient Descent Algorithm where the error rate is calculated at the output and distributed back to the previous layers. The algorithm adjusts the weights of the array. This phase goes under a loop until minimum error rate is fetched.

After all the training steps are complete, we run a test accuracy evaluation on a set of images that are kept separate from the images used for training. This test evaluation provides the best estimate of how the trained model will perform on the task of classification.

## RESULTS

The proposed model generates training accuracy of 98%, testing accuracy of 73.2% and validation accuracy of 70%. The table below shows the input image used for testing and output class of that image having accuracy above 70%.

Input	Output	Input	Output	Input	Output
	Acne		Psoriasis		Scabies

## CONCLUSION

Considering the benefits offered by the convolutional neural networks to recognize images we try to use them for skin disease classification. We have implemented a convolutional neural network by retraining final layer of ImageNet for the task of classifying skin diseases and have achieved high accuracy. We will try to increase the accuracy of model by adding more dataset. We will train and test this model on other types of skin diseases and with healthy skin.

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## Applications of Internet of Things & Nano Technology in Health Care

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### ABSTRACT

*In today's world, with the advancement of the Internet of Things (IoT), all entities are connected by some communication means. Extensive research is dedicated to the exploration of various technologies such as information technologies (IT) in complementing and strengthening existing healthcare services. In particular, IoT has been extensively applied to interconnect available medical resources and provide efficient, reliable, and smart healthcare service to patients. The aim of this paper is to summarize the applications of nanotechnology and IoT in the healthcare industry for future research in the healthcare sector. Based on a detailed literature review and the discussion of the accomplishment of the researchers, the advancement of IoT in healthcare systems has been examined from the perspectives of enabling technologies, IoT-based smart devices and systems, nanotechnology, and different applications of IoT in the healthcare industries. The challenges and proposals of the development of IoT based healthcare systems are discussed.*

**Keywords:** Healthcare, IoT, RFID, Nanotechnology.

### 1. INTRODUCTION

The healthcare industry is largest industry in many countries in terms of job creation, number of employees, and expenditure. Healthcare sector is one of the most convoluted industries because it involves multiple challenges and stakeholders, including patient safety; the ability to track and trace medical devices, pharmaceuticals, and transfer of products from manufacturers to patients; and the pervasive use of error-prone methods in providing critical healthcare services. To overcome these challenges, the adoption and efficient use of IT is a crucial component of healthcare strategy. IT can ease the transformation of the healthcare sector through improved patient management, better service quality, enhanced operational efficiency, and enhanced patient care. Recent advances in physiological sensors and embedded devices, in conjunction with the increasing use of wireless networks have given rise to a diverse range of wearable IoT health monitoring systems. Recently, new technologies such as the 'Internet of Things' have been emerging as new tools that will broaden healthcare transformation. At the core of the IoT concept, Radio Frequency Identification (RFID) technology, disruptive and open innovation, is regarded as the next thing of IT innovation. Which is capable of helping to solve most of the healthcare challenges[1][2][3][4][5]. The improvements in the capacity of integrated circuits, advancements in nanotechnology, and the satisfaction of information in terms of accuracy have prompted the renewed interest in the 'relative advantage' of RFID, compared with traditional Automatic Identification and Data Capture technology. However, very fewer studies have been conducted on the role of RFID technology as an enabler of enhanced asset management within the healthcare sector. This paper, therefore, represents an initial attempt to narrow down the existing knowledge gap observed in the literature. This paper draws on a review of the Internet of Things with an emphasis on RFID technology, and RFID technology potential in asset management-related processes, as well as applications of nanotechnology in healthcare. The paper is organized as follows: Section 2 discusses RFID technology and IoT based instruments potential in healthcare. Section 3 reviews the application of nanotechnology in the healthcare sector.

One promising method to alleviate the aforementioned problems of medical rehabilitation is to adopt IoT technologies and intelligentize medical service systems. In recent years, applying Internet-based technologies for rehabilitation services has become popular after introducing some new concepts, such as Smarter Planet and Smart City. In this way, pervasive interactions exist among things, humans, or both. In IoT, radio frequency identification tags (RFID), sensors, and personal digital assistants (PDAs) are made ubiquitous to acquire real-time data and support decision-making activities. With the smart perception in an IoT, smart cities are capable of improving the performance of public services and business infrastructure in the ways that real-time data can be collected and analyzed, abrupt and emergent events can be acknowledged and responded timely, and

resources in the cities can be managed and controlled appropriately. In this way, the usage of rehabilitation resources can be maximized, and it can be anticipated that IoT-based intelligent technology would become an irreplaceable tool in modern healthcare systems.[6]. This new technology helped to shape smart home, smart wearable, Smart grid house, Hybrid cars, and in healthcare AI system. In communication, it provides links between human-to-things, things- to-things and human-to-human, through unique identity. Terms related to IoT involve IP, EPC, Wi-Fi, Bluetooth, NFC, etc. IoT needs a protocol for better efficiency. Researches declared that IoT has a limited storage capacity as well as processing capacity, including security, reliability, performance, and privacy. While the cloud has unlimited capacity. Paper claims that their emergence creates more significant customer satisfaction at all. [7,8]. The studies regarding security and interoperability issues in IoT architecture in the health sector are still low in number[9–11]. S. Guntur et al. briefly reviewed the current state of the internet of medical robotic things(IoMT)-related services and technologies in healthcare and monitoring[12].

## 2. RFID

The RFID technology is expected to play an integral role in terms of business value creation and realization. Although the high level operational and strategic potential of the technology, very few studies have been conducted on the importance of RFID relative advantage and the RFID impact on asset management related processes in healthcare. Also, RFID can store data or recall about itself and it contains a language that will allow displaying its features and production requirements[13]. RFID technology provides improved capabilities, including the identification of irrelevant line of sight, unique item level product identification, multiple tag product reading, enhanced data storage capability, and data read and write capabilities. RFID can be used to support various activities within the healthcare sector, including the tracking of blood bags, monitoring of drug allergies, access to patient record transactions, improvement of healthcare decision making and healthcare resource allocation, and the facilitation of individual patient reminders and alerts. Besides, IT offers hopes for the integration of patient information to promote quality of care and enhance efficiency. IT is important in all decisions related to "managing, processing, retaining, and making accessible large amounts of disparate data to multiple end-users." Thus, IT, IoT, and other emerging technologies are considered "the biggest levers that will re-make healthcare for the 21st century". Compared with other methods such as barcoding, RFID technology offers a more improved mechanism for patient identification, tracking, and tracing within healthcare facilities. Also, the same technology can be used to support all steps related to the blood transfusion process. The adoption and efficient use of RFID in the healthcare sector gives the development of predictive maintenance strategies for medical equipment. Despite such claims, very few studies have been conducted on the advantage of RFID technology, also its role as a facilitator of improved asset management in the healthcare sector[7,13–16].

IoT based wearable devices are getting enough attention because many people are deriving genuine benefits from them. The pushbuttons on the devices can immediately send out alerts for emergency medical help. Implantable Medical Devices like Pacemakers, Defibrillators And Neuro- Stimulators are already in use worldwide. Insulin pumps are cell-phone-size devices used to deliver preprogrammed and user-adjusted doses of insulin[17]. Wearable motion tracking system tracks a patient's body segment movements, and these movements can be represented on the reconstructed human model. Whenever there is a need to track the activities of the patient in ICU, this system is the most useful. An automatic electronics tonometer is widely used in homes and hospitals since it is handy and has lots of usabilit[17]. In operation theater, doctors require checking different reports or x-ray. Google Glass aids have successful surgeries in a higher percentage, and having such immediate and close access to the data helps to confirm doctors their decisions during operation. Studies showed the consequences of patients not taking medications according to doctor's orders could be severe. An automated pill dispenser is now available that brings together wireless M2M and IoT as well as mobile phones. The sensor-based dispenser monitors medication usage and sends that usage information over the wireless network to a central server[17].

Networked body sensing devices coupled with sensors in our living environment enable the real-time and continuous collection of information related to patient's physical and mental health and related behaviors. Captured continually and aggregated, such information needs to be effectively exploited to permit real-time, continuous and personalized monitoring, treatments, and interventions. However, medical decisions are often sequential and uncertain in nature. Sequential decision- making models such as Markov decision processes and partially observable MDPs constitute powerful tools for modeling and solving such stochastic and dynamic

problems[18]. D. Zois surveyed powerful and important models Markov decision processes, multi-armed bandits, and partially observable Markov decision processes that can successfully capture the complex sequential decision-making nature of treatment and medical diagnosis. Since medical decision-making is inherently complex and uncertain concerning the treatment outcomes and costs associated with different diagnostic tests. Considering the healthcare IoT scale with millions of EHRs, biometrics signals, treatments, interventions, and patient-doctor interactions, scalable decision-making models and approaches must be revised[18][19].

Integrating healthcare services in the IoT brings about various cyberattacks to security and privacy. Weak security measures insecure networks augment privacy risks. Therefore, this increase in security hazards will contribute to increasing privacy risks as well. For instance, a business can track a user's buying habits and patterns and uses this information to generate and raise the price of commodities at any given time. Complex encryption techniques will not make sense for all IoT devices. Hence, there is a requirement for a framework to share private information under a single umbrella. How to implement traditional privacy principles such as data minimization, need-to-know, and informed consent in an automated, dynamic, and highly scalable IoT environment remains an main challenge[20]. Further research and development are needed by both researchers, industry partners, and practitioners to address some key challenges and limitations in order to realize the full potential of both of these technologies[21]. New opportunities are now arising as a result of fast-paced expansion in the areas of IoT and Big Data. As most of the people around the world have begun to adopt wearable biosensors, new applications eHealth and mHealth technologies have developed. These technologies are easily accessible, highly available, and simple to personalize. Major technological milestones will need to attain to overcome hurdles of these new technologies and that requires collaboration among the hardware, software developers and medical personnel[22–24]. I MSkierka examined how the convergence of safety and security risks in connected healthcare challenges the governance of medical systems safety. The analysis shows that the management of safety and security risks of medical systems requires the extension of existing governance mechanisms, including regulation, standards, and industry best practices, to combine both safety and cybersecurity in healthcare[25][26]. Successfully dealing with numerous challenges IoT-based healthcare services are faced with should enable reduced costs, increased quality of life, and enrich both patients and healthcare providers' experience. Even the IoT is immensely changing healthcare; those changes are barely starting. Satisfying essential demands, immensely improving existing healthcare systems, and continuously looking for entirely novel ways of monitoring and delivering healthcare will lead to experience the maximal benefits IoT-based e-health has to offer[27].

### 3. NANOTECHNOLOGY

Nanotechnology is the restructuring of material at the Nanoscale, creating devices, materials, and systems with unique properties and functions due to their nanostructure. From 2005, products with "active" nanostructures and devices have been introduced to meet needs by current technologies, for example, molecular diagnostic tools and life-saving targeted drug therapeutics. The present article focuses on the past, present, and future of nanotechnology with a special focus on the application of nanotechnology in differnt fields of medicine [28].

Nanoscale medicines have made significant improvements in the laboratory, in clinical trials, and the utilization of biocompatible materials, diagnostics, and treatments. Advanced therapeutics such as Abraxane is making a significant impact in treating different types of cancer. The first point of care nano-enabled medical diagnostic tools such as the Verigene system is now being used around the world to diagnose diseases rapidly. Dynamic physicochemical interactions between nanomaterial surfaces and surfaces of biological components are called a nano-bio interface. The result of these interactions determines bioavailability, nanoparticle uptake, and the possibility to carry out bio physicochemical reactions that could be of therapeutic as well as diagnostic use. This nano-bio interface will revolutionize the way medicine is practiced, create a new diagnostic and therapeutic capabilities for the pharmaceutical industries, and catalyze extraordinary advances in molecular and cell biology. The most assuring future nanoscience-based applications in medicine are ultrasensitive and selective multiplexed diagnostics, targeted treatment of cancer, drug delivery and other diseases, body imaging, tissue/organ regeneration, and gene therapy. New approaches for imaging, drug delivery, and diagnostics will be refined and developed, and more sophisticated nano-therapeutics and diagnostics will supplement those already in clinical use or clinical trials.

In future, diagnostics will provide earlier and more accurate bioanalyte detection capabilities, and localized nano therapy will provide more effective treatments. Lastly, continued advances in bioengineering and the bio-

nano interface will provide robust means to guide stem cell fate and to regenerate tissues. Several nanomedicine pathways can improve through the realization of the opportunities in personalized medicine for the identification, targeted treatment of sets of patients with particular cancer types, development of targeted therapeutics with higher efficacy, and reduced side-effect profiles. The opportunities for nanotechnology in cancer treatment are numerous and are expected to have a significant impact. After some years it should be possible to create nanodevices for initial stage diagnosis and post-therapy monitoring nanodevices for the interrogation of circulating tumor cells. The requirement to design particles to enable penetration of the blood-brain-barrier and enable more effective treatment of brain tumors is much needed. The overall impact of nanotechnology on point-of-clinical-care delivery will be multifaceted, with significant advances in patient screening, diagnosis, staging, treatment, and monitoring. Major milestones over the past decade are the FDA-approvals for the first nanotherapeutics, FDA-clearances for the first nano-enabled in vitro diagnostic tools, The first siRNA human trials involving nanomaterial delivery systems, Development of intracellular probes for checking the genetic content of a cell, its metabolic activity, Imaging of the sites of therapeutic targeting (theranostics), and Development of mechanized nanoparticles that are capable of stimulus-responsive release of guest molecules[29]. Several groups of researchers, including clinician-scientists, are working on exciting developments in areas embracing all aspects of patient care from nanotechnology-based theranostic devices for wound healing to tissue-engineered solutions for vascular disease[30].

Nanotechnology has provided enhanced and efficient solutions to various applications in industry, agriculture, biomedical, and many more. The interconnection of nanodevices and nanosensors with the Internet has promoted the development of "Internet of Nano Things" (IoNT). IoNT infrastructure can be set up by mixing nanodevices and several other technologies like Cloud Computing, IoT, Big Data Analytics, Sensors Network, etc. IoNT is noted as the most miniaturized nanosensor networks having huge potential to be as adaptable in real-time applications in diverse fields. However, even though of having tons of advanced advantages, IoNT also suffers from some issues and challenges which required to be addressed so that IoNT can become an indispensable part of mankind in the future without any hurdles[5]. The internet of bio Nano things (IoBNT) stands as a paradigm-shifting concept for communication and network engineering, where novel challenges are faced with developing efficient and safe techniques for the exchange of interaction, information, and networking within the biochemical domain while enabling an interface to the electrical domain of the Internet. Within the scope of the IoBNT, uniquely identifiable basic structural and functional units that operate and interact within the biological environment are defined as Bio-NanoThings.

## 4. CONCLUSION

Future development Conclusion can be made that the rapidly advancing information technologies and emerging IoT technology have provided great opportunities for developing smart healthcare information systems. Nevertheless, challenges still exist in achieving secure and effective healthcare applications. Facing tremendous information and great complexity, IoT itself cannot provide rehabilitation treatments or construct medical resources. Some self-learning algorithms can be applied to analyze data and knowledge. The study on multifunctional sensors with lighter materials such as carbon fiber or even fabric is very promising in the future. Another drawback for sensor devices is a power supply; much effort has been made to develop sensors with low energy consumption and use new sustainable energy such as solar power.

The prerequisites of applying IoT-based systems are utility and safety for users. To restrict unauthorized use of private information and to allow authorized use, intensive research is needed in the areas of dynamic trust, security, and privacy management. The research must be required to have a separate protocol for IoT and some fundamental research needed in different layers of IoT architecture. In the future, wearable sensors, wireless communication technologies, Wireless Sensor Networks (WSN), WBAN, and Human Bond Communication are going to become an embryonic research area worldwide. The IoT is shaping modern healthcare with promising technological, economic, and social opportunities. The development of IoT, Internet of Nano Things (IoNT,) nanomachines, Nanotechnology will have an immense impact on advanced development in nearly every field in the near future.

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## Knowledge Representation Using Yaml for Animal Husbandry Disease Diagnostics

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### ABSTRACT

*AI application in health sector will improve the quality of life by early and timely diagnosis of the diseases. In rural areas of India, where veterinary doctors are substantially less in number; AI application can equip farmers with a tool to detect disease in livestock at earlier stage. In order to make an AI application to run, it need to be trained with substantial amount of data-set, that forms the AI knowledge base. This AI knowledge base can be represented in various data structure formats. This research work proposes how the use of YAML file in the creation of AI knowledge base is effective.*

*Keywords: AI Knowledge, YAML, AI Interface, Veterinary doctors*

### 33. INTRODUCTION

Animal Husbandry is one of the biggest subsets of agriculture, that raising animals for animal products such as meat, milk, eggs etc.

As per 2012 census India has world's largest livestock of over 512.05 million animals. This includes 105.3 million buffalo population); around 140.5 million population of cattle and goats and over 72 million sheep population.<sup>[1]</sup>

At the same time India, produces around 19% of world's milk has a very large poultry market that contributes to over 63 billion eggs and over 650 million poultry meat

In order to gain the profit from this sector the practitioners of animal husbandry such as farmers must ensure wellbeing of the concerned animals. This includes regular visits to the veterinary doctors for check-ups, vaccinations etc.

As per Veterinary Council of India (VCI) there are 63,000 registered veterinarians in India; but total need in animal husbandry is around 1.1 to 1.2 lac.

To compensate the shortfall of veterinary doctors in India, AI application can be introduced in preliminary health checking of livestock. In order to train the AI interface application, there is a need of AI knowledge base. AI Knowledge base need to initially created and gathered and self-learned through experience as the system runs.

### 34. KNOWLEDGE REPRESENTATION USING YAML

Basic knowledge on Animal disease disorders are used to form AI knowledge representation. Animal husbandry diagnostics System should be user friendly and it will give suggestions to the user as a friend.

If some information which is not stored already during the training stage, then it will accept data from farmers and save it as AI knowledge and suggest a disease name the animal is suffering from.

AI knowledge could be used to provide AI messages as a suggestion to the farmers; like visit a doctor or some previous vaccination is left or to be given to the animal.

#### 3.1 A.I. INTERFACE

When system provides chat window to the farmers, A.I. Interface will automatically start the interactive communication between the farmer and itself.

Interface will first ask some questions, then farmer will give some input to the A.I. Interface, if the farmer provided information is new to the A.I. Knowledgebase of the A.I. interface then it will store it on to the knowledgebase for the future response and will look for a best match if not a new input then it will provide the solution from A.I. knowledgebase.

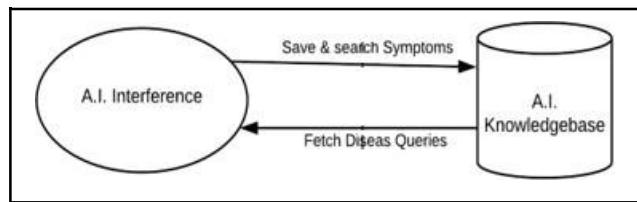


Fig. 1: AI Interface

### 3.2 AI KNOWLEDGE

For AI knowledge representation of animal husbandry YAML files are used instead of any other database files conventionally used that work with Structured Query Language (SQL)

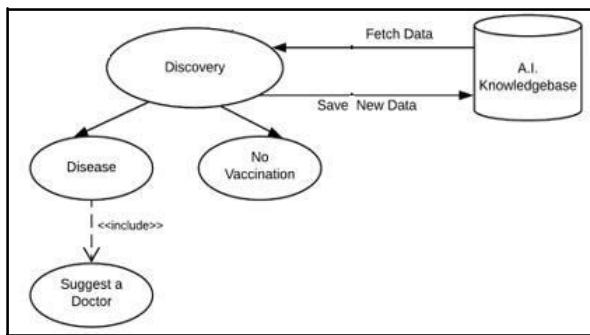


Fig. 1: AI Knowledge representation

AI knowledge base created during the training and execution phase becomes the knowledge source of the disease diagnostics. Farmers knowledge also considered to create new knowledge base during the life span of the system. AI knowledge base grow exponentially with all animal husbandry disease and its corresponding symptoms and concerned remedies to be taken care. This requires data representation in the format, other than relational database format. Data representation need to be done in conventional textual form, so that analysis and prediction algorithm of AI system can work effectively on the trained set of AI knowledge

#### 3.2.1 YAML FILES

YAML stands for Yet Another Markup Language. YAML(.yml) files are used effectively to represent AI knowledge for Animal husbandry disease, rather than conventional relational database tables. .yml files are textual files that can be used to store data as a string or plain textual data. It forms the information as conversations, where each one will be having its own id and corresponding values

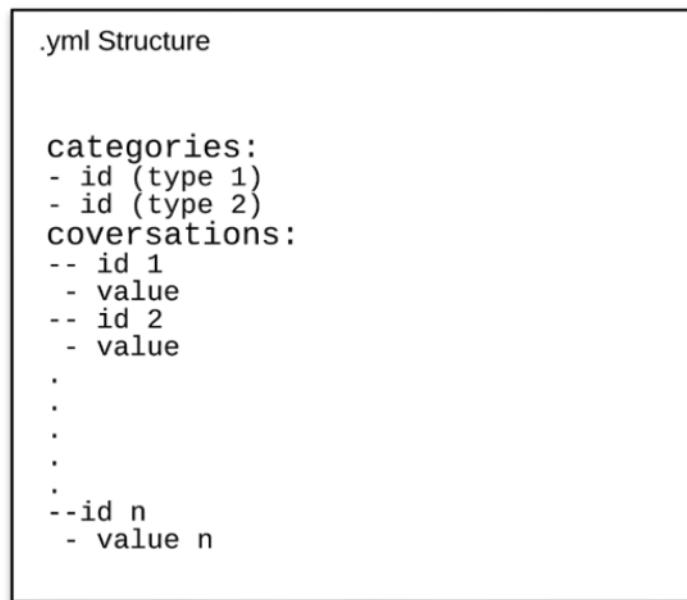


Fig. 1: Data Format of YAML file

- During the initial training period YAML file can be created for AI knowledge base creation for AI interface
- YAML files can be created using any word processing software, simply like a wordpad or notepad. The textual content can be saved with .yml file extension
- Both user and AI machines can read .yml file content very effectively and with ease, and it can traverse through the content too.
- AI interface during the chat with the farmer uses machine learning technique where AI interface will traverse through .yml file and identify the best outcome.
- Machine learning AI interface does not require complex code to locate the AI knowledge represented using YAML files
- Farmers may not be able to interact in correct grammatical sentences. So AI interface is designed to look for best match, which is done through YAML files

```

sample.yml

categories:
- AI
- artificial intelligence
conversations:
- - What is AI?
  - Artificial Intelligence is the branch
  of engineering and science devoted to
  constructing machines that think.
- - What is AI?
  - AI is the field of science which
  concerns itself with building hardware and
  software that replicates the functions of
  the human mind.
- - Are you sentient?
  - Sort of.
- - Are you sentient?
  - By the strictest dictionary definition
  of the word 'sentience', I may be.

```

Fig. 2: sample .yml file Data Design

### 3.2.1 AI TRAINING TO CREATE KNOWLEDGE BASE

YAML files are used as the initial source of knowledge representation, with the Animal Husbandry disease diagnostics information.

While farmers interact through AI interface new information will be created. The newly received information has been represented in YAML format initially.

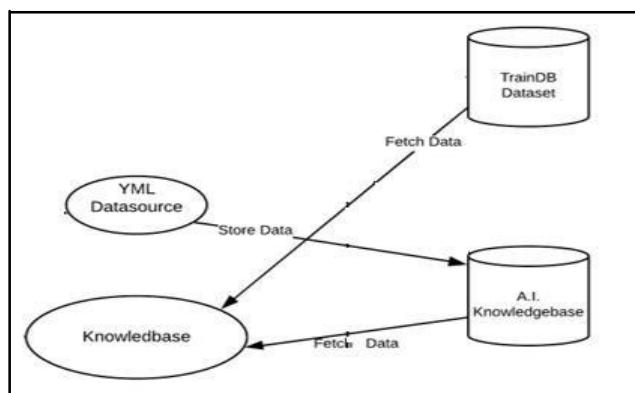


Fig. 2: AI Training using YAML file

Newly received disease diagnostics .yml files become the data source for representing the new knowledge, hence it forms AI knowledge source.

## **35. CONCLUSION**

This research work is to highlight the advantage of using YAML files over relational database for the training and creating AI knowledge base. Ease of creating YAML files, modularity of data structures in it and its compatibility with modern AI based programming techniques like Python, R etc makes it a good choice for AI applications.

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## Knowledge Management Perception Analysis in Indian Higher Educational Institutions

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### ABSTRACT

*Knowledge has been long cited as a strategic asset and a source of competitive advantage for organization and academic institutions plus with the advent of globalization the universities are also following a trend towards knowledge-orientation.*

*The main purpose of this study was to identify and assess the Analysis of the results as to assessment of the scope and implementation of KM practices in higher education system. This paper explains the results of analysis of the survey of the respondents from selected higher technical educational institutions, the assessment of the quality of higher education, the challenges faced by learners, as well as suggestions for improvement. The methodology involved both qualitative and quantitative research to evaluate knowledge management based on literature and personnel viewpoints in the higher education. Data from 440 participants were analyzed by using KruskalWallis, and Mann-Whitney test. The instrument used was a structured research questionnaire on knowledge management. The results imply that the higher education is following a trend towards knowledge-orientation. Our paper attempts to develop a relationship between KM and Indian Higher Educational Institutions. Furthermore, there was a significant difference between two groups (lecturer and staff) perception. Its implication can also be beneficial to other universities that plan to highlight knowledge oriented management.*

*Keywords:* Knowledge Management, Higher Education.

### SIROHI, ARUNIMA

Knowledge management is everything from the application of new technology to the harnessing of the intellectual capital of an organization (Sallis and Jones, 2002). It is not one single discipline rather it is an integration of numerous endeavors and fields of study (Rowley, 2000). Thus, it is nonetheless to say that KM is about the processes that govern the creation, dissemination, and utilization of knowledge by merging technologies, organizational structures and people to create the most effective learning, problem solving, and decision-making in an organization. Indeed, it's important to understand the relevant ways to improve quality in higher education institutions. Further, in the modern globalised world education sector is also facing the same kinds of pressures like in other areas of technology and advancements. The research is basically oriented towards the results and analysis of the survey of the respondents from selected higher technical educational institutions, the assessment of the quality of higher education, and the challenges faced by learners, as well as suggestions for improvement. This paper shows the assessment of the results and the implementation of KM practices in Indian higher education system.

### RESPONDENT'S PROFILE AND ORGANIZATIONAL PRACTICE

Responses been received from overall 440 respondents largely from academics and administrators with good years of experience in Indian Higher Education. Other cross-section of respondents included academicians from government institutes of national eminence; state government owned universities as well as Government and privately funded IHE institutions.

Exhibit 1A shows the profile of the respondents on basis of area of operations. The respondents working in sample institutions are fairly representative and suitable for the study since these institutes have undertaken for the specialized training or knowledge programmes attended by each faculty.

#### Exhibit 1A – Respondents Profile

Age Group(in years)	25-34	35-44	45-55	Above 55
%age	45.6%	37.2%	13.2%	2.7%

Highest Academic Degree	Post-Graduate	M.Phil	Ph.D.	Post Doctorate	Professional Degree
%age	41.0%	1.6%	32.7%	1.4%	22.2%

Present Position	Lecturer	Sr.Lecturer /Assistant Professor	Sr.Grade Assistant Professor	Reader	Associate Professor	Professor
%age	20.4%	62.6%	8.4%	4.4%	1.8%	1.6%

Subject Specialization	Management	Social Work	Technology	Others
%age	45.64%	22.94%	3.44%	27.52%

Teaching Experience (in years)	0-5	6-10	11-15	16-20	21-30	35 and above
%age	42.7%	27.3%	21.6%	0.7%	7.1%	0.7%

Work Place	University of Delhi	Jamia Millia Islamia	JNU	IGNOU	GGSIPU	AICTE & Others
Numbers	118	31	23	243	8	18

## KM – USE AND BENEFITS

In India higher education is one such area where the awareness to encourage the competitiveness for the faculties and institutions are being seen at least, because of which knowledge management is a strong concern. Institutions dealing with curriculum development processes can enhance the quality of programs, faculty development and other administrative services too. Further, in order to examine the best use of KM questionnaire is to get the opine of the respondents on not only the application aspect but also its interface with the industry. Results show that 30% respondents strongly agree that knowledge management is a bridge to develop an interface between the industry and academia. Over 60% respondents opined that that KM in higher institutions is only restricted to the research and knowledge creation and 42% agreed that KM best use is in the academics and can certainly reap the benefits.

## Exhibit 1B - ANNOVA on best use and applications of KM<sup>1</sup>

Respondents Classifiers >Parameters	F-Ratios						
	Age	Gender	Degree	Specialization	Experience	Place	Designation
Interface (A1)	0.743	0.114	1.549	1.168	0.975	2.314	1.144
Restriction (A2)	1.847	0.265	0.642	.555	0.721	2.416	1.082
Best Use (A3)	1.984	3.856	0.706	1.344	2.327	3.775	3.054

Also, ANNOVA results indicate that opinions on various parameters of KM intervention do not differ significantly across respondents groups, as to the best use of KM since maximum  $F_{0.05}=3.775$ (computed value)<4.7571(table value){Exhibit 6B}. It can be inferred that either because of differences in awareness level

<sup>1</sup> Appendix 2.

or visualization respondents may have mixed opinion as to the use of KM. Thus, it can be inferred that there is a small gap in the perception of KM across the universities possibly due to KM handling policies.

## KM AND INDIAN HIGHER EDUCATION SYSTEM

An indication of 24% respondents confirmed that Indian higher education system needs reformatting with 25% said that courses should be available with the global recognition. Further, another 28% agreed that the relevance of the programme for attaining global standards among government, private and international organization is relevant and also felt that the relevance of KM programme towards quality assurance in Indian higher education sector is with significant and impressive developments {Exhibit -1Q}.

### Exhibit 1Q – Opinion Results for Indian Higher Education System

Statements	Yes	No	Can't Say
	No. of respondents		
Does an Indian Higher education system needs reformatting	106	80	15
Do you think that the need for the courses/programs to be incorporated as per KM implications	111	65	25
In your opinion courses should be available with the global recognition	126	65	10
Does implications of KM would improve the work excellence	107	70	23
Do you think that the relevance of the programme for attaining global standards among government	82	105	13
In your view is the relevance of the programme towards quality assurance in Indian higher education sector	53	115	33

### Exhibit 1R – ANNOVA for KM and Indian Higher Education System<sup>1</sup>

Respondents Classifiers	F-Ratios						
	Age	Gender	Degree	Specialization	Experience	Place	Designation
Reformatting Need (D1)	.453	1.720	.800	2.275	.639	31.089	1.610
KM Implications (D2)	.910	.057	3.158	5.292	2.162	26.308	8.576
Recognition (D3)	.649	.050	2.110	2.418	.544	31.917	2.334
Excellence (D4)	.813	1.006	.909	.815	.452	7.479	1.615
Relevance (D5)	.293	.619	2.282	5.897	3.017	36.466	6.487
Quality (D6)	.320	.943	2.644	4.592	1.787	38.592	3.389

We find large difference in the opinion of respondents in relation to the place of work. Thus, it can be inferred that KM has been perceived like a revolution of the higher education in Indian scenario.

## QUALITY IN EDUCATION SYSTEM

In the opinion of 21% respondents, Higher Education have to adjust themselves and develop strategies to respond rapidly to the changes in markets, technologies and increasing demand of stakeholders and (30%) agreed that there is need for the expansion in the capacity of existing education institutions with this (22%) also added that our education system also suffers from multiple disparities. Further(18%) respondents said that all colleges should come under the fold of quality assessment to improve the standard of higher education in the country and (15%) added that there are deficiencies in the physical and academic infrastructure of the institutions(government, private aided and unaided). With this few of the respondents also partially agreed about the collaboration, sharing and application of knowledge which is not well understood and appreciated in institutions.

<sup>1</sup> Appendix 2.

## Exhibit 1S - Quality in Education System

Statements	Yes	No	Can't Say
Do you think that higher education have to adjust themselves and develop strategies to respond rapidly to the changes in markets, technologies, and increasing demand of stakeholders	96	89	16
In your opinion does collaboration, sharing and application of knowledge is not well-understood and appreciated in institutions	77	105	19
Is there any need for expansion in the capacity of existing education institutions	135	59	7
Does our education system suffer from multiple disparities	99	75	27
Does all colleges should come under the fold of quality assessment to improve the standard of higher education in the country	83	73	45

With this it could be said that quality of education effects various other parameters of life as well. In a country like India, where higher education is facing major challenges to adjust with the advent of technologies and increasing demand of stakeholders people are aware of the new needs and expectations. It is felt that with the kind of changes in collaboration the education system can move towards attaining quality. Further, it is more noticeable that Indian education system is suffering from multiple disparities and which could be one of the reasons for not fulfilling the criterias of quality in education system.

## Exhibit 1T- Ratings on Quality in Education System

Statements	Very important	Quite important	Somewhat important	Not very important	Not important at all
Relevance to context, to needs (both 'needs now' and 'needs later') and to humanity	66	65	15	24	30
Efficiency in setting standards, in meeting and in setting standards	113	132	50	79	66
Environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities	80	113	90	89	68
Learners who are healthy, safe, protective and gender sensitive provide adequate resources and facilities	26	12	1	1	?

In the scenario of higher we can more likely say that the students are the customers and it is the primary task of every higher education institutions to disseminate quality education in such a way so that they can be saleable in market. Therefore, a way so that the relevance and efficiency for setting the standards can lead to environments that are healthy and will be leading to adequate resources and facilities. Thus, it can be inferred that majority of respondents support for KM to improve quality and for giving standards through learning environment.

## Exhibit 1U- ANNOVA results on Quality in Education System <sup>1</sup>

Respondents Classifiers >Parameters	F-Ratios						
	Age	Gender	Degree	Specialization	Experience	Place	Designation
Strategies(E1)	.334	.612	2.419	2.066	1.217	35.736	2.065
Collaboration (E2)	.278	1.792	3.712	10.428	1.362	46.990	6.887

<sup>1</sup> Appendix 2.

Expansion(E3)	.378	3.642	2.414	6.293	2.073	39.854	1.416
Disparities (E4)	.628	1.837	5.467	5.482	1.444	32.400	6.399
Assessment (E5)	.666	.631	1.721	1.484	.549	33.435	1.192
Deficiencies (E6)	.364	1.113	.758	1.227	.543	26.712	1.067
Relevance (E8)	1.721	1.796	2.338	2.669	2.259	28.055	3.747
Standards (E9)	.667	.655	1.038	1.465	.799	2.659	2.496
Environment (E10)	1.001	.032	1.550	1.372	2.642	8.516	3.280

Results indicate that opinions on Quality in education system indicates that opinions on various quality measures in education system differ significantly across respondents groups classified for place of work and designation along with experience and any of their specialized training/knowledge programmes attended.

## Exhibit 1V- Counts on Training/Knlowledge Programmes

Name of the Programme	Percentage of respondents {No. of Programmes Attended}		
	Recently (within 1 Year)	Last 3 Years	3 Years Before
<b>Refresher/Orientation programme</b>	55.67% {1} 35.02% {2} 01.03% {4} 08.24% {5}	27.731(1) 16.807(2) 0.840(3) 8.247(4)	36.23(1) 23.19(2) 2.90(3) 23.19(5)
<b>Faculty Development Programme (External/Internal)</b>	0.274%(1) 38.356%(2) 36.989%(3) 11.781%(4) 12.603%(5)	1.53%(1) 15.3%(2) 21.5%(3) 18.4%(4) 1.53%(5)	55.56%(1) 4.44%(2) 4.44%(3) 17.78%(4)
<b>Seminars/Workshops/Conferences</b>	39.583%(1) 13.194%(2) 6.944%(3) 34.028%(4) 0.694%(5)	1.51%(1) 22.7%(2) 12.1%(3) 12.1%(4) 12.8%(5)	14.5%(1) 18.1%(2) 3.63%(3) 14.5%(4) 1.81%(5)
<b>Industry interaction</b>	0.685%(1) 8.219%(2) 10.959%(3) 5.479%(4) 0.685%(5)	19.231%(1) 1.538%(2) 0.769%(3) 13.077%(4)	0.730%(1) 7.30%(2) 5.84%(3) 24.09%(4)
<b>Others (pl. specify)</b>	2.041%(1) 4.762%(2)	2.685%(1) 5.369%(2)	100%

Results indicate that respondents who attended specialized Training/Knowledge programmes during an course of time within 1 year, last three years and before three years doesn't have much differed opinion for KM implications and their effectiveness at their institute level.

(55%) Respondents attended refresher/orientation programmes within one year, 35% in last two years . Number of respondents (27%)who attended FDP's within one year out of which 16% were such who attended the faculty development programme in last three years, respondents attending seminars/workshops/conferences within one year were 36% and in last three years the number varied from 23% . further, the respondents who had some industry interation recently in one year duration were 38% and in last three years it had a significant shift of 36%.

Therefore, the results are quite indicative that people who attended different knowledge programmes in duration of one, three and before three years their opinion differed accordingly to the duration on to which they attended such specialized training programmes.

## FACTOR ANALYSIS

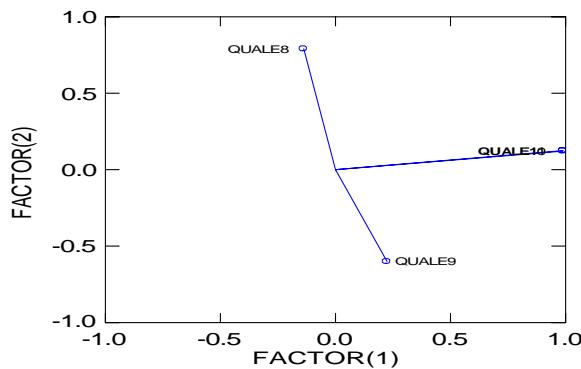
Factor analysis attempts to identify underlying variables or factors that explain the pattern of correlations within a set of observed variables. factor analysis is often used in data reduction to identify a small number of factors that explain most the variance observed in a much larger number of manifest variables.

Measuring willingness to share knowledge and processes of knowledge management in a questionnaire directed to an institute certainly is a difficult task. Most of the interviewees, however stated that they had studied Knowledge management related issues in their education sector regularly.

17 statements were used in order to determine the willingness to knowledge management implementation processes. Responses were measured along a five-point Likert scale. Respondents had to indicate to what extent they thought that the corresponding item described the situation in their respective institutions. The higher the value they assigned to an item, the more they agreed that this item described the situation in their institutions. In order to ease the interpretation , this relatively large number of variables was reduced to a number of underlying factors using the statistical method factor analysis.

The method used for factor extraction was principle components. The interpretation of factors is an important although a difficult step in factor analysis as there remains room for subjective assessment.

Factor Loadings Plot

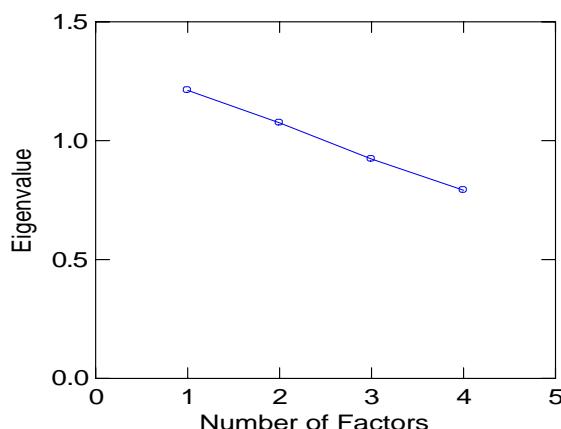


Results indicate that the extracted components(1 & 2) together explain 75.92% of the variance. The component loading indicate that QUALE10 and QUALE11 variables are significant.

Therefore, it can be inferred that environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities .

Learners who are healthy, safe, protective and gender sensitive provide adequate resources and facilities

Scree Plot



Also 57% of the variance is explain by the extracted components of variables KMIB1-KMIB4. It may be inferred that B1 and B2 are important.

## CONCLUSION

For knowing the views of academics who had fair experience about the Indian Higher Education System, a questionnaire was developed specially to examine whether the Indian academia also believed that IT based KM interventions could be applied to Indian Higher Education institutions for their benefit and with this the order of priority of each intervention. The questionnaire was sent generously for response. The analysis of 441 responses received who were largely academics with years of experience in IHE System and also academic administrators. Wholly the cross-section of respondents included persons from government institutes of national eminence to state government owned universities as well as Government and privately funded HE institutions. The results were since significant at 95% confidence level, on the whole it represented the Indian opinion fairly.

Results proven that a far sighted planning at Institutional level, supported by good R&D as well as Curriculum Development activities are important quality parameters in any institution of Higher education looking forward to a satisfied stakeholder base in Higher education System. A concerned and sensitised institutional administration towards the special needs as its immediate constituents as well as stakeholders, is also an essential requirement of a quality conscious Higher Education System. From the results discussed above, IT based Knowledge Management Interventions seem to be promising for techno-management tools to help cast an impact over all the vital areas of the IHE System viz. Institutional planning, Curriculum Development Process, etc. the identified interventions in selected areas are if taken up by appropriate agencies viz. Governmental(for policy making) and institutional(for implementation), are bound to rationalize the investment in higher education system as well as lead to more responsive Higher Education System with optimized resources utilization. These modern interventions of IT based KM could also lower the overall investment in the existing higher education system by carefully identifying the key areas where these interventions could be applied.

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## Machine learning approaches in drug development of Leprosy

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### ABSTRACT

*Machine learning technologies can be used for drug delivery and development of infectious disease like leprosy. These methods of computation will give new hope to enhance the quality of life of leprosy infected persons. These methods are less time consuming and easy to interpret than wet lab techniques.*

**Keywords:** Drug, Machine Learning, Virtual Screening, Computational Method.

**Abbreviations:** Virtual Screening- VS. structure based virtual screening - SBVS, ligand based virtual screening - (LBVS)

### 1. INTRODUCTION

Leprosy is a chronic infection that affects the skin, mucous membrane, and nerves, and causes discolouration, lumps, disfigurement and deformities in skin and mycobacterium leprae is the bacteria that causes leprosy also known as "Hansen's disease", which is a chronic infectious disease that damages the peripheral nerves and targets the skin, eyes, nose, and muscles. [1]. How mycobacterium leprae causes leprosy is explained by Victoria [2] et.al in Lepr Rev ( 1999) 70.,

Leprosy is a disease that can occur at all ages from infancy to elderly, but is curable in which treatments can avoid permanent disabilities[3] It was discovered in 1873 by Gerhard Armauer Hansen, who was searching for the bacteria in the skin of patients with leprosy. The first bacterium to be identified as causing element for this disease in human is mycobacterium leprae [4].

Medieval skeletons with osteological lesions are the indicators that the leprosy was firstly originated from different parts of Europe geographic and these data were captured using DNA techniques and throughput sequencing. Later these sequences were compared with those of modern strains from biopsies of leprosy patients representing diverse genotypes and geographic origins, giving new insights in the understanding of its evolution and course through history, phylogeography of the leprosy bacillus, and the disappearance of leprosy from Europe.

Basically the genes and immune function of person play major role in how easily a person catches the diseases.[5][6]

### 2. METHODS AND DISCUSSION

Innovation of machine learning techniques [7] have been a source to development of algorithms that has improve their performance in understanding various pattern, classification, regression and prediction based on the models that are derived from the data which pre-exist. It has a very close relation to data mining as pattern recognition is termed as one of the important area of research in both. One of the algorithms that is used is classification which is mostly used to identify active and inactive compounds whereas regression method is applied in training and testing continuous data.

To find and develop the drug that can help in eradicating leprosy machine learning method have been widely used in quantitative structure activity relationship, ligand based virtual screening, in-silico ADMET (Adsorption, Distribution, Metabolism, Excretion and Toxicity) studies.

The computational based cheminformatics software that are used for target identification are Modeller, chem. sketch, DRAGON, MOE, VMD, AUTODOCK etc. Machine learning technique helps to identify the best suited model. Structure activity relationship helps to find the potential target for drug delivery and drug discovery.

Machine learning techniques are widely used in virtual screening of cheminformatics spectrum. Large database for new leads with high probability can be done with the help of virtual screening(VS). There are two version of VS one of them is structured based virtual screening(SBVS) and the other ligand based virtual screening(LBVS) depending on amount of structural and bioactivity data available. SBVS is used when 3D structure of receptor is known [8] but if the information about the receptor is limited then LBVS method is adopted. There are number of medicines which have been invented to cure leprosy but it takes time and continent such as ASIA are having large number of leprosy people and this is due special character of recombination and sudden & rapid mutation so it is very essential to formulates medicines for curing leprosy at very early stage so that it cannot be spread as it is contagious also. However, the method to formulate medicines need clinical trials so that combinational methods with molecule basis of leprosy proves much better result.

These methods need clinical trials but drug designing with combination of computational methods with molecular basis of leprosy proves better results. Here are some of the machines learning approaches that are widely used with computational methods.

## 2.1 SUPPORT VECTOR MACHINES

Support and vector machine was developed by Vapnik [9][10] and the co-workers monitored machine learning algorithm for compound classification and binary classification. When the two classes of compound in binary classification is separated by hyper plane as shown in the below figure 1: During the analysis it is observed that hyper planes are developed and SVM chooses the hyper plane that maximize the margin between two classes. During this analysis it is also assumed that larger margin will lower the error of the classifier when dealing with unknown data. Such hyper planes are called support hyper planes (dash line in figure 1) while data points which lie on hyper planes are called as support vector (blue and red dots in figure 1). During the consideration high dimensionality feature space of SVM kernels are preferred. Following are the types of kernels are mostly used;

1. Linear
2. Polynomial
3. Sigmoid
4. Radial basis(RBF)

The first three kernels are global while RBF is a local kernel. Binary property or activity prediction is done using SVM which helps to distinguish between drugs and non-drugs [11][12] or between compounds that have or do not have specific activity[12-14] synthetic accessibility is also an important criteria[15]

Basically SVM are used for binary property or activity prediction i.e. to distinguish between drugs and non-drugs[10,11] or between compounds that have or do not have specific activity[11-13] synthetic accessibility is also an important criteria or aqueous solubility.[14]

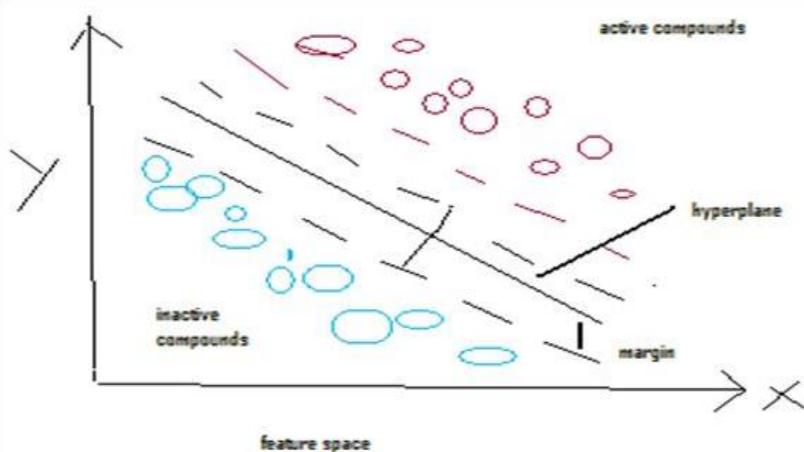


Figure 1. Hyper plane separation of two objects.

## 2.2 Decision Tree (DT)

Figure 1 above represents DT which has its root at the top and the leaves at the bottom. DT basically split from a single trunk into two or more branches, this process continues until a leaf is reached which could not further split. The internal node of the tree is the split of the branch and each leaf node is assigned with a target property whereas a non-leaf node is assigned molecular property.

Classification of compounds into drugs and non-drugs [16] ADME-TOX properties [17–20] and metabolic stability [21] These models are simple to understand, interpret and validate. A moderate data size is recommended to avoid over fitting.

## 2.3 Naive base classifier

This classification is based on Byes theorem which gives computational values describing the probability of an event that might have been result of two or more causes [22]

$$p(a/b) = \frac{p(b/a)p(a)}{p(b)} \quad \text{Equation (1)}$$

The equation above shows the probability “p” for state “a” existing for a given state “b”. Bayesian theorem helps to understand that probabilities of occurring new things depends upon existing knowledge. Hence this theorem is mostly used in chemo informatics both generally for predicting biological rather than physicochemical properties, prediction of toxicity of compound, protein target, bio active classification for drug like molecules [23,24] (v) k-Nearest neighbours: it is one of the simplest algorithms.

## 2.4. Artificial neural networks(ANN)

It is also called as connectionist system which is a computing system inspired by the biological neural networks that constitute animal brains [25]. Collection of connected units or nodes are referred as ANN. Synapses in a biological brain, can transmit a signal to other neurons. An artificial neuron that receives a signal then processes it and can signal neurons connected to it. The main objective of ANN approach was to solve problems in same way that human brain does.

## 3. CONCLUSION

**Developing drug for leprosy is difficult task as *M. leprae* has the longest doubling time of all known bacteria and has thwarted every effort at culture in the laboratory. Machine learning cutting edge technologies would provide sound effect in drug development as comparative analysis can be done in less span of time. Studies show that SVM is good then other machine learning techniques for disease identification. Vaccines can also be developed for infectious diseases like leprosy based on identifications from MLT.**

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## Applications of Robotics in Healthcare

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### ABSTRACT

*Robots are everywhere, they are making a big impact on the field of medicine and healthcare. Robotic surgery is a type of minimally invasive surgery, i.e. instead of operating on patients through large incisions, miniaturized surgical instruments that fit through a series of quarter-inch incisions are used. The requirement was to give the surgeon unprecedented control in a minimally invasive environment. Using this technology, our surgeons are able to perform a growing number of complex urological, cardiothoracic and general surgical procedures. Since these procedures can now be performed through very small incisions, our patients can get a number of benefits compared to it, including less trauma, less caring and Faster recovery time. They can also perform accurate surgery in very small places and transport dangerous substances. This paper gives an idea about surgical and non-surgical robots, the advantages and disadvantages of robots in medicine and healthcare, their impact on present medical practices and also the future of robotics in healthcare.*

*Keywords: robotics, healthcare, surgical robots, medicine, robotic surgery.*

### 1. INTRODUCTION

#### Origins of Robotic Surgery

The first use of a robot-assisted surgery was done in 1985 when the PUMA 560 robotic surgical arm was used in a delicate neurosurgical biopsy, a non-laparoscopic surgery. The robotic system allowed for a successful robotic surgery and the potential for greater precision when used in minimally invasive surgeries, such as laparoscopies which typically utilize flexible fiber-optic cameras. The 1985 robotic surgery leads to the foremost laparoscopic procedure involving a robotic system, a cholecystectomy, in 1987. The subsequent year the same PUMA system was used to perform a robotic surgery transurethral resection. In 1990 the AESOP system created by Computer Motion became the first system approved by the Food and Drug Administration (FDA) for its endoscopic surgical procedure.

In 2000, the da Vinci Surgery System became the first robotic surgery system approved by the FDA for general laparoscopic surgery. This was the first time the FDA approved an all-encompassing system of surgical instruments and camera scopic utensils. Its predecessors relied upon the use of endoscopes and many surgical assistants to perform surgery. The da Vinci robotic surgery system's three-dimensional magnification screen allows the surgeon to view the working area with the accuracy of high resolution. The one-centimetre diameter surgical arms represent a significant advancement in robotic surgery from the early, large-armed systems such as the PUMA 560. With such miniaturized operating arms, the da Vinci robotic surgery system removes the need to leverage the sides of the incision walls.

The da Vinci System has been approved by the FDA for use in both adult and pediatric robotic surgery procedures in the following areas:

- Urological surgeries
- General laparoscopic surgeries
- General non-cardiovascular thoracoscopic surgeries
- Thoracoscopically-assisted cardiotomy procedures

Robotic surgery has developed into a successful option in neurological, urological, gynecological, cardiothoracic, and numerous general surgical procedures.

### 2. SURGICAL ROBOTS

The da Vinci surgical system is a market leader<sup>[8]</sup>, but other options are up-and-coming, including models for specific procedures.

## a. *Da Vinci*<sup>[8]</sup>

In 2008, NYU Langone became the first medical center in New York and New Jersey to begin using the da Vinci Si, the world's most highly developed computer-assisted surgical system.



Figure 1: Da Vinci Surgical Robot

## *How the da Vinci Si Works*

The da Vinci Si has two separate but connected sections:

1. **The tower**, which is positioned directly over the patient during surgery, contains the robot's four arms—three that can hold a large number of various surgical instruments, and a fourth that holds the system's 3-D cameras. These arms are controlled by a computer that exactly performs the actions of the operating surgeon.
2. **The console** is where the surgeon sits and operates the robot's controls while looking into a stereoscopic monitor that provides a magnified, high definition 3-D view of the surgical site. The surgeon manipulates the robot's four arms by way two master controls that provide near exact precision of consideration area.



Figure 2: The tower of da Vinci Robot

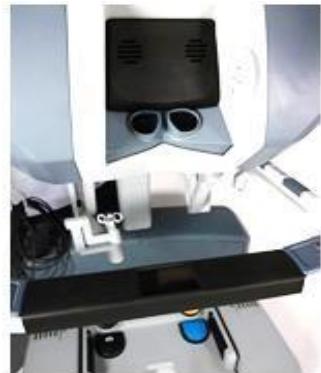


Figure 3: The Console of da Vinci Robot

## *How Does the da Vinci Si Help Surgeons?*

The da Vinci Si has a number of new surgeon-friendly qualities that make surgical procedures easier and more well-organized like 3-D high-definition vision, An additional arm, Instant image referencing, Extra-mobile 'wrist action' and Scalability<sup>[8]</sup>.

## b. *The CorPath System*

The difficulty for people living in remote areas is getting access to critical medical care, especially with a lack of skilled surgeons at the local hospital. Providentially, robotics with other technologies such as virtual reality (VR) is serving surgeons practise.

In a present case in India, a cardiovascular surgeon did a 15-minute process on a patient who was about 20 miles away. The doctor used the system to put in a stent into the patient at the same time as operating the robot from afar and monitoring the development on a display.

Remotely controlled surgical robots can facilitate patients who are too ill to be transported to a place where a specialist surgeon is accessible.

### **c.The CorPath System**

The Monarch is a surgical robotics that incorporates flexible robotics, micro-instrumentation, data science, and other technologies for curative and diagnostic bronchoscopic procedures. Monarch platform integrates endoscopes, instruments, navigation, and robotics into a single platform, allowing physicians to better perform endoscopic interventions.

### **d.The Mako Rio**

The Mako Rio is the first robot permitted for the knee. The Mako Rio makes a 3D model of the procedure based on the patient's CT scan and provides real-time response as the surgeons use special instruments.

### **e.The Versius**

Versius, unlike other surgical robots, performs laparoscopic surgeries, also known as keyhole procedures. Human surgeons need about 80 hours of instructions to learn the manual method of laparoscopic suturing. This can be done in about half-hour with the Versius.

These examples emphasize how surgical robots are building things promising that surgeons likely didn't even dream about some years ago.

Even as quick as technology is evolving, surgeons don't need to worry about robots taking over their jobs. Subsequent to all, even in the case of the remote surgery mentioned above, humans are always guiding the surgical robots and specifying what actions they take. Their supervisory will always be required for success.

## **3. NON-SURGICAL ROBOTS**

Surgery is the most normally discussed robotic request in healthcare, and perhaps the most successful so far. Other areas in healthcare that are starting to use robots include telepresence, rehabilitation, medical transportation, sanitation, and prescription dispensing.

Below are six top uses for robots in the field of medicine today.<sup>[6][7]</sup>

**1. Telepresence** Physicians use robots to assist them scan and treat patients in rural or remote locations, giving them a "telepresence" in the room. A robotic surgical system controlled by a surgeon from a console.

**2. Surgical Assistants** These remote-controlled robots help surgeons with performing operations, minimally invasive procedures additional applications for these surgical-assistant robots are repeatedly being developed, as more sophisticated 3DHD technology gives surgeons the spatial references required for highly complex treatment centre, including more enhanced natural stereo visualization, along with augmented reality.

**3. Rehabilitation Robots** These have a vital role in the revival of people with disabilities, including better mobility, strength, coordination, and quality of life. These robots can be programmed to familiarize to the situation of each patient as they recover from strokes, traumatic brain or spinal cord injuries, or neurobehavioral or neuromuscular diseases

**4. Medical Transportation** Robots Supplies, medications, and meals are delivered to patients and staff by these robots, thereby optimizing communication between doctors, hospital staff members, and patients.

**5. Sanitation and Disinfection** Robots with the increase in antibiotic-resistant bacteria and outbreaks of deadly infections like Ebola, more healthcare facilities are using robots to clean and disinfect surfaces. These robots can sterilize a room of any bacteria and viruses within minutes.

**6. Robotic Prescription Dispensing Systems** Robots are good with speed and accuracy and so. automated dispensing systems have robots that can handle powder, liquids, and highly viscous materials, with much higher speed and accuracy than before.

## **4. ADVANTAGES AND DISADVANTAGES OF ROBOTS<sup>[4]</sup>**

### **Advantages:**

#### **1. Smaller Incisions and Less Trauma**

The nature of robotic surgery is less invasive, which means the patient experiences less pain and quicker recovery time. The surgical arms are often pneumatic, powered by compressed air and electricity to control the

operation. The 'hands' of each arm, which hold each of the necessary surgical tools, are also smaller than human hands, which eliminates the need for large incisions. The surgeon remains in the operating room throughout the procedure. A team of nurses also monitors the patient during the process.

Surgeries that normally result in a week-long post-operative hospital stay can potentially become outpatient procedures.

## **2. Higher Surgical Accuracy**

Some surgeries — from orthopedic operations to neurological procedures — require a high degree of accuracy. One slip of the scalpel or misplaced set of forceps can cause damage or even result in the death of the patient. Robotic surgery robots aren't susceptible to the shaking or other strain-related movements a human surgeon might experience. If the controller's hands are shaking, the machine's software compensates for that movement, so it doesn't affect the surgery.

Each robotic hand can rotate 360 degrees multiple times, something that human hands can't do. This increases their range of motion. It is equipped with small joints that allow each arm to bend like a human wrist. This is an improvement over traditional laparoscopic tools, which are straight and unable to bend so they are harder to manipulate. It is also equipped with a 3D high definition camera, providing a better view of the surgical site than would be available otherwise, even during open surgery.

## **3. Reduced Surgeon Fatigue**

Surgeries, specially ones that take multiple hours, are exhausting for the attending surgeon. The team is on their feet for hours at a time, completing the surgery and attending to the patient. Surgical robots allow the surgeon to sit comfortably while operating.

This could help keep surgeons fresh and aware for the duration of their surgeries, preventing fatigue-related errors and reducing the potential for medical malpractice.

## **DISADVANTAGES:**

### **1. The Expense of Surgery**

Surgery is an expensive proposition at the best of times. The high cost of installing a robotic surgery system can increase the cost of a surgical procedure. Surgical robots are costly to maintain, and their operation requires additional training, which is also expensive. Exact numbers are difficult to come by, but in general, a surgery utilizing a da Vinci surgery robot will cost between \$3,000 and \$6,000 more than a traditional laparoscopic procedure.

### **2. Movement Latency**

One of the most important problems with robotic surgery is the issue of latency — the time it takes for the robot to carry out the surgeon's commands. It takes a few moments for the computer to communicate with the robotic arms. While this is not an issue for routine surgeries, it makes it difficult for surgeons to respond quickly to problems that occur during the operation.

### *Scenario in India*

At present, India has over 50 surgical robots and a pool of over 300 trained robotic surgeons. About 700 robotic-assisted surgeries a month are conducted in the country. "In late 2011, we entered the Indian market with only eight to nine robots and with hardly any procedures. The market perceived the systems to be very expensive and surgeons felt that it can take a lot of effort for them to understand and master it. Now, we have seen tremendous progress in the status of robotic surgery in the country as well as a change of perception in the market. Many surgeons are really fascinated about technology and have come forward to learn it.

### *Surgical robots don't replace surgeons but aid them*

The long development times, safety requirements, and costs of surgical robots have already led to some consolidation

## **5. FUTURE MODELS**

Advanced robots continue to be designed for an ever-expanding range of applications in the healthcare space. For example, a research team led by Gregory Fischer, an associate professor of mechanical engineering and robotics engineering at Worcester Polytechnic Institute, is developing a compact, high-precision surgical robot

that will operate within the bore of an MRI scanner, as well as the electronic control systems and software that go with it, to improve prostate biopsy accuracy.

To develop robots that can work inside an MRI scanner, Fischer and his team have had to overcome several significant technical challenges. Since the MRI scanner uses a powerful magnet, the robot, including all of its sensors and actuators, must be made from nonferrous materials.

In other research, virtual reality is being integrated with rehabilitation robots to expand the range of therapy exercise, increasing motivation and physical treatment effects. Exciting discoveries are being made with nanoparticles and nanomaterials.

## 6. CONCLUSION

According to a recent report by Credence Research, the global medical robotics market was valued at \$7.24 billion in 2015 and is expected to grow to \$20 billion by 2023. A key driver for this growth is the demand for using robots in minimally invasive surgeries, especially for neurologic, orthopedic, and laparoscopic procedures.

With the right expertise and technology, the advantages can eventually overcome the disadvantages. Communication latency is currently the biggest hurdle to overcome to allow this technology to hold a more prominent place in the medical community. Even if the cost of the procedure slows down the integration in hospitals, surgeries with robotic machines will continue to become more commonplace, allowing more precise microsurgeries with improved accuracy.

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## Artificial Tissues

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### ABSTRACT

*A printable human tissue is artificially developed using 3D printing method. There is a need to print these artificial tissue so that they can be used for transplantation. One of the main purpose is also to check whether a particular drug work on the human body. Developed drug are usually tested on animals, but it is of no use because they are not the one who are going to consume those drugs. So this paper provides the solution for testing drugs on human body.*

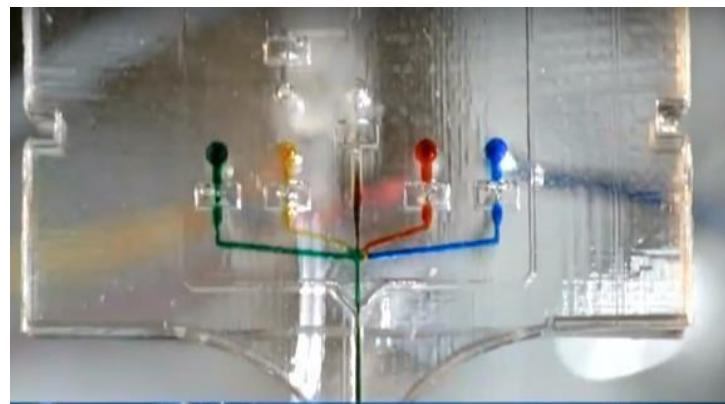
**Keywords:** 3D Bio printing, Human Tissue, Drug, Healthcare, Tissues

### 1. INTRODUCTION

Every day innumerable people are suffering and dying from disease. The reason behind this is life-saving drugs frequently fails. In fact, major percentage of new drugs that show promise in the lab or on animals fail in humans. As drug was shown to be safe and effective in animals, the drug company was given the green light to begin human trials. Developing a safe and effective drug is a risky, time-consuming and expensive process. It takes several years and big sum of money to develop just one drug that works in humans. Every human body is unique so the drug might work on some and not necessary for others. On human body drugs cannot be directly tested neither experiments can be performed. The solution to this problem is that we can develop human tissues outside of their body [1]. By doing this we can determine if drug is safe and effective before the testing is done on human. For this we can combine engineering and biology to rebuild different parts of internal body by combining different disciplines and collaborating using 3D printing technology. 3d printing Technology could print tissues which are real living human tissues.

### 2. 3D PRINTING OF HUMAN TISSUES

For printing 3D model, first the designing of 3D computer model of tissues is done and then it is printed layer by layer using a machine called a 3D Bio printer. Instead of using plastics and other non-living materials as used in standard 3D printing, real living human cells are used. These cells are combined with scaffolds to provide a suitable and comfortable environment for our cells to grow. These cellular materials then become our inks that we use in conventional desktop printers. This creates a basic building blocks which are ready to construct a tissue. As tissues are composed of many different building blocks there is a need to handle many different materials at once. Automation is done by shrinking them down to one simple chip called lab on a printer. [2] Bio printer uses this lab on a printer to deposit living inks. [3] Lab on a printer allows us to take multiple living inks and deposit combinations of these on the fly through a single nozzle to rapidly develop living structures [4].



*Fig. 1: Lab on a Printer*

As shown in the figure 1, Lab on a printer is depositing many different materials at once. the blue red yellow and green materials could represent different cell types different growth factors different components that make up tissues inside of our body. [5] Lab on a printer then deposits these living inks layer by layer to construct a

living structure. Immediately after printing, these tissues are put into an incubator which recreates the conditions inside of our body. After a couple days because we provided a suitable and comfortable environment tissues grew and they begin to talk and communicate and form interconnected networks [6]. The 3Dprinted structure has now transformed into human tissue as individuals.

### 3. CONCLUSION

3D Bio printer can construct an entire organ that would be made up of your own cells. Bio printing will enable us to accurately determine the human response to drugs this means is that we could eliminate drugs that won't work in human's sooner and take drugs into human trials with a higher chance of success this will also reduce our reliance on animal testing ultimately we'll end up with better safer and cheaper drugs.

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## A Study of Satisfaction Level of the Passenger Traveling by Air India after Joining Star Alliance

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### ABSTRACT

*This paper talks about the problems faced by passengers while traveling by Air India and the satisfaction level of the passengers Air India. This research also provides the insight of the problem and give suggestions to overcome the problem. This study provides the information of suggestion which can be adopted by Top Airlines to enhance passenger journey, which can increase the market share of Air India.*

*Keywords:* Air India, Passengers and Star Alliance

### 1. INTRODUCTION

#### 1.1. Introduction to Air India

Air India is the banner bearer airline of India. It is the third largest domestic airline in India in terms of passengers carried, after IndiGo and Jet Airways with a market share of 13.1% as of March 2018.

It is possessed via Air India Limited, a Government of India enterprise, and works a fleet of Airbus and Boeing aircraft. Air India has 176 Aircraft. It has headquartered in New Delhi.

Air India has its main hub at Indira Gandhi International Airport, New Delhi and a secondary hub at Chhatrapati Shivaji Maharaj International Airport, Mumbai.

Air India became the 27th member of Star Alliance on 11 July 2014.

#### 1.2. Introduction to Star Alliance

Five airlines made Star Alliance as the primary worldwide aviation alliance in 1997. Regardless we're spearheading – committed to advancement and phenomenal client assistance, with a reputation of progress. In this way, the clients experience the best of the two universes: outright unwavering quality combined with consistent development.

Today, Star Alliance has 28-part airlines, each with its own unmistakable culture and style of service. Alliance individuals meet up to offer smooth associations over a huge worldwide system. A venture organization situated in Frankfurt, Germany, facilitates Star Alliance exercises. These incorporate co-areas at airports, framework, correspondence activities and different services to improve your movement experience.

### 2. REVIEW OF LITERATURE

- **Malyadri P and Satyanarayana P (2014)**, "Service Quality Perceptions of Domestic Airline Costumers in India – An Empirical Study." Through this research study, the researcher concluded Kingfisher Airlines and Indigo Airlines are the Leaders when contrasted with Air India, Jet Airways, Spice Jet and Go Air in the Services offered to the clients with top appraisals in the Services blend factors, accordingly these two airlines are adjusting to the Customer Satisfaction to a degree.
- **Saha and Theingi (2009)** pointed out that the emergence of low cost airlines has raised concerns on how to satisfy the customers with the services are provided.
- **Chang and Keller (2002)** argue that quality in airline service is difficult to describe and measure due to its heterogeneity, intangibility, and inseparability, and only the customer can truly define service quality in the airline industry.
- **Dennett, Inesoan, Stone, and Colgate (2000)** suggest that as rivalry made by deregulation has gotten progressively extraordinary, service quality in the airline business has likewise gotten more consideration. Airline organizations additionally endeavored to separate their services using modernized reservation frameworks which were likewise intended to make client dedication in the dispersion channels.

- **Parasuraman, Zeithaml and Berry (1988)** were the pioneers in the conceptualization of the service quality build, these creators kept up that the general perception of quality was a disconfirmation of a client's desire and assessment of a services conveyed.

### **3. RESEARCH METHODOLOGY**

#### **3.1. PURPOSE OF THE RESEARCH**

Air India market share is 13.1% in domestic sector where as Indigo Airlines has 40.9% market share.

Air India operates 102 destinations with 176 Aircrafts it has a market share of 13.1% as on March 2018 where as Indigo Airlines operates with 86 destinations with 172 Aircrafts and has market share of 40.9% as on March 2018.

#### **3.2. OBJECTIVES OF THE RESEARCH**

- To know the satisfaction level of passenger traveling by Air India
- To assess the service quality provided by Air India
- To understand the impact of Star Alliance in terms of customers preference to fly with Air India

#### **3.3. METHODS OF DATA COLLECTION**

- **Primary data** is collected through questionnaire filled by the Air India passengers.
- **Secondary data** is collected from Journals, Magazines, Newspapers, DGCA website, Star alliance website and Air India websites

#### **3.4. RESEARCH DESIGN**

The research design deployed was exploratory research design. It is descriptive in nature.

#### **3.5. DELIMITATIONS OF THE RESEARCH**

The research is conducted on 100 Air India passenger.

#### **3.6. LIMITATIONS OF THE RESEARCH**

The research has physical and economical constraint.

#### **3.7. DATA ANALYSIS METHODS**

Data is collected from Air India passengers to generalize the findings and draw conclusions of the research study.

### **4. FINDINGS**

- Joining Star Alliance have increased in passengers, increase in the profit of Air India and Air India can serve many sectors with the code sharing after joining Star Alliance
- 58% of the passengers feel the fare of Air India is affordable, 9% and 13% of the passengers feel that the fare is cheap and competitive respectively on the other hand only 20% of the passengers think that the fare is expensive.
- 61% of the passengers feel that the departure and arrival time of the Air India is punctual, 30 % are satisfied with the punctuality and only 9% of the passenger had problem related to the departure and arrival.
- 65% of the passengers liked ground service proved by Air India only 5% of the passengers are not satisfied with the ground service.
- 72% of the passenger feel that the operations of Air India are very efficiently handled only 3% of the passenger feel that the efficiency is not as per the expectation.
- 78% of the passengers liked the interior of the aircraft and feel that the aircraft is comfortable and only 6% of the passengers are not satisfied with the interior of the aircraft.
- 19% of the passengers feel that the service provided by the cabin crew is excellent, 51% of the passengers feel the cabin crew services are good, 26% of the passengers feel that the cabin crew services are satisfactory and 4% of the passengers are not satisfied by the services provided by the cabin crew of Air India.

- 69% of the passengers are happy with the quality of food and beverages provided in the journey by Air India and only 5% of the passengers are not satisfied with the catering services of Air India.
- 80% of the passengers feel that the cleanliness and the hygiene in the aircraft is very good and only 4% of the passengers have negative view related to cleanliness and hygiene.
- 94% of the passengers feel that personal attention was given to the passengers by the Air India employees and only 6% of the people feel that personal attention is not given by the employees while traveling.
- 67% of the passengers are happy with the promotional and loyalty programmes given by Air India and 10% of the passengers are not happy with the programmes.

## 5. CONCLUSION

Joining Star Alliance had a positive impact on Air India as the company can provide good service and can connect to 193 countries after joining Star Alliance. Air India after been in loss for so many years have started reviving with getting profit from last 2 years. This was possible only because of Star Alliance. Air India pricing strategy is good which is liked by the passengers as they provide food and beverages onboard free of cost. Services provided by the ground staff is also good, but they need more training to be well versed with all the entries required to handle different situations. The cabin crew services provided by the airlines is liked by the passengers. Food and beverages given by Air India is of international standard, good taste and of quality. We can also conclude that personal attention is given by the Air India employees to the passenger traveling by the Airlines also many other connecting flight passengers are also treated well, personal attention is given to solve their problem and to make their journey happier and safe. The aircraft used by the airlines are maintained properly according to the ICAO and DGCA norms. The interior of the aircraft is good, entertainment onboard is also available on all the sectors of Air India. Cleanliness and hygiene are maintained properly in the aircraft. Passengers avail and like the promotional offers and loyalty scheme programmes of Air India.

## 6. SUGGESTIONS

- Air India should concentrate on domestic market as many of the domestic airlines in India are facing serious problem which will act as an opportunity for Air India.
- Air India should try to concentrate on international sectors also as many of the sector which was not profitable has been cancelled, but now there is a good opportunity for it as the competition in the domestic market has reduces. Some of the leading airlines in India are closing their operations.
- Air India should improve the service quality and try to match it with the international airlines service standard given by top airlines like Singapore Airlines, Emirates, Etihad, Thai Airways Lufthansa etc.
- Interior of old aircrafts should be renovated by the airlines and with latest equipment's like LED Televisions, onboard wifi, LED lighting for to reduce the fatigue of the passengers while traveling.
- Air India should employ some experts from top airlines as top-level managers so that they can use their experience and prepare appropriate strategy to make the airlines more profitable. As Air India is a government undertaking company all the CMD and top-level managers are government official and they are not expert in the field of Airlines sector which could be the problem solve the various situation related to Airlines Industry

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## Menstrual Hygiene- Awareness & Issues

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### ABSTRACT

*There is a huge information gap about menstruation among young women. This research is carried out in order to understand what the level of awareness regarding what menses is. The purpose of this study is to analyse the familiarity that women have with respect to menstruation and the procedures followed to maintain hygiene. Menstrual cycle is commonly considered as unclean in the Indian culture. This research also studies the awareness among women about menstrual hygiene. This is a descriptive study that analyses the awareness. The method used in order to collect primary data is questionnaire along with polls (carried out via Instagram). The survey and polls were conducted in the region of Mumbai. Secondary data was referred to as well in order to analyse the current scenario. Respondents of the survey were women from varying age groups and different background. The method of sampling used was simple random. For research purpose descriptive method (cross-sectional) was implemented.*

**Keywords:** Menstrual Hygiene, Menses, Menstrual Cycle, Menarche,

### 1. INTRODUCTION

Menstruation is a milestone event in a woman's life and the beginning of her reproductive life. Lack of knowledge and poor sanitary practices during menstruation has been associated with serious ill-health ranging from genital tract infections, urinary tract infections and even death. Menstrual cycle is a characteristic procedure that happens month to month in young ladies and premenopausal grown-up ladies. During their lifetime, a lady will oversee menses on a normal of 3,000 days. The beginning of menstrual cycle is one of the most significant changes happening to a girl during her adolescence years. The main monthly cycle (menarche) happens somewhere in the range of 11 and 15 years with a mean of 13 years. Menstrual cycle is still viewed as something unclean in many social orders. The response to menstrual cycle relies on mindfulness and information about the topic. The way where a young girl finds out about menstrual cycle and its related changes may affect her reaction to the occasion of menarche. In spite of the fact that monthly cycle is a characteristic procedure, it is connected with a few confusions and practices.

Polluted water, poor sanitation and lack of cleanliness & accessibility to basic infrastructure like toilets results in numerous health issues. Without access to clean water, waste administration, or information on fundamental cleanliness, public health is severely compromised. The menstrual cycle can be difficult to oversee without access to clean products & surroundings. Furthermore, poor information can propagate unhygienic practices. Young women are frequently not educated about menstrual cycle before it happens, leaving them with sentiments of fear and vulnerability. Practices identified with menstrual cycle cleanliness are of significant worry as it has a sway on our well being. Whenever ignored, it prompts harmful genital disorder, reproductive tract infections (RTI), and other vaginal ailments. Poor genital cleanliness influences a young woman's health.

Menstrual hygiene is still a taboo subject in India, but the scenario is quickly changing. There are movies being made on this subject, many celebrities are talking about it and many organisations are trying to spread word about it. But these drives are still not enough. It's important for people to be well educated on the subject but it's difficult to provide people with information. In India, mostly in rural parts, majority women don't have access to sanitary pads which is the most basic requirement during menstruation. A few state governments have started providing sanitary pads in public washrooms, but the women have to pay for it, even though this is a basic item that a woman requires during menses. Many women have come forward rebelling and asking government to provide free sanitary pads and tampons in public restrooms just as they provide free toilet papers as both the products serve our sanitary requirements.

Not many people are aware about the sanitary products and the various inventions related to menses. We have tampons, menstrual cups, panty liners and reusable pads available, however many people are yet not aware about how to use these. The advantage of internet is that a few you tubers and bloggers are speaking about these products and how to use them.

## 2. OBJECTIVES

1. To analyse the concept of menstrual hygiene among women.
2. To understand issues related to menstrual hygiene among women.

## 3. LITERATURE REVIEW

An investigation was led by Dr. Pragya Sharma, Anamika Sharma, Devender K. Taneja and Renuka Saha (2008) detailed the most well-known impact of menstrual issues on every day schedule was as delayed resting hours (54%) trailed by powerlessness to ponder (half). The greater part (52%) of the subjects talked about their issues with their mom, and 60% of the investigation subjects were settled on allopathic treatment for their menstrual issues.

Ramchandra C. Goyal (2010). Closed Majority of the women got the data with respect to monthly cycle from their moms (41%), trailed by Media (24%) and companions (19%). Of the women who created genital tract contaminations, 66% utilized material. 37% women don't unveil about their menstrual cycle. In a few societies, numerous women are kept at home when they start bleeding, either for all time (drop-out) or incidentally (GAPS& FAWE Uganda, 1999) during the days that they bleed. Emily Oster and Rebecca Thornton (2010) says the case that women miss huge measures of school during their periods is to a great extent based, up till now, on tales and suspicions. Studies identified with monthly cycle and unthinkable Study was directed by Marrow, P. (2002) on menstrual taboos in Russian Orthodox Christians. Discharging ladies should live disconnected in a little cottage during this time this time.

As indicated by Bharadwaj and Patkar (2004), closed "Insignificant exertion has gone into the creation and social showcasing of ease napkins, reusable materials, examination into biodegradables, and so on. An article by Ananya Dutta in the paper 'The Hindu' (KOLKATA, March 18, 2010), expressed that the Gender Hygiene Program (GHP) propelled here three years prior is endeavouring to change this mentality towards menstrual cleanliness. The program, under route in five regions in West Bengal, includes self-improvement gatherings (SHG) fabricating reasonable sterile towels from cotton and tissue paper. The napkins are then sold by similar ladies to others in the town.

## 4. RESEARCH METHODOLOGY

To conduct the research, I have referred to primary as well as secondary data. I hv compiled primary data using questionnaire and polls (Instagram) from the respondents on simple random basis in the Mumbai region. Secondary data has been taken from various reports and online websites who have conducted surveys on menstrual hygiene.

### 4.1 Data analysis

Question	YES	Percentage	NO	Percentage	Total Responses collected
1. I am aware about what exactly is menstrual cycle	189	97.42%	5	2.58%	194
2. I have access to sanitary products	168	94.91%	9	5.08%	177
3. I was educated about the menstruation in school	149	80.10%	37	19.89%	186
4. I was provided with basic hygiene equipment and information when I got my first period	147	88.55%	19	11.44%	166
5. I learnt about periods in detail when I was in college	83	52.20%	76	47.80%	159
6. I am aware that ignored menstrual hygiene can spread disease	152	88.88%	19	11.11%	171

In order to understand the state of awareness among women around us, I hv used Instagram Polls. The respondents were given two options for each question. (Yes/No).

From the above data we can draw following conclusion:

Maximum number of women (approx. 95%) in urban area was aware about menstrual cycle and had access to sanitary products. Approx. 80-85% women were educated about menstruation and they were equipped with information and products required for hygiene at the menarche. There were around 52% women who learnt about menstrual cycle when they were in college. And nearly 89% women were aware that poor hygiene practices can lead to diseases and affect their well being.

## 4.2 HYPOTHESIS

- a) Ho:** There is not a very high level of awareness among urban women about menstrual hygiene.
- b) H1:** There is a high level of awareness among urban women about menstrual hygiene.

## 4.3 ANALYSIS

The polls (conducted on Instagram) had a total of 200 responses and helped me review real time responses of the followers of the page used to supervise the poll. Based on the survey, we can gauge that most girls in Mumbai region started their menses with sound knowledge regarding the cycle (84% of the total sample). 17.9% of the total sample experienced menarche when they were less than 12 years old, 63.4% experienced it between the ages of 12-14 years and 18.7% women experienced it after 14 years of age. The knowledge regarding menses was provided to them in school (76.4%) and further details were acquired by them in college (62.6%). Most young women (84%) at menarche had access to sanitary products and hygiene related items. Right now, a large chunk of women (89.3%) in Mumbai have access to sanitary pads during their menstrual cycle. Women in the city have a track of their menstrual cycle as most of them were able to analyse whether their cycle was regular (77.9%) or irregular (22.1%). 87.9% of women are aware that ignored menstrual hygiene can lead to diseases. While 8.9% of women were sceptical and chose "maybe" as an option, the remaining 3.2% women weren't aware that they can contact diseases due to unhygienic menstrual practice.

## 4.4 CONCLUSION

It is found from the study that most women in Mumbai region have sound knowledge and information about menstruation and menarche. Women have been taught in schools as well as their home as to what menses is and how it affects their physical well being. Through the various data collection modes used in this research I came to know the current situation of women in Mumbai and how they felt when they encountered menarche. As opposed to yesteryears, acceptance regarding this subject has increased substantially which has led to the increased awareness regarding the various diseases that can be contacted if proper hygiene is not maintained during menstrual cycle. Women are aware about different types of menstrual products that can be used in order to maintain menstrual hygiene. Due to technological advancements many innovative menstrual products are available in the market. Student organizations lie ENACTUS have started movements like 'Inaayat' through which reusable sanitary pads are distributed amongst rural women at concessional rates.

**Hence the null hypothesis is rejected.**

## 5. IMPLICATIONS & SUGGESTIONS

Menstruation which is also referred to as periods, called so because they're periodic. Every month for 5-7 days women go through this cycle, which releases the unfertilized egg from their ovaries. This causes a lot of discomfort, pain and hormonal changes in females. Due to the shedding of the uterine wall, at times they experience a lot of abdominal pain and have terrible cramps. Females use certain products like sanitary pads, tampons, menstrual cups etc. for the same. But not every female in our country or in the world are equally privileged. Basic education on menstruation is not provided to every woman, which causes certain complications in the future. Women from the rural areas and under developed areas do not have access to these products. Due to lack of resources, these women have a very unhealthy lifestyle and hence face difficulties and are the victims of several fatal diseases. Government should arrange an educational meeting in such places where access to the internet isn't possible or the society is illiterate. Since women do not voluntarily go through this cyclic change, government should provide free services in areas where resources aren't available. Girls in their early puberty should be educated about the upcoming hormonal changes in her. It shouldn't come off as a huge shock to her when she reaches puberty. Through my research, I want to help such women of the society in the coming future. I want my research to be useful to all the sections of the society. Through my research I not only want to help all the women of our society but also break the taboo. Menses are considered to be impure in so many religions, women aren't treated properly. To get over such orthodox rituals we need to educate our society as a whole. In our male dominant society, we tend to forget that females play such a huge role in our lives. To keep them healthy and to provide them the best of all the resources, the government should do the

needful. In the near future we would want all the women to have a healthy lifestyle and to deal with these days with a little less hassle. We cannot take away the pain but we can provide the products and environment which will make them feel better. I hope this research has been a success and that it will help one and all, in the coming future.

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## Automated Patient Monitoring and Support System Architecture

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### ABSTRACT

*In today's busy world health care is a major concern. Especially when it comes to healthcare of someone elderly or someone with chronic illness. A constant monitoring of the patient is needed. Lack of time due to increase in working hours and lack of availability of nursing staff draws a major concern in this sector as per report given by economic times. There are phases when patients are advised restrictions on food, movement, etc, monitoring such patients when home alone is always a challenge. To address this challenge, in this paper the researcher proposes architecture based on object detection module that will detect the violations of medical restrictions and sends push notification on the smart phone to the user. This technology will help the relative to be carefree and also aid in recovery of the patient.*

*Keywords: Object detection, patient monitoring, deep learning, healthcare technology, mobile app*

### I. INTRODUCTION

Healthcare is a major market that arose as a concept in the last quarter of twentieth century. Today, monitoring of dependent people in busy life is a real challenge. This is mainly due to the increase in the number of elderly and various diseases such as cancer, diabetes, etc. There is also a significant reduction of medical staff to support patient health care. The global population of people over the age of 65 is expected to reach 761 million by 2025, proposing another concern for continuous monitoring<sup>1</sup>. The rise in inflation has also raised the cost of caring and monitoring. For those elderly and patients who are home alone demand constant observation. For example a diabetic is advised not to eat sweet, but due to the craving many people indulge in eating sweets when left unobserved, that increases the illness. If an individual is advised rest and non-movement of leg or hands due to an injury or fracture, the patients tends not to follow the instruction when they are left unmonitored. Patients suffering from diseases like dementia, Alzheimer's also need monitoring. The manned monitoring is often costly and difficult. In today's Artificial intelligence and machine learning age there have been many technological innovation and development that have made many impossible and tedious tasks easy. Health care sector also has not remained untouched. In this paper the researcher proposes an architecture that uses the object detection module along with live stream management APIs that can detect a prohibition and alert the user. This system will make the relatives carefree and help them monitor the patient.

### II. SCOPE

This technology has a large scope to dominate the health and home care market. The technology has minimum requirement of a CCTV and an user friendly App. The users can depend on this technology to monitor and take care of the patient. This technology is highly scalable and customizable as compared to any other monitoring system. The model training can be customized as per the patient health routine, increasing the scalability and scope.

### III. THE PROPOSED TECHNOLOGY ARCHITECTURE

The technology needs two hardware- one CCTV camera installed to keep a check on the patient and the second one -a smartphone where the proposed app is installed. This technology is packaged in an App that is compatible with android, IOS and is deployed in the cloud that hosts a machine learning model along with APACHE API. It has two modules-(i)**push notification reminders**-giving reminders for medication timings, health checkup follow-ups, buying of medication, notifying the doctor to visit, etc. , (ii) **object detection module**- it works on continuous object detection that alerts the user if the patient is in pain, or is performing actions or activities that are medically prohibited.

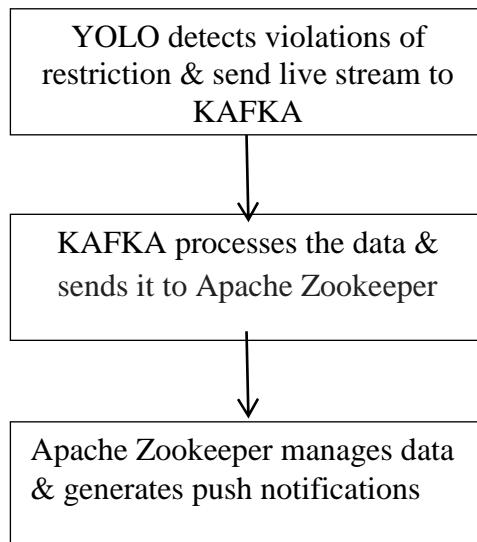
<sup>1</sup> Proceedings of the First International Conference on the Digital Society Year of Publication: 2007 , ISBN:0-7695-2760-4

## TRAINING DATA

To train the model firstly 10 patients' medical data such as medical routine, food restriction, movement restrictions etc. are fed into app manually. The patients are then exposed to the object detection module to train the model for a period of 2 hours. We will consider 10 frames in each hour for training our model. The model will use 70% of the collected data for learning and 30% for testing.

## OBJECT DETECTION MODULE

The technology is proposed to be developed in Tensorflow Lite 3.0 library. The object detection module is proposed using YOLO (You Look Only Once) API. YOLO is known to have an efficient object detection module. Along with strong object detection module it also proved to be efficient in real-time Object detection in live stream. The observed data will be classified into 2 classes namely food restrictions and movement restrictions. YOLO would continuously be observing the patient and the live stream would be processed in Apache Kafka which is open-source stream-processing software within Apache. Kafka then sends the data to Apache Zookeeper for data management and generating push notifications. Since the camera is observing the patient constantly in real time, with this technology the patient's relative will be notified if the patient is not following any medical restriction



## The medical history database & notifications

The patients have various important medical data such as, medicines data, follow ups data, pathological diagnosis data, diet routine data, etc. which are stored in cloud. The proposed technology alerts the user about medicine timings, diet routines, routine exercises, medical follow ups etc. The App will raise a notification as a reminder to the user to check if the patient has had the medicines or followed a routine or not using a push notification API.

## IV. API USED

### YOLO

YOLO (you look only once) is a clever object detection convolutional neural network (CNN) that detects the objects real time with high accuracy<sup>1</sup>. The algorithm applies a single neural network on an image or a live stream, and then divides the image or the stream into regions of 3x3 grid. YOLO then predicts bounding boxes and probabilities for each region. The bounding boxes are weighted according to their predicted probabilities. The algorithm "only looks once" at the image in the sense that it requires single forward propagation pass through the neural network to make predictions. YOLO then outputs recognized objects together with the bounding boxes. With YOLO, a single CNN simultaneously predicts multiple bounding boxes by using the anchor box feature. YOLO is extremely fast and easy to train. Since YOLO sees the entire image during training and testing, it encodes contextual information about the object's classes and appearance. YOLO learns generic representations of objects in training and testing, hence the algorithm outperforms other top detection methods.

<sup>1</sup> YOLOv3: An Incremental Improvement Joseph Redmon, Ali Farhadi University of Washington

## Apache Kafka

Apache Kafka is an open-source stream-processing platform that provides a unified, low-latency platform for handling real-time data feeds<sup>1</sup>. Kafka uses a binary TCP-based protocol that depends on a "message set" abstraction that naturally groups messages together reducing network congestion. This API is based on the commit log, and it allows users give data inputs to any number of systems or real-time applications<sup>2</sup>. Kafka Stores streams of records in a fault-tolerant durable way and Processes streams of records as they occur. Kafka will manage the real time stream and the object detection data from YOLO to process further in the Zookeeper.

## Apache zookeeper

ZooKeeper is Apache's centralized service that maintains configuration information, naming, and provides distributed synchronization, group services, largely recommended for managing data and generating notifications. ZooKeeper's architecture supports high availability through redundant services. The data is stored in hierachal namespace in ZooKeeper nodes. Users can read from and write to the nodes and in this way have a shared configuration service<sup>3</sup>. ZooKeeper was initially designed to store coordination data: status information, configuration, location information, etc. The meta-information is usually stored in much smaller pieces of data making the processing highly efficient. The user maintains a TCP connection through a single server to sends requests, gets responses, etc. If a TCP connection to the server breaks, the user will connect to a different server. When a user first connects to the ZooKeeper service, the first ZooKeeper server will setup a session for the user. If the user needs to connect to another server, this session will get reestablished with the new server. This makes the zookeeper a real time notification generating option.

## V. CONCLUSION

The exponential growth of elderly and diseased has increased the concern to provide a constant remote monitoring, the busy life style has made this a challenge. There may be possibility for important medical restriction to be followed, but due to numerous reasons patients tend to avoid. In this technology we use the object detection module that is fast paced and accurate to detect any violations of medical advice. Using the top end APIs such as Apache Kafka we propose to manage the live stream data in accordance with YOLO object detection module. The live stream data would then be matched with the medical data to detect any violations and notify the user if a violation is detected. This alert will then make the user contact someone to raise an alarm and stop the patient from violating medical advice. The technology if reaches in experimentation stage will benefit the masses largely.

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## A study on effect of cotton price fluctuations on the profitability of Textile industry with special reference to Century Textiles & Industries Ltd

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### **ABSTRACT**

*This paper focuses on the impact of fluctuations in the price of cotton as a raw material on the textile industry with special reference to Century Textiles & Industries Ltd. Even though there is an increase in the revenue of the company, the total cost has been increasing simultaneously. The textile industries are facing a problem of declining profits. Cotton being the raw material of these textile industries is a seasonal product. Production of cotton is highly fluctuating due to high seasonal fluctuations.*

### **1. INTRODUCTION**

The Indian textile industry is one of the oldest industries having evolved from a domestic small-scale industry to one of the largest industries in the world with an extensive manufacturing base. It is one of the most important sectors of the Indian economy in terms of output, foreign exchange earnings and employment. Maharashtra ranks second in the production of cotton in India. It is the important cash crop in the state. Nearly three million farmers are mostly busy in the cultivation of cotton in backward Marathwada and Vidarbha region. Maharashtra state accounts 20% of the country's total cotton production and 30% of the country's total area under cotton cultivation.

Century Textiles and Industries Limited is into the business of textiles, rayon, cement, and pulp and paper. The segments of the company include Textiles, which includes yarn, cloth and denim cloth, viscose filament yarn and tire yarn; Pulp and Paper, which includes pulp, writing and printing paper, tissue paper and multilayer packaging board; Cement, which includes cement and clinker; Real Estate, which includes leased properties, and Others, which includes salt works, chemicals and floriculture.

Century Textiles and Industries Limited (CTIL), was incorporated in Mumbai, India, in the year 1897. Birla Century which is an important division of CTIL was set up at Jhagadia, Bharuch, Gujarat, with an investment of about US\$ 180 million (Rs. 850 Crore) in the year 2009.

The company is spread over an area of 43.56 million Sq.Ft. (100 Acres). It uses the best modern machinery to produce a variety of premium textiles — from Bottom weights & Suitings to Finer fabrics, household linen etc. Innovative products of the company includes wrinkle-free, easy care, anti-bacterial etc, which are imparted to fabrics through world-class automated processing with eco-friendly and non-toxic dyes and chemicals.

The plant has world-class mechanical and chemical laboratories to test fabrics as per international norms and equipped with a pilot sampling facility for quick development of samples. Its Research & Development center has a Design Studio for continuous innovations in designs and weaves in tune with the latest international trends.

Birla Century's USP is the customization they offer to their clients in terms of the weave, design and texture of products. They have an extensive network of distributors and dealers in India and also sell the exclusive range of home-textiles and other products in the global market.

### **2. RESEARCH PROBLEM**

This paper focuses on the problem of fluctuations in cotton price and its effect on the profitability of the textile industries with special reference to Century Textiles and Industries Ltd. The fluctuations in cotton price will vary the yarn price in turn the textile industries are facing the hard competition in the Domestic as well as International market. So, these price fluctuations will adversely affect their profitability margin.

### **3. OBJECTIVES**

1. To study the financial performance of Century Textiles & Industries Ltd

2. To study the relationship between Profitability and sales.
3. To analyze the influence of price fluctuations in the Profitability of Century Textiles & Industries Ltd

## 4. RESEARCH METHODOLOGY

### 4.1. PERIOD OF THE STUDY

Period of study is five years from 2014-2015 to 2018-2019

### 4.2. SOURCE OF DATA

Secondary Data is used for the study

Secondary data is collected from Annual Reports of company through its Website, Newspapers and Journals

### 4.3. DATA ANALYSIS AND INTEPRETATION

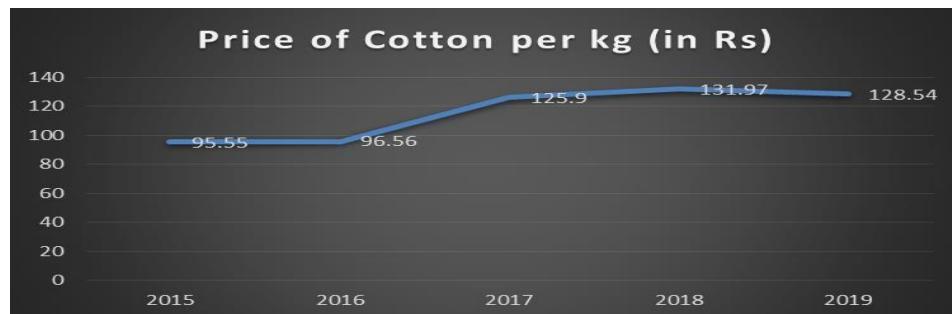
Data analysis and interpretation is the process of assigning meaning to the collected information and determining the conclusions, significance, and implications of the findings.

Ratio analysis is an important tool for examining the health of a company by studying the relationships of key financial variables.

The cost of raw cotton is the single largest cost factor for the manufacturing in spinning and composite mills. This industry is facing the problem of getting supply of raw cotton at reasonable prices and in superior quality. The high prices of raw cotton turn into rising cost of production.

**Table 1: Increasing price of cotton per kilogram for the past five years**

Year	Price of Cotton per kg (in Rs)
2015	95.55
2016	96.56
2017	125.9
2018	131.97
2019	128.54



From the above table and graph it can be inferred that there has been a rising trend in the price of cotton per kilogram from 2015 to 2019

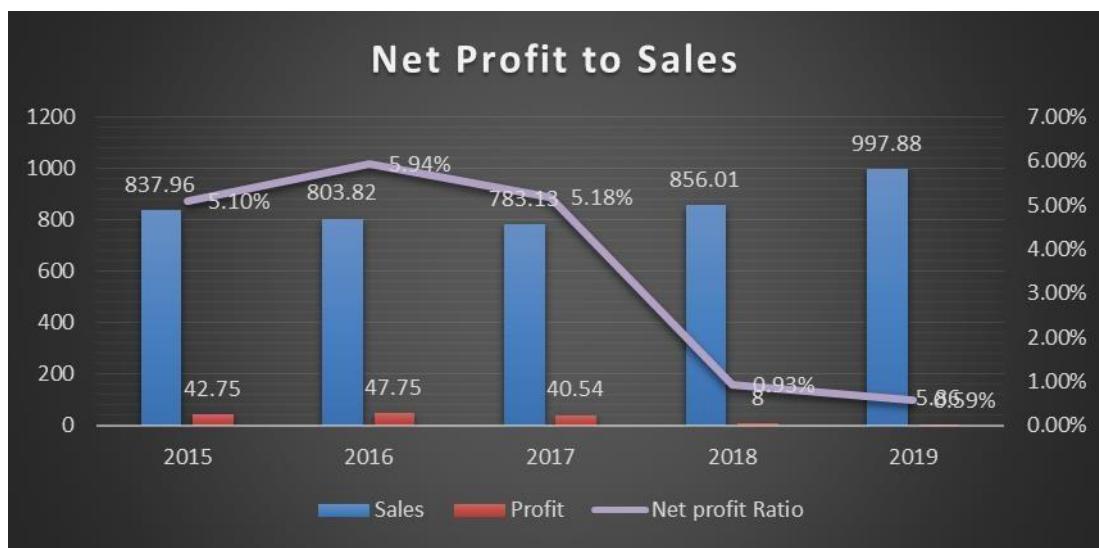
**Table 2: Sales and Net Profit for the Past five years**

Net profit ratio=Net profit/Net sales\*100, this ratio measures the overall profitability of the firm.

The ideal net profit ratio is 5% to 10%.

(Rs. In crores)

Year	Sales	Profit	Net profit
2015	837.96	42.75	5.10%
2016	803.82	47.75	5.94%
2017	783.13	40.54	5.18%
2018	856.01	8	0.93%
2019	997.88	5.86	0.59%



**Inference:** From the above table and graph it is clear that company shows a fluctuating but increasing trend in sales, but the company's net profit margin shows a decreasing trend. Increasing trend in sales is not influencing the profitability of the company proportionately.

**Table 3: Sales and Total cost for the five years**

The cost-to-sales ratio measures operation efficiency by comparing operating costs as a proportion of the total revenue.

Cost to sales ratio = (total cost / sales) \*100

**(Rs. In crores)**

Year	Sales	Total Cost	Cost to Sales
2015	837.96	795.21	94.90%
2016	803.82	740.9	92.17%
2017	783.13	735.03	93.86%
2018	856.01	847.57	99.01%
2019	997.88	992.4	99.45%



**Inference:** Sales are increasing every year, simultaneously cost is also increasing year by year, so company couldn't attain any high profit margin even though the company shows an increasing trend in sales. In the year 2018 company shows high cost and in the year 2019 company shows highest cost while compared to previous years.

**Table 4: material cost and other cost to Total cost**

**Total cost = Material cost + other cost**

Material cost to total cost is to find out the proportion of material cost in total cost

Material cost to total cost = (material cost/Total cost) \*100

Other cost to total cost ratio is to find out the proportion of cost other than material from total cost

Other cost to total cost = (other cost/ total cost) \*100

**(Rs. In crores)**

Year	Total Cost	Material cost	Material Cost to Total Cost Ratio	Other Cost	Other Cost to Total Cost Ratio
2015	795.21	445.32	56.00%	349.89	44.00%
2016	740.9	432.06	58.32%	308.84	41.68%
2017	735.03	433.67	59.00%	301.36	41.00%
2018	847.57	522.10	61.60%	325.47	38.40%
2019	992.4	595.44	60.00%	396.96	40.00%



**Inference:** The major element of Total cost is material cost, so any fluctuations in material cost will affect the total cost and ultimately the profit margin. Trend line of total cost is similar to that of material cost. With the increase in material cost, there is a corresponding increase in the total cost. Other cost has also increased but in less proportion as compared to material cost and total cost.

## 5. FINDINGS

- From the above data, it is clear that there is an increasing trend in sales of the company, but its net profit margin is fluctuating showing a decreasing trend.
- In the year 2018 and 2019 the company's profits have fallen drastically from 5.18% in 2017 to 0.93% in 2018 and finally to 0.59% in 2019.
- Increasing trend in sales is not influencing the profitability of the company.
- In the year 2019 the company has witnessed the least profit as compared to the previous five years.
- Even though the company shows an increasing sales trend, Company was unable to maintain an increasing trend in its profit margin.
- Sales are increasing year by year correspondingly cost is also increasing year by year, so company cannot attain any high profit margin even though the company shows an increasing trend in sales.
- In the year 2019 company shows highest cost corresponding to the increased material cost which is due to the increase in the price of cotton in the domestic markets.
- Major element in the Total cost is material cost, so any changes in the price of material will affect the total cost and profit margin. Trend line of total cost is similar to that of material cost.

## 6. CONCLUSION

- In a today's competitive global market conditions, doing business is a big challenge. And these challenges can be met by taking informed decision. On analyzing the overall scenario of Century Textiles & Industries Ltd in India, it can be said that the price of raw materials is key factor affecting the total cost of the product.
- So, any changes in the price of raw material will affect the profitability of the product.
- As the textile industries are facing the hard competition in Domestic as well as International market it is advisable to have a separate data warehouse and data mining department for updating the information with regards to the latest trends in the economy and market.
- Cotton textile Industry is one of the privileged industries of Indian economy, so the companies under such industry should be protected and guided.

## 7. SUGGESTIONS

- The company should take necessary measures to withstand the uncertain contingencies in the global economy.
- There should be an increase in the level of awareness on the part of company about domestic and international market cotton pricing policies.
- Effective techniques should be adopted to control and minimize the production cost.
- Cost of Material should be minimized by adopting proper procedure techniques.

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## Detection of Diabetes Mellitus Using Fuzzy Inference System

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### ABSTRACT

*Diabetes Mellitus is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood sugar. Raised blood sugar, is a common effect of uncontrolled diabetes mellitus and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. Number of Diabetes Mellitus patients has been rising more rapidly in middle- and low-income countries. In this paper the author has tried to detect Diabetes Mellitus using Mamdani method of Fuzzy Inference System (FIS)*

**Keywords:** Diabetes Mellitus, insulin, hormone, crisp, fuzzy, FIS.

### 4. INTRODUCTION

**Diabetes Mellitus:** Diabetes Mellitus is getting common day by day and is having a fast-increasing trend. Many researches have been made on detection of diabetes. Diabetes can be classified into Type 1 diabetes, Type 2 diabetes, Gestational diabetes mellitus (GDM) and Specific types of diabetes. . Diabetes is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation [1]. Diagnosis of diabetes Mellitus at early stage is very important to cure it quickly.

Increased thirst and urination, increased hunger, fatigue, blurred vision, numbness or tingling in the feet or hands, sores that do not heal, unexplained weight loss are the major symptoms of diabetes.

When the feasibility of a problem is not resolved or is difficult with the crisp value, a fuzzy-based problem-solving approach is used.

Various Clinical Decision Support Systems have been constructed by the aid of Fuzzy Logic. These systems are now widely used in hospitals and clinics. They are proved to be very useful for patient as well as for medical experts in making the decisions. In this process doctors rely on gained knowledge and experience. However, it seems necessary for them to have the ability to think logically, to use reasoning, to infer, to precisely and clearly express their thoughts and justify the assertions made. This paper will present the importance of logic in the medical field.[3]

**Fuzzy Inference System:** It is well known as fuzzy expert system, fuzzy model or fuzzy rule-based system. FIS is basically a decision-making system that uses fuzzy logic or IF-THEN rule for generating results. FIS is used mainly for uncertain and approximate reasoning. The architecture of FIS model is given in Figure 1.

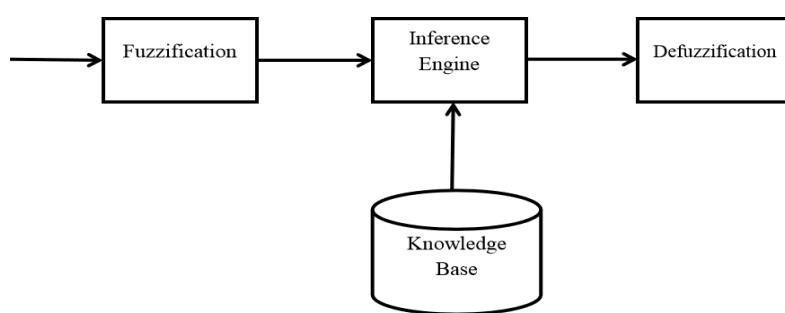


Figure 1 – Fuzzy Inference System Model [1]

Fuzzification Unit converts the crisp value into fuzzy value and provides it to inference engine for decision making. Inference Engine extracts the appropriate data from knowledge base as required by fuzzy input value, performs the decision making operation s and generates fuzzy output value. Diffuzification Unit converts the fuzzy output set into the crisp set as a result. [4]

## 1.1. OBJECTIVES OF STUDY

This study aims to detect the diabetes mellitus using Mamdani method of Fuzzy Inference System. It just detects that whether diabetes mellitus is present or not. It doesn't classify that which type of diabetes. For detection total five parameters are used as Pregnancies, Glucose, BloodPressure, BMI and DiabetesPedigreeFunction.

## 5. MATERIAL AND METHOD

The researcher has adopted descriptive methodology. For this report, reliance has been placed on books, journals, newspapers and online database. This paper is based on secondary data for which references are collected from various sources.

These data for the five parameters mentioned in objective of study is taken from Pima Indians diabetes database.

Implementation of expert system for diagnosis of diabetes mellitus disease was conducted by inputting primary data from the results of examination of physicians at Puskesmas Kramat Jati and Puskesmas Pasar Rebo, then determine the accuracy value of the expert system produced. Here in this paper the expert system data is the secondary data. Total 200 data are taken as input and processed using Mamdani's Fuzzy Inference System (FIS) approach with the help of Matlab toolbox.[1]

### Detecting Diabetes Mellitus Using Mamdani method of FIS

**Input dataset taken:[6]**

Pregnancies	Glucose	BloodPressure	BMI	DiabetesPedigreeFunction
Number of times pregnant	Plasma glucose concentration a 2 hours in an oral glucose tolerance test	Diastolic blood pressure (mm Hg)	Body mass index (weight in kg/(height in m) <sup>2</sup> )	Diabetes pedigree function
6	148	72	33.6	0.627
1	85	66	26.6	.351

Table 1: Data used for calculation [6]

Variables and category values are taken as secondary data [2]

No	Variable	Value	Classification	Domain
1	Plasma Glucose Concentration a 2 hour	187 - 232	Unnormal	[6 10]
		141 - 186	Medium	[3 7]
		44 - 140	Normal	[0 4]
2	Diastolic Blood Pressure (mm Hg)	92 - 122	Unnormal	[6 10]
		81 - 91	Medium	[3 7]
		30 - 80	Normal	[0 4]
3	Body Mass Index	34 - 67	Unnormal	[6 10]
		26 - 33	Medium	[3 7]
		18 - 25	Normal	[0 4]
4	Diabetes Pedigree Function	0.528 - 2.288	Unnormal	[6 10]
		0.500 - 0.527	Medium	[3 7]
		0.084 - 0.499	Normal	[0 4]
5	Pregnant	10 - 17	Unnormal	[6 10]
		5 - 9	Medium	[3 7]
		0 - 4	Normal	[0 4]

Table 2- Variables and category values

The research steps are the development of Fuzzy Inference System (FIS) Mamdani consists of:

1. Identify the input and output variables and decide descriptor (linguistic variables) for the same which is known as fuzzification
2. Define membership functions for each input and output variables
3. Form a rule base to map each input to the output to be achieved
4. Rule evaluation to test the output of the resulting application
5. Defuzzification to recover the crisp value from the number of rules that have been made

## Step 1: Identify input and output variables:

Input variable: Pregnancies, Glucose, BloodPressure, BMI and DiabetesPedigreeFunction.

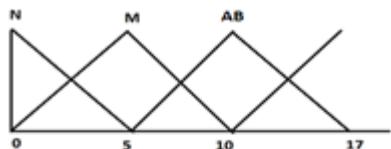
Output variable: outcome.

Descriptor (linguistic variables): Abnormal (AB), Medium (M), Normal (N).

## Step 2: Define membership functions for each input and output variables

All diagram details are taken from Table 2

(i) Pregnancies:



$$\mu_N(x_1) = \frac{5 - x_1}{5}, \quad 0 \leq x_1 < 5$$

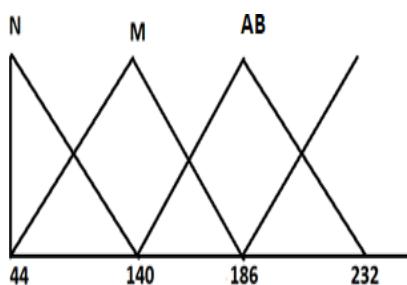
$$\mu_M(x_1) = \frac{10 - x_1}{5}, \quad 5 \leq x_1 < 10$$

$$\mu_M(x_1) = \frac{x_1}{5}, \quad 0 \leq x_1 < 5$$

$$\mu_{AB}(x_1) = \frac{17 - x_1}{7}, \quad 10 \leq x_1 \leq 17$$

$$\mu_{AB}(x_1) = \frac{x_1 - 5}{5}, \quad 5 \leq x_1 < 10$$

(ii) Glucose



$$\mu_N(x_2) = \frac{140 - x_2}{96}, \quad 44 \leq x_2 \leq 140$$

$$\mu_M(x_2) = \frac{186 - x_2}{96}, \quad 140 \leq x_2 < 186$$

$$\mu_M(x_2) = \frac{x_2 - 44}{96}, \quad 140 \leq x_2 \leq 186$$

$$\mu_{AB}(x_2) = \frac{232 - x_2}{46}, \quad 186 < x_2 \leq 232$$

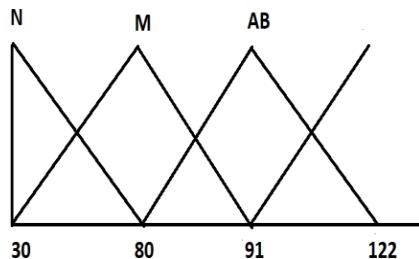
$$\mu_{AB}(x_2) = \frac{x_2 - 140}{46}, \quad 140 < x_2 \leq 186$$

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(iii) BloodPressure



$$\mu_N(x_3) = \frac{80 - x_3}{50}, \quad 30 \leq x_3 \leq 80$$

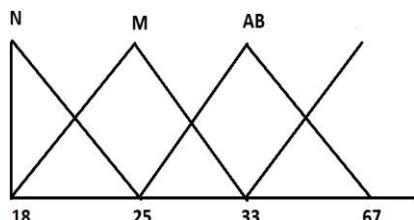
$$\mu_M(x_3) = \frac{91 - x_3}{11}, \quad 80 < x_3 \leq 91$$

$$\mu_M(x_3) = \frac{x_3 - 30}{50}, \quad 30 \leq x_3 \leq 80$$

$$\mu_{AB}(x_3) = \frac{122 - x_3}{31}, \quad 91 < x_3 \leq 122$$

$$\mu_{AB}(x_3) = \frac{x_3 - 80}{11}, \quad 80 < x_3 \leq 91$$

(iv) BMI



$$\mu_N(x_4) = \frac{25 - x_4}{7}, \quad 18 \leq x_4 \leq 25$$

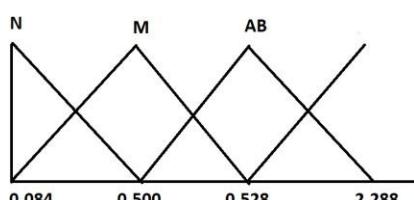
$$\mu_M(x_4) = \frac{33 - x_4}{8}, \quad 26 < x_4 \leq 33$$

$$\mu_M(x_4) = \frac{x_4 - 18}{7}, \quad 18 \leq x_4 \leq 25$$

$$\mu_{AB}(x_4) = \frac{67 - x_4}{34}, \quad 33 < x_4 \leq 67$$

$$\mu_{AB}(x_4) = \frac{x_4 - 25}{8}, \quad 25 < x_4 \leq 33$$

(v) DiabetesPedigreeFunction



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$$\mu_N(x_5) = \frac{0.500 - x_5}{.416}, \quad 0.084 \leq x_5 \leq 0.500$$

$$\mu_M(x_5) = \frac{0.528 - x_5}{0.028}, \quad 0.500 \leq x_5 < 0.528$$

$$\mu_M(x_5) = \frac{x_5 - 0.084}{0.416}, \quad 0.84 \leq x_5 < 0.500$$

$$\mu_{AB}(x_5) = \frac{2.288 - x_5}{1.760}, \quad 0.528 < x_5 \leq 2.288$$

$$\mu_{AB}(x_5) = \frac{x_5 - 0.500}{0.028}, \quad 0.500 < x_5 \leq 0.528$$

**Step 3. Form a rule base to map each input to the output to be achieved**

$$\mu_M(x_1) = \frac{10 - 6}{5} = \frac{4}{5}$$

$$\mu_M(x_2) = \frac{186 - 148}{46} = \frac{19}{23}$$

$$\mu_{AB}(x_2) = \frac{148 - 140}{46} = \frac{4}{23}$$

$$\mu_N(x_3) = \frac{80 - 72}{50} = \frac{4}{25}$$

$$\mu_M(x_3) = \frac{72 - 30}{50} = \frac{21}{25}$$

$$\mu_{AB}(x_4) = \frac{67 - 34}{34} = \frac{33}{34}$$

$$\mu_{AB}(x_5) = \frac{2.288 - .627}{1.760} = \frac{1.661}{1.760}$$

Pregnancies	Glucose	BloodPressure	BMI	DiabetesPedigreeFunction
M	M	N	AB	AB
	AB	M		

## Rules

- i. M M N AB AB
- ii. M AB N AB AB
- iii. M M M AB AB
- iv. M AB M AB AB

**Step 4: Rule evaluation to test the output of the resulting application**

Find the strength of Rules:

$$S_1 = \min \left( \frac{19}{23}, \frac{4}{25}, \frac{33}{34}, \frac{1.661}{1.760} \right) = \min (.8, .83, .16, .97, .94) = .16$$

$$S_2 = \min \left( \frac{4}{23}, \frac{4}{25}, \frac{33}{34}, \frac{1.661}{1.760} \right) = \min (.8, .17, .16, .97, .94) = .16$$

$$S_3 = \min \left( \frac{4}{5}, \frac{19}{23}, \frac{21}{25}, \frac{33}{34}, \frac{1.661}{1.760} \right) = \min (.8, .83, .84, .97, .94) = .8$$

$$S_4 = \min \left( \frac{4}{5}, \frac{4}{23}, \frac{21}{25}, \frac{33}{34}, \frac{1.661}{1.760} \right) = \min (.8, .17, .84, .97, .94) = .17$$

### Step 5: Defuzzification to recover the crisp value from the number of rules that have been made

As per the highest method defuzzification, it is max membership to be considered. Hence

$$\text{Max } (s_1, s_2, s_3, s_4) = \max (.16, .16, .8, .17) = .8$$

And  $.8 > .5$  hence, diabetes is present, which is matching with the conclusion given by the dataset.

### Another example for the second record of the table 2.

#### Step 3. Form a rule base to map each input to the output to be achieved

$$\mu_N(x_1) = \frac{5 - 1}{5} = \frac{4}{5}$$

$$\mu_M(x_1) = \frac{1}{5}$$

$$\mu_N(x_2) = \frac{140 - 85}{96} = \frac{55}{96}$$

$$\mu_M(x_2) = \frac{85 - 44}{96} = \frac{41}{96}$$

$$\mu_N(x_3) = \frac{80 - 66}{50} = \frac{7}{25}$$

$$\mu_M(x_3) = \frac{66 - 30}{50} = \frac{18}{25}$$

$$\mu_{AB}(x_4) = \frac{33 - 26.6}{8} = \frac{6.4}{8}$$

$$\mu_{AB}(x_4) = \frac{26.6 - 25}{8} = \frac{1.6}{8}$$

$$\mu_N(x_5) = \frac{0.5 - .351}{.416} = \frac{.149}{.416}$$

Pregnancies	Glucose	BloodPressure	BMI	DiabetesPedigreeFunction
N	N	N	M	N
M	M	M	AB	

### Rules

- i. N N N M N
- ii. N N N AB N
- iii. N N M M N
- iv. N N M AB N
- v. N M N M N
- vi. N M N AB N
- vii. N M M M N
- viii. N M M AB N

- ix. M N N M N
- x. M N N AB N
- xi. M N M M N
- xii. M N M AB N
- xiii. M M N M N
- xiv. M M N AB N
- xv. M M M M N
- xvi. M M M AB N

#### **Step 4: Rule evaluation to test the output of the resulting application**

Find the strength of Rules:

$$S_1 = \min (.8, .57, .28, .8, .36) = .28$$

$$S_2 = \min (.8, .57, .28, .2, .36) = .2$$

Likewise, the author has done for all ... so its values varies from minimum of .2 to .36.

#### **Step 5: Defuzzification to recover the crisp value from the number of rules that have been made**

As per the highest method defuzzification, it is max membership to be considered. Hence

$$\text{Max } (s_1, s_2, \dots, s_{16}) = \max (.28, .2, \dots, .36) = .36$$

And  $.36 < .5$  hence, diabetes is not present, which is matching with the conclusion given by the dataset.

#### **CONCLUSION**

In this paper author has used only first two records of datasets to show the entire working of Mamdani method and achieved the same output as given in the dataset. Hence, concluded that Mamdani method suits for detection of diabetes perfectly. In future, instead of using just five parameters, more parameters can be included like age, insulin and skin thickness for more perfection.

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## Social and Emotional Health survey among Voluntary and Involuntary Singlehood women in select suburbs of Mumbai city Mumbai

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### ABSTRACT

*The present study tries to evaluate whether there is any discrepancy among Voluntary and Involuntary Singlehood women on their social and emotional health phenomena. A total number of 150 single women from select Mumbai suburbs (Vikroli, Ghatkopar, Chembur and Matunga) have been selected through purposive sampling having different socio-economic background. The respondents included 150 women singles from two category Voluntary and Involuntary singlehood. A majority of single women were of emotional and social competence and have strong positive association on mental health. The main findings were that voluntarily single young adults reported a lower level of inferior compared to involuntarily single young adults. The two groups differed neither in regard to positive mental health nor in regard to mental health problems. In social exploitation is more among involuntarily compared to voluntarily.*

**Keywords** Social Emotional Health Survey, Voluntary and Involuntary, Singlehood women, Social and emotional health

### INTRODUCTION

Women who are alone despite living spouses are even more discriminated against in a patriarchal society. ‘They are described as women “even more despised... in a twilight zone of neither being respectably married nor widowed—especially, those who have themselves left their partners”.

According to the 2001 census, 7.4 per cent of the female population of India is ‘single’. There were 3,43,89,729 widows in India, and 23,42,930 divorced/separated women—a total of 3,67,32,659 single women. ‘This figure is likely to increase with the inclusion of “customarily” separated women and women whose husbands are missing.’ There was a 39% increase in the number of single women in India, the numbers rising from 51.2 million in 2001 to 71.4 million in 2011, according to census data. This includes widows, divorcees and unmarried women, and those deserted by husbands. “The reasons for the increase in population of single women are divorce, separation as well as widowhood,” said Nirmal Chandel, president of the National Forum of Single Women’s Rights, an advocacy. According to Jain (1975), “the roles and status of women have been far from static, ranging from what is thought to have been a position of considerable authority and freedom, to one of equally considerable subservience”.

An individual who remains single and never marries feels out of place, socially and culturally. According to Blumberg and Dwarki (1980), women cannot be happy without marriage mainly because of three reasons—problem of protection and living arrangement, biological and companionship needs, and social pressures and criticism. While it appears that social pressures on single women are lessening, traditional living arrangements and needs for protection and companionship still present practical difficulties.

Indian society is experiencing widespread and dramatic change in traditional gender and familial roles. Employment is now the norm for young women. Though single women accept spinsterhood as an alternative life style, society still devalues spinsterhood, and considers it personal failure of the girl/women, kin, neighbours and office colleagues, couch stereotypes of single women in pathological terms, such as lack of attractiveness, too proud and arrogant, deficit in personality, inability to develop intimate relationship with another person, lack of parents’ interest in daughter’s career, and so forth. It is this attitude of society which creates stresses and problems of adjustment for single women.

While the single persons have been on the rise, it is important to investigate whether and how voluntary and involuntary singlehood affects the psychosocial functioning of single young adults. This issue is gaining in importance in light of the fact that although remaining single is becoming prolonged with respect to individuals' lifespan and is increasingly more prevalent, remaining single – especially by choice – leads to negative perception of people making such choices Morris and Osburn (2016). Hence the current study focus on single women's mental health which in turn is likely to affect their physical health as frustration and loneliness which makes them feel insecure, stressed out. They also feel insecure and awkward when deprived of a lot of privileges. This is in the case when have voluntarily opted for their singlehood. While, if their single hood is involuntary, they feel lonely, awkward, and inferior to others which also leads to frustration this leads to deprivation and emotional stress. The researchers also would like to suggest guidelines for making the singleness an acceptable social status in society and providing them with specific institutional means so that they may lead a meaningful, purposeful and socially useful complete social life.

## 1. OBJECTIVES

The purposes of the present study were aims at identifying factors costing single women's mental health which in turn is likely to affect their physical health. The study is based on primary data collected from a sample of 150 single women based in Chembur, Ghatkopar, Vikroli and Matunga suburbs of Mumbai city (using purposive sampling technique) using interview schedule and the data so collected was analysed using factor analysis.

## 2. METHODOLOGY

Current study is majorly based on primary data elicited from 150 respondents using interview schedules administered to single women residing in select suburbs of Mumbai city. The information obtained through the questionnaires will be summarized and structured interviewed schedule and in-depth informal interviews in 2020, to get a meaningful picture of the responses by using SPSS (statistical software).

## 3. RESULTS AND DISCUSSION

The assessment of mental health in terms of internalizing symptoms (such as depression and anxiety) and externalizing symptoms (such as alcohol and substance abuse), mental health is also conceptualized as well-being that is related to subjective wellbeing, psychological well-being, and life satisfaction (Bierman et al. 2006). The mental health is subjective well-being, which has been investigated within the aspect of the hedonic tradition has been widely investigated in studies on emotional well-being, in which measures of satisfaction with life and positive affect are used (Keyes and Simoes 2012) hedonic tradition, in line with which well-being involves happiness and pleasant emotions; and maximizing positive, pleasant feelings, and minimizing negative, unpleasant feelings contributes to the increase of mental health (Lamers et al. 2011). In regard to Keyes' (2002) model of mental health, only a combination of emotional, psychological and social well-being allows for the consideration of mental health.

S.No	Groups	Cronbach's Alpha
1	Voluntary	0.892
2	Involuntary	0.877
3	All	0.833

Source: Estimation based on Field survey

TABLE 1 CRONBACH'S RELIABILITY TEST

Cronbach's Alpha reliability statistics helps to evaluate whether the number of individual items contains the same characteristics to explain the characteristics of the constructs. In the study, the Cronbach's alpha value for Voluntary, Involuntary and all were 0.892, 0.877 and 0.833 respectively, greater than 0.7 indicating the internal consistency of the constructs. Hence, the instrument used in this study had a high reliability value. Factor analysis was done to determine the underlying dimensions of the constructs.

To determine the appropriateness of applying factor analysis the KMO and Bartlett's test measures were computed and the results are presented in table 2 Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy are both tests that can be used to determine the factorability of the matrix as a whole.

Test Measures	Voluntary	Involuntary	All
<b>Kaiser-Meyer-Olkin Measure</b>	0.874	0.851	.865
<b>Bartlett's Test of Sphericity</b>			
(i) Approx. Chi-Square	3446.882	3255.2	6781
(ii) Degrees of freedom	105	105	120
<b>(iii) Significance</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>

Source: Estimation based on Field survey

TABLE 2 KMO AND BARTLETT'S TEST MEASURES

It is suggested that if the Bartlett's test of sphericity is significant, and if the Kaiser-Meyer-Olkin measure is greater than 0.6, then factorability is assumed. The KMO statistics for Voluntary, Involuntary and all respondents were 0.874, 0.851 and 0.865 signifying higher than acceptable adequacy of sampling. Bartlett's test of sphericity was also found to be significant at 1 percent level providing evidence of the presence of relationship between the variables to apply factor analysis.

Table 3 below enlists the Eigen values their relative explanatory powers and the factor loadings for 6 components identified within the data set. The Eigen values greater than one alone was considered for inclusion in the analysis. The above results indicates for the first three factors alone was greater than one for Voluntary , two factors for urban and all respondents indicating that these factors alone were appropriate for inclusion in the analysis. For Voluntary, Involuntary and total respondents, the factors taken together accounted for 76 percent, 73 percent and 61 percent respectively.

For voluntary single women, factor 1 has significant loadings for two dimensions namely frustration and loneliness these variables explain 35 percent of the variance. Factor 2 has significant loading for two dimensions namely feeling emotional stress and insecurity and deprived of a lot of privileges and explains nearly 24 percent of the variance. Factor 3 had significant loading of, namely feeling awkwardness and inferior to others which explains about 18 percent of the variance.

Area Component	Voluntary			Involuntary		Total	
	F1	F2	F3	F1	F2	F1	F2
Feeling emotional stress and insecurity		0.806			0.861		0.844
Feeling deprived of a lot of privileges		0.837			0.863		
Feeling frustrated	0.907			0.727		0.631	
Feeling awkwardness			0.616	0.794		0.713	
Feeling lonely	0.843			0.763		0.834	
feeling inferior to others			0.888	0.917			
Total	2.095	1.437	1.08	2.967	1.402	2.243	1.403
percent of Variance	34.918	23.945	17.993	49.445	23.36	37.382	23.378
Cumulative percent	34.918	58.863	76.856	49.445	72.805	37.382	60.76

Source: Estimation based on Field survey

TABLE 3 Emotional Contentment Assessment

For involuntary single women, factor 1 had significant loadings for four dimensions namely Feeling emotional stress and insecurity, deprived of a lot of privileges, frustrated and awkwardness these variables explain 49 percent of the variance. Divorce or widowhood were found to be associated with an increased risk of feeling lonely, whereas not living alone and having more social support turned out to lower the risk of being lonely (Stickley et al. 2015). Factor 2 has significant loading for two dimensions feeling lonely and inferior to others and explains nearly 23 percent of the variance.

Taking all respondents together, factor 1 had significantly loaded with the factor of feeling emotional stress and insecurity of 37 percent. Remaining in Factor 2 had significant loading on four dimensions namely feeling frustrated, awkwardness, lonely and inferior to others. It explains nearly 17 percent of the variance. The

overall inferences drawn from the above analysis was that there was a strong link between emotional stress and insecurity and singlehood. When compared with individuals in non-marital relationship, single individuals also reported more mental health problems (Braithwaite et al. 2010) and lower emotional well-being (Adamczyk and Segrin 2015)

Social loneliness is related to a perceived deficiency in social networks, or a lack of social relations or social activities (Russell et al. 1984; Weiss 1973). The objective of social isolation or social support, loneliness has been found to be related to negative outcomes in the domain of physical health and to personality disorders, hypochondriasis, schizophrenia, suicidal ideation and behavior, depression, and anxiety (Aanes et al. 2010; Cacioppo et al. 2006). Kearns et al. (2015) in his study reported that, individuals with the worst mental health and well-being were three to five times more likely to report occasional loneliness and three to six times more likely to report frequent loneliness. Furthermore, in a Russian study, lonely individuals were characterized by a significantly increased risk of reporting poor self-rated health, mental health problems and insomnia in the previous twelve months (Stickley et al. 2015).

S.NO	Groups	Cronbach's Alpha
1	Voluntary	0.911
2	Involuntary	0.733
3	All	0.762

Source: Estimation based on Field survey

TABLE 4 CRONBACH'S RELIABILITY TEST

The Cronbach's alpha value for voluntary, involuntary and all women respondents were 0.911, 0.733 and 0.762 respectively, which was greater than 0.7 indicating the reliability of the constructs. Factor analysis was done to determine the underlying dimensions of the constructs. To determine the appropriateness of applying factor analysis the KMO and Bartlett's test measures were computed and the results are presented in table 4.3.20.

	Voluntary	Involuntary	All
<b>Kaiser-Meyer-Olkin Measure</b>	0.92	0.86	0.86
<b>Bartlett's Test of Sphericity</b>			
(i) Approx. Chi-Square	4145.35	5385.07	10189.68
(ii) Degrees of freedom	153	171	171
(iii) Significance	.000	.000	.000

Source: Estimation based on Field survey

TABLE 5 KMO AND BARTLETT'S TEST MEASURES

The KMO statistics for Voluntary, involuntary and all women respondents were 0.92, 0.86 and 0.86 signifying higher than acceptable adequacy of sampling. A value close to one indicates the patterns of correlation as relatively compact. The Bartlett's test of sphericity was also found to be significant at 1 percent level providing evidence of the presence of relationship between the variables to apply factor analysis.

Table 6 enlists the Eigen values their relative explanatory powers and the factor loadings for 5 components identified within the data set. The Eigen values greater than one alone was considered for inclusion in the analysis. Results indicates five factors were greater than one for Voluntary, four factors for Involuntary urban and for all respondents indicating that these factors alone were appropriate for inclusion in the analysis. For Voluntary, involuntary and all respondents, these factors taken together accounted for 60 percent, 69 percent and 62 percent respectively. For Voluntary singlehood women, factor 1 has significant loadings on two dimensions namely, feeling social stigma attached to singlehood and feeling social restrictions imposed. These constructs together explains 33 percent of the variance. Factor 2 has significant loadings on two dimensions namely lack of the feeling of belonging to the family and feel exploitation by kiths and kins which explains nearly 27 percent of the variance.

Area Component	Voluntary		Involuntary		Total	
	F1	F2	F1	F2	F1	F2
There is lack of the feeling of belonging to the family		0.679				0.702

Feel exploitation by kiths and kins		0.865		0.747		0.883
Feeling social stigma attached to singlehood	0.805		0.835		0.801	
Feeling social restrictions imposed on single women	0.616			0.727		
Social boycott or rejection society meets out to single women results in their low social status and social harassment			0.661		0.659	
Total	1.646	1.366	2.256	1.202	1.835	1.249
percent of Variance	32.913	27.33	45.122	24.048	36.703	24.978
Cumulative percent	32.913	60.242	45.122	69.169	36.703	61.681

Source: Estimation based on field survey, 2016

TABLE 6 FACTOR LOADINGS FOR Social Exhilaration

For involuntary singlehood women, factor 1 has significant loadings on two dimensions, namely, feeling social stigma attached to singlehood and Social boycott or rejection society meets out to single women results in their low social status and social harassment. These factors together accounted for nearly 45 percent of the variance. Factor two has significant loadings on feel exploitation by kiths and kins and feeling social restrictions imposed on single women. These factors accounted for nearly 24 percent of the variance.

For the entire sample, factor 1 had significant loadings on two dimensions namely, feeling social stigma attached to singlehood and Social boycott or rejection society meets out to single women results in their low social status and social harassment and explains nearly 36 percent of the variance. In turn, social loneliness is related to a perceived deficiency in social networks, or a lack of social relations or social activities (Russell et al. 1984; Weiss 1973). Factor 2 has significant loadings on lack of the feeling of belonging to the family and feel exploitation by kiths and kins and explains nearly 25 percent of the variance. According to Adamczyk and Segrin (2015) single young adults did not differ in regard to social and psychological wellbeing and total well-being, as well as in regard to somatic symptoms, anxiety and insomnia, social dysfunction, severe depression, and total mental health illness when compared to their counterparts in non-marital relationships.

#### 4. CONCLUSION

In case of voluntary singlehood, desires for professional achievement, self-fulfillment and personal autonomy are responsible for it than the inability to pay dowry, moral responsibility of daughters, in the absence of their brothers, to support old and sick parents, physical deficiencies and deformities which are responsible for involuntary singlehood. Singles are also more likely to socialize with, encourage, and help their friends and neighbors. Similarly, studies of scholars like Lucas, Clark, Georgellis and Diener (2003) and DePaulo (2006) defy the myth that single people are generally not happy. The traditional state of status-incongruence which prevailed and pervaded the lives of single women in India is changing slowly. The stereotypes associated with single women are also changing. Number of people has started recognizing the remarkable adaptability of successful single women and the amount of hard and pioneer work done by them to improve the life of the others in society.

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## Study of Health of Co-operative Bank with respect to PMC Bank: The biggest lessons for Indian Banking Sector

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### ABSTRACT

*Development of country depends on the industrial and agriculture development which requires the proper supply of funds at proper time. Co-operative banking industry in India play an important role in providing credit to small businesses, traders and others. The relatively high levels of NPAs have made these banks health weak and vulnerable. The co-operative banks such as Kapol Co-operative bank, Madhavpura Mercantile Co-operative bank etc. collapsed because of bad management of NPA i.e GNPA, NNPA. The same issue face by the PMC bank recently. The research paper aims to find the problems face by PMC bank related to NPA management. The past performance of PMC bank is analysed by used of different statistical tools such as correlation analysis. The future performance of PMC bank is also forecast by using ARIMA extrapolation model. The study also suggest the measure to avoid such incidence in banking industry.*

*Keywords:* NPA, ARIMA, GNPA, NNPA.

### INTRODUCTION

Co-operative Banks in India have become an integral part of the success story financial inclusion. In India with the enactment of the Co-operative Credit Societies Act 1904 provided for formation of co-operative credit societies. Under the Act of 1904, several co-operative credit societies were started. In India there are thousands co-operative banks and credit societies i.e. 1569 UCB and more than 96000 are rural co-operative banks till March 2019. The share of co-operative banks institution about 8% of total deposits as well as 9% share of total loan and advances of India's banking sector till March 2018 as per source of RBI. There is overall growth in co-operative bank but from year 2004 till 2019 total numbers were declined from 1926 to 1542 as per sources of RBI. Near about 400 co-operative banks are close or merged with other banks. The reason for these is improper management of non-performing assets

### Non-Performing Asset

NPA (non-performing assets) is a banking and finance term. When bank or finance company is unable to recover its lent money from borrower in 90 days, then the amount which has not been recovered will be treated as NPA. It represents bad loans, the borrowers of which failed to satisfy their repayment obligations.

#### Types of NPA

NPA may be classified into

##### a. Gross NPA

Gross NPA is advance which is considered irrecoverable, for which bank has made provisions and which is still held in banks' books of account.

##### b. Net NPA

Net NPA is obtained by deducting items like interest due but not recovered, part payment received and kept in suspense account from Gross NPA.

The Kapol Co-operative bank, Madhavpura Mercantile Co-operative bank etc are the recent examples which recently collapse due to Non- performing asset. The Panjab Maharashtra Co-operative banks is also facing the same problem.

### OBJECTIVES

The study aims at to disclose the detail financial position of PMC Bank. The following is broad objectives of research paper:

1. To study the performance of PMC bank in last 10 years.

2. To find out reason for the Crises of PMC bank.
3. To suggest the measure to prevent such incidence in co-operative banking sector.

## REVIEW OF LITERATURE

A review of the relevant literature has been described as under.

Ravi Kumar, B.V.S.S. Subba Rao, G.D.V. Kusuma (2018), The paper discussed the major causes of increase in NPAs. The tools that have been used in the study were tables and applied arithmetic means, percentage and Garrett Ranking Technique. Based on the data collected ineffective recovery tribunal was the most important reason, followed by Industrial sickness, Change of government policies, Poor credit appraisal system, Wilful defaults, defective lending process, lack of demand, inappropriate technology, managerial deficiencies, improper SWOT analysis, natural calamities and absence of regular industrial visit.

T.R. Bhat (2019), in his article “PMC Imbroglio: Is RBI Regulating urban cooperative banks as Best as It Can?” published in ‘The wire’. The crisis at Punjab & Maharashtra Cooperative Bank Ltd (PMC) has once again raised basic questions over the Reserve Bank of India’s (RBI) role as a regulator and how well it has discharged its job as a guardian of financial stability. The article mentions in detailed regarding the problem of PMC bank and suggest certain preventive measure need to take by RBI.

Shayan Ghosh.(2019), in his article “After PMC crises, tighter norms in place for urban co-operative banks” published in “live-mint” said that the central bank’s intent to tighten regulations for urban cooperative banks. The RBI announced a swing of measures related to UCB’s, including exposure norms, a credit repository and cybersecurity norms. All such seeps indicate that RBI start working very effectively to prevent such problem.

Nikhil Agrwal (2019), in his article “ PMC Bank crisis: 2 account holders die of heart attack, 1 commits suicide” published in live mint showed the seriousness of this scam. at least three stressed account holders have so far died in Mumbai, according to agency report.

Saurbha V. (2019) in his article “PMC Bank crisis: MD’s letter reveals how 21,049 dummy accounts were created to hide HDIL NPAs” published in India Today. Articles consist the highlights such as over 20000 dummy account were used to hide the HDIL NPA. The PMC banks continues to lend the money to HDIL despite default. PMC lend 6500 cr. HDIL which was 73% of banks total assets.

Divyesh S. (2020) in his article “ PMC Bank-HDIL scam: Bank disbursed loans to Wadhawans without record, required forms” published in Business today. Articles said that the scam-riddled Punjab and Maharashtra Cooperative (PMC) bank was used as a personal bank by the accused promoters of HDIL, Rakesh and Sarang Wadhawan. The Wadhawans did this with the help of top officials of the bank. PMC Bank Chairman Waryam Singh was Rakesh Wadhawan’s classmate from college. Managing Director Joy Thomas stated that HDIL helped the bank when it was on the verge of collapse and in turn, he felt indebted to the company when it was in need.

All the above review clearly indicate that PMC is facing deep problem of NPA. But their annual performance of last more than five years showed very rosy picture. The researcher with help of review of literature attempt to find out the fact behind the screen.

## PANJAB MAHARASHTRA CO-OPERATIVE BANKS

The PMC bank (Punjab and Maharashtra Co-operative Bank) is a multi-state. The PMC Bank was started in Mumbai in 1985 and has operations in several Indian states including Maharashtra, Delhi, Karnataka, Goa, Gujarat, Andhra Pradesh and Madhya Pradesh. Honoured by the Reserve Bank of India, PMC bank serves its customers across the country with a strong network of over 137 branch offices.

**Table-1: Performance Highlights of the PMC Bank Ltd**

PARTICULARS	AMOUNT (Rs in Crore)					
	FOR THE YEAR ENDED					
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Total Income	694.45	871.99	966.87	1144.50	1170.06	1,297.98
(-) Total Expenditure	598.93	735.38	827.14	942.23	958.25	1,053.52
Gross profit	95.52	136.61	139.73	202.27	211.81	244.46

(-) Provisions	5.56	12.12	15.78	51.79	42.14	88.18
Profit Before Tax	89.96	124.49	123.95	150.48	169.67	156.28
(-) Income Tax	26.41	46.40	45.47	53.54	68.77	56.59
Profit After Tax	63.55	78.09	78.48	96.94	100.90	99.69
<b>PARTICULARS</b>	<b>AT THE YEAR END</b>					
	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
Own Fund:						
Share Capital	144.58	187.26	241.42	284.51	294.22	292.61
Reserves & Surplus	337.41	435.65	489.45	549.62	617.72	684.58
Deposits:						
Demand	1040.21	1240.76	1447.95	1944.30	2096.36	2,291.37
Term	4647.12	5629.56	6333.52	7067.70	7842.49	9,325.97
Advances:						
Secured	3717.59	4838.04	5486.66	6399.12	7407.33	8,306.90
Unsecured	33.67	41.05	40.88	39.11	50.17	76.43
Working Capital	6499.04	7952.43	8847.91	10320.50	11419.52	13,313.25
Investments	1819.65	1988.41	2363.50	2793.31	2737.95	3,474.55
Borrowing & Refinance	89.47	83.42	144.96	189.23	251.80	305.90
Net NPA (%)	0.19	0.45	0.70	0.96	1.05	2.19
Capital Adequacy Ratio (%)	12.54	12.43	12.20	12.32	12.09	12.62
Number of Members	52738.00	57156.0	60019.00	62264.00	66045.00	51601.00
Number of Branches & Extension Counter	91.00	103.00	114.00	125.00	134.00	137.00
Profit per Employee (Rs in Lakh)	5.18	5.53	5.03	5.77	5.67	5.50
Return on Average Assets (%)	1.00	1.01	0.95	0.98	0.93	0.75
Average Net Interest Margin	4.50	4.29	4.28	4.49	4.38	4.25

Source: Annual Report of the Bank

As of March 2019, its deposits and advances were Rs. 11,617 cr. And Rs. 8,383 Cr. Respectively. It had over 51000 members and about 910000 depositors. Its net profit was Rs. 99.69 Cr. in March 2019, as against Rs. 100.90 Cr in March 2018. The bank's gross NPA(GNPA) were 3.76% and Net NPA were 2.19% of its advances. It had a capital adequacy ratio (CAR) of 12.62%, much above the level of 9% prescribed by RBI. In addition to this the PMC bank was regularly audited by the statutory auditors and by the RBI. It was among the top ten UCBs of the country.

### CRISES AT PMC BANK

On September 24,2019 the RBI issued a notification under sections 35(A) and 56 of Banking Regulation Act restricting the amount that can be withdrawn by the depositors to Rs.1000 for six months (now raised to Rs.10,000) and prohibiting PMC from granting any loans. The board was suspended, and the RBI appointed an administrator to run day-to-day affairs of the bank. The extreme action has been taken by the regulator in the public interest and the interest of the depositors. Why RBI took all such steps against PMC bank with a CAR above its prescribed limit relatively low share of NPAs and stable level of profit what went wrong with the PMC? As per the report PMC banks lends near about 6500 cr. HDIL group which is 73% of the bank's total assets. According to regulation, a single entity exposure limit for banks is 15% of their capital fund while it is 20% for group companies. In HDIL's case the exposure was four times i.e. 73 % It means that something was very properly plan due this even though HDIL started with default in payment of due but not mentioned in the financial statement. In spite of that banks kept misleading the RBI by hiding these NPA by falsifying Advance master Indent and Off-Site Surveillance statements. The employee of PMC Bank ordered by Senior official that to create fictitious account to hide the dues of HDIL. The PMC bank employee to Preparing the OSS statement since 2015 to hide HDIL dues. However, when RBI sough the list of bank's all borrowable accounts as reported

in OSS in 2015, PMC bank started preparing fictitious loan accounts firstly in excel sheet and thereafter these accounts were uploaded or created in the parallel system maintained by the bank for the purpose of RBI inspection/audit. Parallel system was prepared for CBS (Core Banking System) used by PMC i.e. OMNI for period previous to April 13, 2015 and for period after 13 April 2015".

## RESEARCH METHODOLOGY

The present study is an analytical study because it deals with statistical data. The study is based on data for the period of 10 years from the financial year 2009-10 to 2018-19 and secondary data is collected mainly from the sources available at internet like the RBI website, websites of the banks etc. Data is presented with the help of Graphs, charts and tables etc. The main Statistical tools i.e. ARIMA Extrapolation forecast, correlation analysis has been used for processing the data. Auto regressive integrated moving average is a forecasting algorithm based on the idea that the information in the past values of the time series can alone be used to predict the future values.

In ARIMA the following equation is used to forecast the data.

$$Y_t = \alpha + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \dots + \beta_p Y_{t-p} \epsilon_t + \phi_1 \epsilon_{t-1} + \phi_2 \epsilon_{t-2} + \dots + \phi_q \epsilon_{t-q}$$

## Analysis of data

**Table 2: Performance Highlights of the PMC Bank Ltd**

Year	GROSS NPA %	NET NPA %	Return on Average Assets (%)
2009-10	2.53	0.40	0.86
2010-11	1.97	0.47	0.91
2011-12	1.02	0.16	0.93
2012-13	0.98	0.18	0.97
2013-14	0.85	0.19	1.00
2014-15	1.08	0.46	1.01
2015-16	1.38	0.70	0.95
2016-17	1.74	0.95	0.98
2017-18	1.98	1.04	0.93
2018-19	3.76	2.19	0.75

Source: Annual Report of the Banks

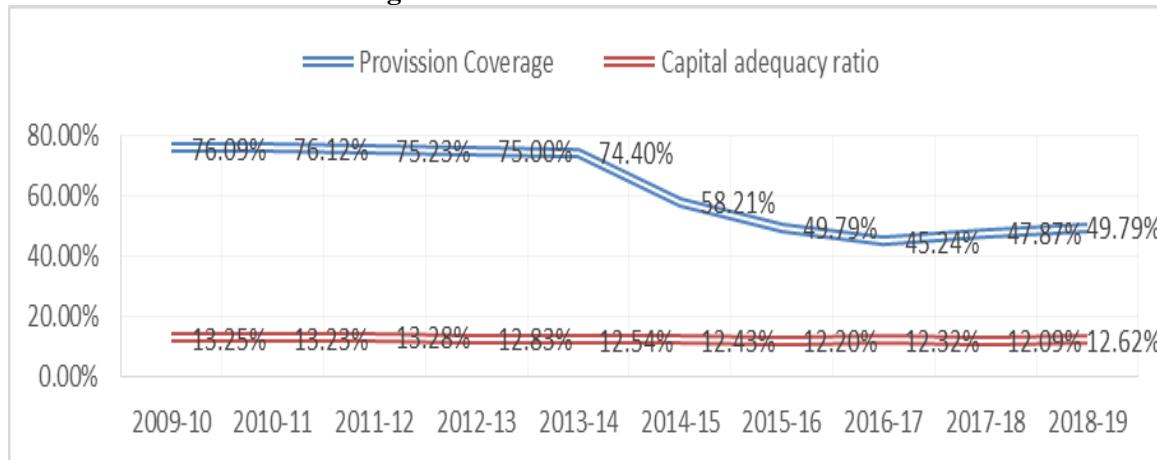
In above Table 2. Which shows the performance of PMC bank over last 10 years GNPA Ratio is increasing over the year which reached to 3.76% also NNPA show the increasing trend i.e 2.19% in the year 2018-19. The both figures is not at all shows the banks is facing problems of Non-performing Asset. The major concern is continuously declined the Return on Investment Ratio i.e. only 0.75

**Table 3: Performance Highlights of the PMC Bank Ltd**

Year	Provision Coverage Ratio %	Capital adequacy ratio %
2009-10	76.09	13.25
2010-11	76.12	13.23
2011-12	75.23	13.28
2012-13	75.00	12.83
2013-14	74.40	12.54
2014-15	58.21	12.43
2015-16	49.79	12.20
2016-17	45.24	12.32
2017-18	47.87	12.09
2018-19	49.79	12.62

Source: Annual Report of the Banks

**Fig 1: CAR & Provision Cover Ratio**



The table 3 & fig. 1 indicate that Provision coverage ratio was only 49.79% but According to the publication of the Narasimha Committee, the RBI published guidelines for making the provision against NPA for all banks including UCBs. The provision should be such that the Net NPA should become zero and CAR capital adequacy ratio (CAR) of 12.62%, much above the level of 9% prescribed by RBI.

**Table 4: Performance Highlights of the PMC Bank Ltd**

Year	ROA %	R0A %	ROA%	ROA%	Average ROA %
2010	0.82	0.84	0.88	0.9	0.86
2011	0.89	0.87	0.94	0.95	0.91
2012	0.89	0.95	0.94	0.95	0.93
2013	0.98	0.96	0.96	0.98	0.97
2014	0.98	1.03	1.02	0.98	1
2015	1.03	1.05	0.99	0.97	1.01
2016	0.96	0.95	0.94	0.95	0.95
2017	0.99	0.97	0.98	0.98	0.98
2018	0.89	0.95	0.94	0.95	0.93
2019	0.7	0.8	0.73	0.77	0.75

Source: Annual Report of the Banks

In table 4. it's clearly indicated that as rate of return of assets banking is continuously declining from 2014-15 i.e. 1.01% to 0.93% in the year 2017-18 but drastic downfall in the year 2018-19 i.e. 0.75%. The data of return on average assets is tested based on ARIMA Forecast model for this above data are divided on quarterly basis.

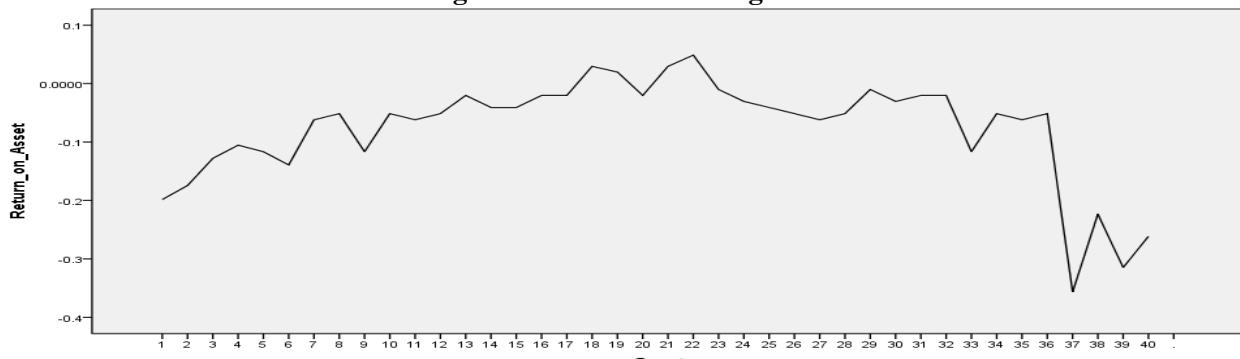
**Table 5: Case Processing Summary**

		Return on Asset
Model Name		ARIMA 101
Series or Sequence		ROA
Transformation		Natural
Series or Sequence Length		logarithm
		41
Number of Missing Values in the Plot	Negative or Zero Before Log Transform	1 <sup>a</sup>
	User-Missing	0
	System-Missing	1

a. The minimum value is .700.

Table 5 about case processing summary indicates the return on assets of PMC banks is transformed by using natural logarithm in ARIMA 101 model

**Fig 2: ARIMA Forecasting Chart**



So

urce: IBM SPSS software

The fig 2. clearly indicate that return on asset of PMC bank is declining. The forecast also show that PMC banks is going to face the problems of return on asset in future.

**Table 4 : Correlation between No-of Fake Accounts & Return On Avg. Asset Ratio**

Particular	No.of Fake accounts	Return on Average Assets (%)
2014-15	2500	1.01
2015-16	12500	0.95
2016-17	17649	0.98
2017-18	21049	0.93
2018-19	22000	0.75

Particular	No.of Fake accounts	Return on Average Assets (%)
No. of Fake accounts	1	
Return on Average Assets (%)	-0.66792032	1

Sources : Author compilation

Table for 4 showed that as no of fake accounts increases the return on average assets are decreased. There is negative co-relation between No of Fake Accounts & Return on Avg. Asset Ratio. As fake accounts increased the return on asset is declined.

### MEASURE NEED TO BE TAKEN BY RBI

Recommendations of successive study groups like the Malegam Committee (2011) and the R. Gandhi Committee (2015). The RBI need to take following measure in the case of UCB to avoid it's collapse.

1. Laying down prudential norms on capital adequacy, accounting standards, classification of assets, provisioning etc.
2. Fixing single/group exposure norms and sectoral exposures.
3. Conducting on-site and off-site supervision.
4. Calling for statutory/other return.
5. Off-site monitoring of the financial position of banks.
6. Initiating supervisory actions against individual UCB to improve the financial position.
7. Giving directions and operational instructions.
8. Imposition of penalty.

### FINDING

1. Performance highlights of PMC bank are showing window dressing of balance sheet as showed in table 1.
2. GNPA and NNPA assets of bank is showed increasing trend as per table 2.
3. The return of investment is declining from the year 2014-15 till 2018-19.
4. CAR ratio is also good i.e 12.62% as it is more than 9 as per RBI limit.

5. ARIMA Extrapolation forecast of ROI indicate that d
6. No. of fake accounts of PMC banks is increasing over the period of 5 years. All such accounts were created to hide the NPA as showed in table 4.
7. ROI and Fake accounts are negatively co-related with each other which means as NO. of Fake accounts increases the ROI is decrease.

## CONCLUSION

After serving more than 44 years PMC bank reached to top 5 position in UCB ranking and collapsed. Overfunding i.e 73% of total assets to one organisation created such problem. The banks official managed financial statement in such manner to hide the actual position. Near about 22000 fake accounts are created to hide the dues of HDIL group. The problem was started from the year 2015. Therefore, bank official need to reveal the fact but in order to protect personal interest they hide it. All depositor of PMC who save their life saving are facing serious financial problems. Some depositor also lost their life due such financial crises. If such problems are overlooked than whole Indian banking sector will be suffer in the future. The PMC crises is biggest lesson to Indian Banking Sector. RBI need to follow the certain measure such as laying down all the norms, conducting offsite and onsite supervision, supervisory action against each UCB to improve financial position etc. There is need to have good support from UCB's official and management while applying such measure. Then such financial crises will be control in future.

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## Application of Power BI for Analysis of Freight Movement in Indian Railway Freight Services

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### ABSTRACT

*Indian Railways runs roughly 19,000 trains daily, comprising of 7,000 freight trains. It operates across 7,146 stations and is one of the largest transporting networks of commodities and passengers across the world [7]. Though, only one third of the total trains running in our country is Freight Train, Freight Traffic accounts for two third of the total income from Railways, as the passenger services are greatly subsidized [6]. But, today Indian Railways Freight Services is facing adversities due to tough competition from other means of transport and subsequently, its share in Freight Transportation of the country, is diminishing year by year. Railway is facing a huge infrastructural crunch because of the increasing number of both Freight and Passenger trains. The routes and terminals used by both Freight and Passenger Services are common. Work on DFC (Dedicated Freight Corridor) has started but it is being done in an incremental manner and it would take a very long time to cover all major routes [7]. If more wagons, routes, terminals, sidings and yards are made available, then definitely Railways can increase its revenue. But for this, detailed analysis of the movement of rakes needs to be done so that the bottlenecks can be identified and corrective steps can be taken to smoothen the flow of Railway Traffic. Power BI is a data analytics tool which helps to bring together data in different format from across different sources into reporting dashboards [4]. This helps organizations in taking prompt and correct managerial decisions. This paper aims to analyze the movement of wagons using Power BI so that Operation and Traffic Management of Freight trains can be optimized.*

**Keywords:** Wagons, BOXN, BCN, Commodity, Visualization techniques, Scatter charts, Decision Support

### 1. INTRODUCTION

Freight transportation through rail routes has many advantages. It is environment friendly as it causes less pollution. It is very fuel efficient as it can transport 6 times the traffic carried by Roadways using same amount of fuel. Also, Railways makes optimum use of land. Indian Railways ships various goods and fuels in industrial, agricultural and consumer segments across the length of India. It is major transporter of raw material to industries across our country and hence plays a very important role in industrial development of our country [3]. But recently, it is suffering from great losses due to huge subsidies it offers to passenger services. Presently, IR gives 53 major types of concessions to public including senior citizens, physically challenged persons, gallantry awards recipients etc [10]. Operating ratio is operating expenses as a percentage of revenue. Indian Railways has the worst operating ratio in the last ten years at 98.44% and its revenue surplus has decreased by more than 66% from Rs. 4913 crore in 2016-17 to Rs. 1665.61 crore in 2017-18 [5]. Hence, to come out of this deteriorating situation, Railways must concentrate on proper resource management, so that Freight Services can generate more and more revenue to balance the loss due to Passenger Services.

### Operation of Freight Services

Mostly goods are transported through Block Rakes, where a Full Rake consists of 40 BCN wagons or 58 BOXN wagons. Some goods trains are run as timetabled, but mostly, they are run as and when the requirement arises. The process of running such goods train is known as ordering of goods trains. It involves the issuance of written advice to the yard, station and loco shed regarding the train which will run. For requesting a wagon, client has to submit an indent, after which wagon is supplied and it has to be loaded within allocated time. After loading, rake is sealed and dispatched. Once the train reaches destination, it has to be unloaded in allocated time. This loading and unloading is done at terminals, yards or sidings. Nowadays, even Private Companies operate in India and own yards, wagons, sidings etc. These companies are given licenses to operate container services on specific routes for a specified period of time [12].

Following types of wagons are used in Indian Railways for transporting goods [12]:

**BOXN:** High sided bogie open wagon with pneumatic brakes, cast steel bogies. It is the most common wagon. Used for carrying bulk commodities like coal, iron ore, stone etc.

**BOXNS:** These are BOX wagons with side discharge.

**BOXNHL:** Similar to BOXNS wagon but are 250 mm longer and made up of stainless steel.

**BOXNEL:** These are BOXN wagons with “enhanced loading” features.

**BCN:** Bogie covered 8-wheeler wagon, used for carrying bagged commodities.

**BCNHL:** Covered Bogie Wagon for Heavy Load. It is used for bulk movement of cement, food grains, fertilizers etc.

Freight operations become very complex due to following factors:

- Fluctuations in demand for wagons.
- Different commodities require different type of wagons.
- Varying time taken for loading or unloading depending on whether it is manual or mechanical.
- Wagon maintenance, sick wagon detaching, attaching fit wagons.

Power BI is a Business Intelligence and Data Visualization tool that transforms data from various data sources into interactive dashboards and reports. Here, in this Research work, Power BI has been used to generate different types of charts to view the pattern of loading and movement of rakes through rail routes across India, to gain insight. This would help policy makers to implement such policies which could benefit Indian Railways in long run by optimizing asset management.

## 2. LITERATURE REVIEW

Abhivakti, Volume 23(2011), emphasizes on the fact that heavy subsidy on passenger services affects the cost of freight services and hence the overall economy because due to this increase in cost of freight services, there is a general increase in cost of different commodities and services. Narayan Rangaraj and B.N.Vishnu of IIT Bombay [2016] concluded that for optimal utilization of resources in Indian Railways, efficient management freight terminals is very crucial[14].G.Raghuram and GangwarRachna (2008) concluded that 70 per cent of the total revenue of Indian Railways comes from its freight operations [18]. According to Sharma and Manimala (2008), Indian Railways show operational inefficiency [19]. G. Alivelu[2010], found out that availability of wagons is a big problem due to shortage of wagons for freight movement. Since, the supply is less than demand, rail traffic is being lost to other means [15].Even Pavlyuk Dmitry (2008) thinks that the operational and technical efficiency of Railways Services depends of optimum utilization of resources [20]. Going by 2019 Budget, Indian Railways has set a target to raise its freight traffic from current 1.1 billion ton to 3 billion ton by 2030 [9]. The objective is to increase the share of Railways in the overall freight shipment from the existing share of 35 per cent to 50 per cent. Many Railway Lines have already crossed the 100 per cent line capacity utilization limit, hence conceding safety and resulting in slowing the speed of freight wagons. All these above facts put emphasis on how important it is to optimally manage the assets of Indian Railways in order to maximize the revenue.

## 3. RESEARCH METHODOLOGY

### 3.1. Research Problem

Terminals, Rail Routes, Wagons, Sidings, and Yards are very pertinent and overstrained resources and effort has to be made to identify patterns in Freight Movement so that proper steps and decisions can be taken to remove wastage of important assets because in one place they are lying dormant where in other places they are very much required. Only when concrete patterns are discovered, proper steps can be taken towards effective resource management for optimal revenue generation.

### 3.2 Research Objective

This work aims to gain insight into the Freight Traffic of Indian Railways using data analysis tool Power BI. This would provide a solid base for further research and corrective actions can then be taken for better management of Freight Traffic.

### 3.3 Scope

The data used for this research work is primary data which was provided by FOIS (Freight Operations Information System) on request. This data was recorded for financial year 2018-19 and it covers all rail routes across India. This work covers two categories of wagons-BOXN and BCN.

### 3.4 Data Analysis and Observation

Data of around 90 MB was used to generate different types of charts. Data was originally stored in MS Excel files. Data for BCN and BOZN rakes is recorded in separate files. Here data was extracted to Power BI from excel, incomplete records were removed, unnecessary fields were removed, additional custom and conditional columns were added to generate values of season, Loading Time, Placement Delay and Dormant time etc. for wagons.

**Loading Time** is the time taken to load the rakes, i.e. time (in hrs) between Release Time and Placement time.

**Placement Delay** is the time (in hrs) between arrival time and placement time of a rake.

**Dormant Time** is the time (in hrs) for which a rake lies idle.

**Season** is denoted by Q1, Q2, Q3 and Q4 on the basis of its placement date. Q1 is first quarter of financial year (April to June) while Q4 is last quarter (January to March).

Once the data is integrated from various files, relationship was drawn between the related datasets to get a clear visual interpretation of facts. Then the records were grouped by Originating station (STNFROM), Commodities, Season and their movement across rail networks was analyzed.

Following **charts** and **tables** were generated:

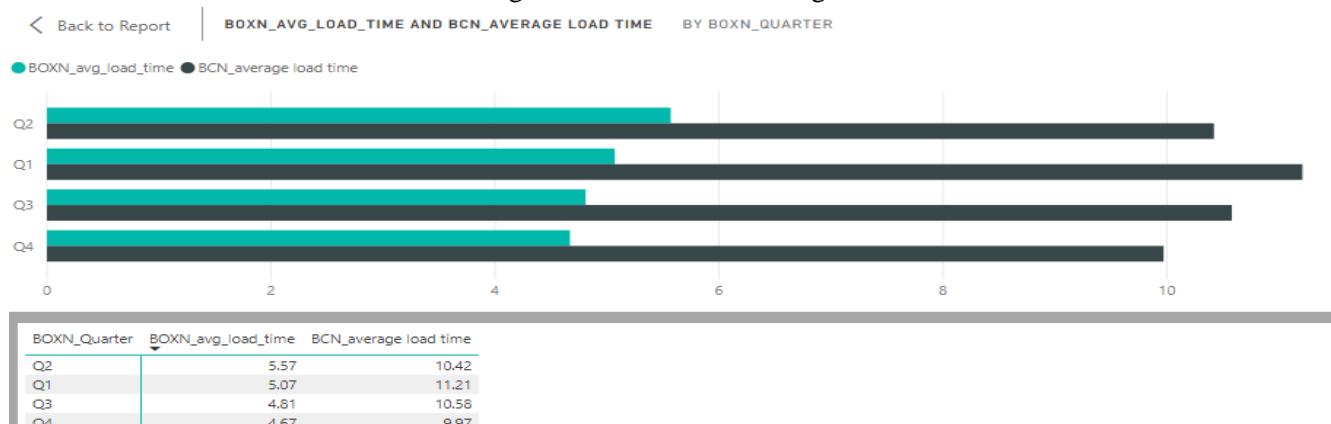


Fig 1: Comparison of Average Load time of BCN and BOZN Wagons (In Hrs) Season-Wise

COMMODITY	BCN_Count	BCN_AVG LOAD TIME	COMMODITY	BOXN_Count	BOXN_avg_loading_time
CEMT	25239	10.47	PHC	65713	4.94
FERT	11259	9.85	IMCL	21213	3.71
IMFT	4121	8.19	IORE	18181	3.77
STON	3882	11.35	CLKR	9839	5.69
SALT	1368	10.48	PBC	7215	4.49
SUG	1161	16.85	SLAG	2650	8.25
MIXD	909	8.79	BAUX	2037	4.05
ASH	622	8.77	IMOR	1622	4.94
ONIO	470	14.3	EXOR	1260	4.01
BALT	382	10.27	GYP	1107	5.39
FG	270	14.5	STON	793	6.83
EOIL	232	18.59	IMFT	440	9.13
SAND	231	16.05	BALT	400	4.9
GYP	157	10.67	FERT	342	10.31
IORE	104	10.68	MIXD	142	4.95
FODR	96	12.15	CEMT	118	11.91
PHC	55	10.26	SAND	81	11.79
IMCL	41	10.08	CLAY	16	5.24
SLAG	33	11.3	METL	15	6.46

Fig 2 : Commodity wise count of BCN and BOZN wagons and their average loading time (In Hrs)

# Our Heritage

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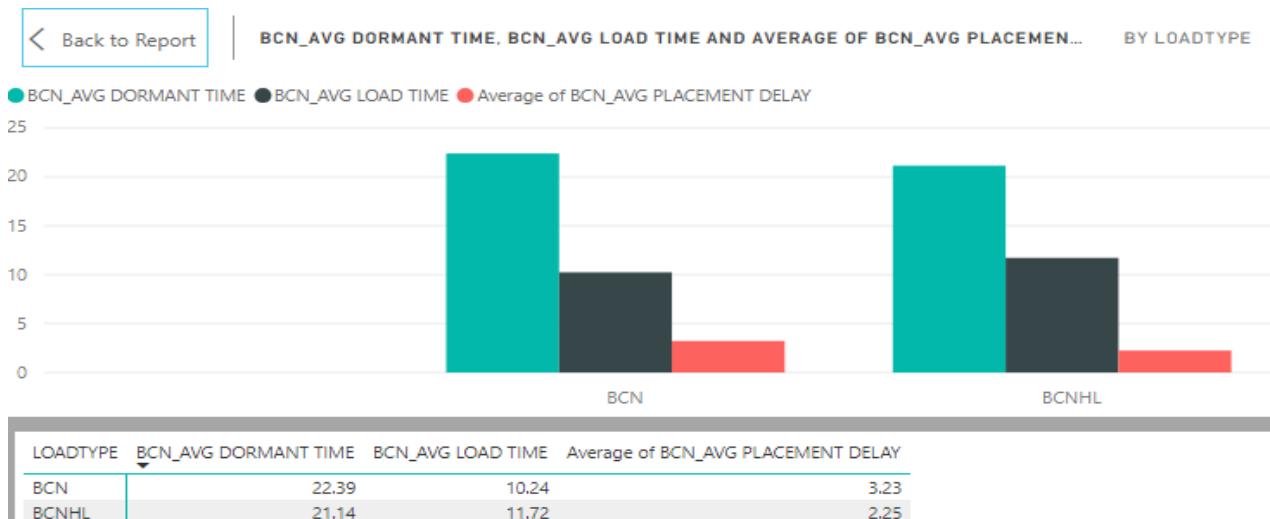


Fig 3: Average Load Time, Dormant Time and Placement Delay of BCN Wagons (In Hrs)

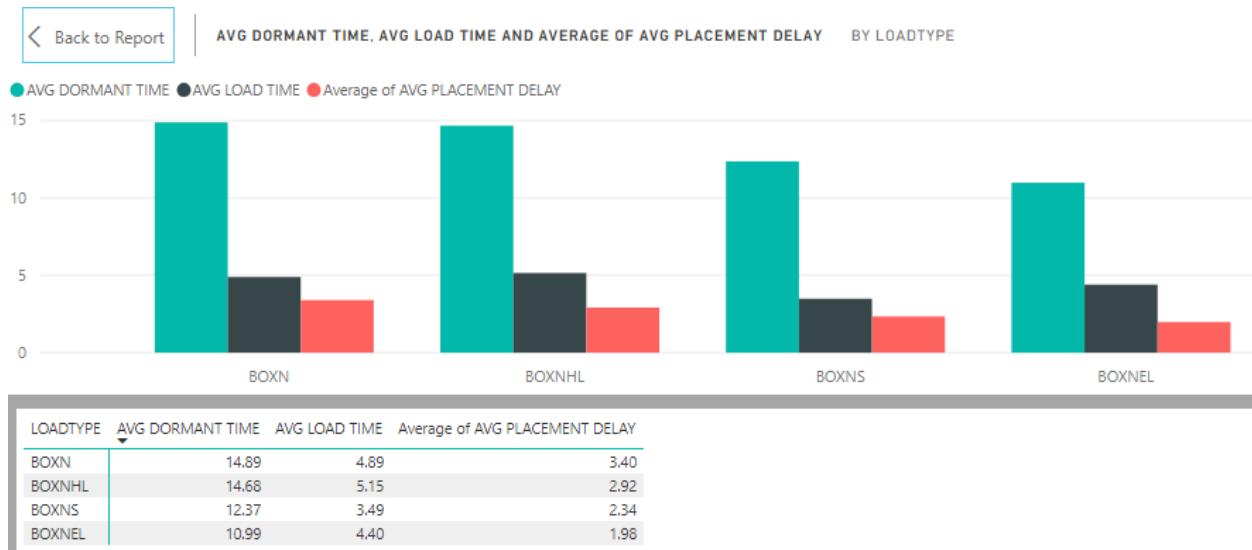


Fig 4: Average Load Time, Dormant Time and Placement Delay of BOXN Wagons



Fig 5: BOXN and BCN Count Season-Wise

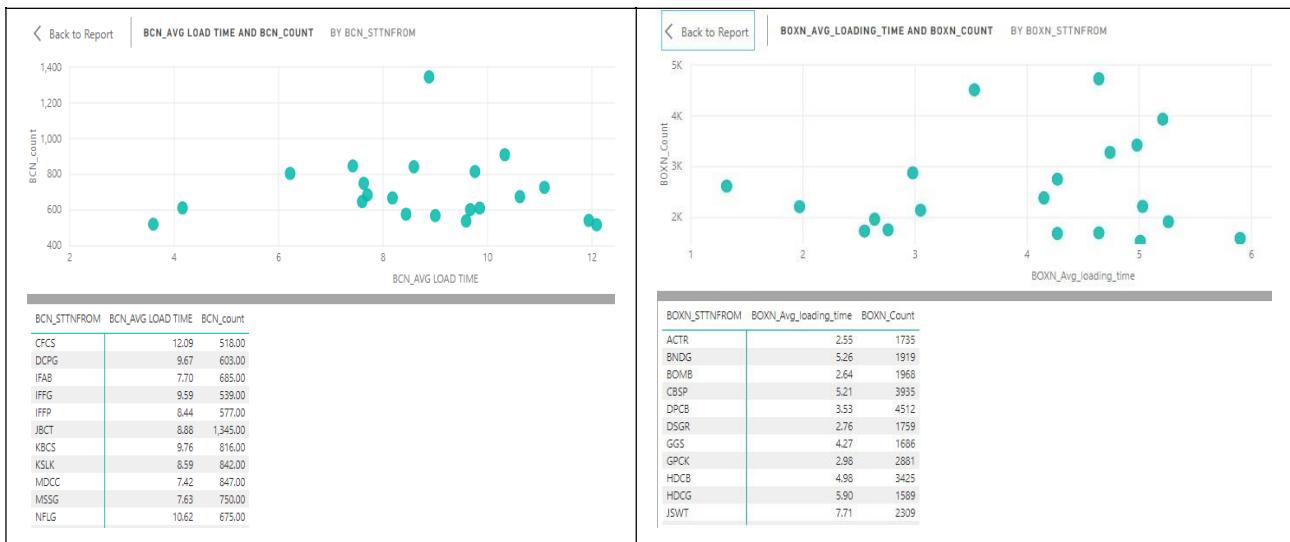


Fig 6: Count of BCN and BOXN rakes and their Average Load Time on various Originating Stations

From above figures, following preliminary observations were made:

- Fig 1 indicates that average load time of BOXN is much less compared to BCN rakes. Load Time for BOXN varies from 4.7 hrs to 5.57 hrs with maximum load time in Quarter2 (Rainy Season) whereas for BCN rakes average load time varies from 9.97 hrs to 11.21 hrs.
- From Fig 2 it can be seen that for BCN rakes, Cement loading is most frequent followed by fertilizer, imported fertilizer, stone etc whereas for BOXN rakes, Petroleum and Hydrocarbon (PHC) is most commonly loaded followed by imported coal (IMCL), Iron ore, clinker etc. But surprisingly, there is no correlation between the number of rakes being loaded annually and average loading time.
- According to Fig 3, average Dormant Time, Load Time and Placement Time for BCN is 22.39hrs, 10.24 hrs and 3.23 hrs respectively. For BCNHL, these are 21.14 hrs, 3.23 hrs and 2.25 hrs respectively. This shows that newer enhanced wagons are saving time.
- Fig 4 shows that average Dormant Time, Load Time and Placement Time for BOXN is 14.89 hrs, 4.89 hrs and 3.40 hrs respectively. For BOXNHL, these are 14.68 hrs, 5.15 hrs and 2.92 hrs respectively. For BOXNS, these are 12.37 hrs, 3.49 hrs and 2.34 hrs respectively and finally for BOXNEL, these are 10.99 hrs, 4.40 hrs and 1.98 hrs respectively. This indicates that BOXNS is most efficient as it has provision for opening from side also.
- Fig 5 indicates that number of BOXN rakes being used is much more than the BCN rakes. It varies from 38038 in Q2 to 41176 in Q4. Number of BCN rakes ranges from 16972 in Q2 to 17480 in Q3.
- Scatter charts of Fig 6 shows the Average Loading Time and Count of Rakes being loaded at various Originating Stations annually. Surprisingly, there is no visible correlation between the number of rakes being loaded and the average loading time at these stations.

## 4. CONCLUSION AND FUTURE SCOPE

The Data Analysis done above can form the basis for further research. The reasons behind these visible patterns can be drilled out through various means like questionnaires etc. Also prediction can be made for future flow of traffic on the basis of past data by using various techniques of machine learning. And accordingly, traffic can be distributed across existing and new Rakes, Rail Networks, Sidings, Yards and Terminals. This way Railway assets would be managed efficiently and this would play great role in boosting the dwindling traffic and Revenue of Indian Railways and hence in improving the economy of our country.

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## Emotional Intelligence and Mental Health: An Exploratory Study

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### ABSTRACT

When viewed through a developmental lens, one's college years mark a critical transitional period in their lifetime. In the recent years, there have been growing concerns regarding the mental health of college students in India (Bhat et al., 2016; Mutalik et al., 2016). Studies have demonstrated significant associations between emotional intelligence (EI) and mental health (Bastian et al., 2005; Schutte et al., 2007). The primary objective of this paper was to study mental health in relation with emotional intelligence. The instruments used in the current study included the Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF; Petrides, 2009) to measure students' global trait EI and its four factors, as well as the Kessler Psychological Distress Scale (K10; Kessler et al., 2002) and the Satisfaction With Life Scale (SWLS; Diener et al., 1985) to assess their mental health in terms of their perceived levels of psychological distress and life satisfaction, respectively. Data was collected through the means of an online survey from a sample of 120 undergraduate students in India, with 40 students each from the streams of Arts, Science, and Commerce. A quantitative analysis of the obtained data was carried out by employing descriptive and inferential statistical methods, including Pearson's correlation coefficient 'r.' The results revealed a significant, positive correlation between emotional intelligence and psychological distress, and a significant, negative correlation between emotional intelligence and life satisfaction. These findings have promising implications for fostering the positive mental health of undergraduate students. The limitations of the current study and suggestions for future research have also been discussed.

**Keywords:** Emotional intelligence, mental health, psychological distress, life satisfaction, undergraduate students

### INTRODUCTION

The last two decades have witnessed a sixfold increase in the tertiary student population of India, with the total enrolment in higher education estimated to be 36.6 million in 2017-18 (Department of Higher Education, MHRD, 2018). This expansion has brought with itself a colossal wave of academic and social pressures. Recent studies indicate that the mental health of the college students in India has been deteriorating (Bhat et al., 2016; Mutalik et al., 2016). On that account, their mental health merits critical inquiry and intervention. One way to foster their well-being may be to assist students in acquiring skills to effectively handle stressful life events.

The construct of emotional intelligence has sparked widespread interest in educational, organizational, and clinical settings. Its historical roots can be traced back to 1920, when E. L. Thorndike conceived the idea of social intelligence. In 1990, Peter Salovey and John D. Mayer became some of the first to employ the term "emotional intelligence," and developed the framework for ability EI. Regarding the objectivity of ability-based EI as problematic because it undermines the subjective nature of emotional experience, K. V. Petrides has developed on the trait-based model of EI. Petrides, Frederickson, and Furnham (2004) defined trait emotional intelligence as "a constellation of behavioral dispositions and self-perceptions concerning one's ability to recognize, process, and utilize emotion-laden information" (p. 278).

**There has been a frenzy of frameworks to operationalize the concept of mental health. According to the World Health Organization, mental health is** "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (as cited in WHO, 2004, p. 10). It emphasizes that mental health is not just the absence of mental disorder. Keeping this in mind, the current study describes mental health in terms of the variables of the psychological distress and the life satisfaction experienced by an individual.

The rationale of this study was to examine the mental health of undergraduate students in relation with their emotional intelligence. The authors hope to cast light on their relationship in an Indian context, and further call to attention the positive implications of improving the emotional intelligence of college students.

## REVIEW OF LITERATURE

Research studies conducted in the past have explicated the relationship between the study variables. Gupta and Kumar (2010) conducted a study with a sample of 200 students drawn from the Science and Arts streams of Kurukshetra University, India. Results indicated that emotional intelligence and self-efficacy have a positive correlation with mental health as measured by *Jagdish and Srivastava (1983)'s Mental Health Inventory*. Yadav et al. (2017) found similar results in a sample of 80 students from Banaras Hindu University.

In one meta-analysis of 44 effect sizes based on the responses of 7898 participants, Schutte et al. (2007) found that emotional intelligence was significantly associated with three types of health indicators, namely physical, mental, and psychosomatic. Trait emotional intelligence was found to be more strongly related to mental health than ability-based emotional intelligence. Bastian, Burns, and Nettelbeck (2005) found that higher emotional intelligence was associated with higher life satisfaction, better perceived problem-solving and coping ability, as well as with lower anxiety. Furthermore, self-report EI measures seemed to have stronger correlations with these life skills than did the ability EI measure.

In a stratified sample of 350 students from an Iranian university, Jamkhaneh et al. (2014) found a negative correlation between emotional intelligence and components of mental health, including anxiety, social dysfunction, and depression. Significant differences were found in the emotional intelligence and mental health of students from the fields of Accounting, Law, English language, and Management. Bhat and Farooq (2017), who collected data from a random sample of 59 university students, found that students who manage their emotions effectively are likely to feel relatively less vulnerable in anxiety-provoking situations.

A study by Ramachandran, Hamsan, and Khir (2018) demonstrated a positive correlation between emotional intelligence and life satisfaction in a sample of 600 undergraduate students from four Malaysian universities. Participants, all of whom fell within the age range of 18 to 26 years and had diverse religious backgrounds, were pursuing various different bachelor's degrees.

## METHODOLOGY

### Objective

The primary objective of the study is to investigate the relationship between the emotional intelligence and the mental health of undergraduate students. Furthermore, it aimed to study the differences in scores on the study variables among students from the streams of Arts, Science, and Commerce.

### Hypothesis

It was hypothesized that there exists a significant correlation between the emotional intelligence and the mental health of undergraduate students. That is:

$H_1$ : There is a significant correlation between the emotional intelligence and the levels of psychological distress experienced by undergraduate students.

$H_2$ : There is a significant correlation between the emotional intelligence and the levels of life satisfaction experienced by undergraduate students.

### Variables

The study variables were trait emotional intelligence and mental health described in terms of the levels of psychological distress and life satisfaction experienced by students.

### Sample

The study population comprised undergraduate students from various colleges all across India. Data was collected from a sample of 120 students, with 40 students each from the streams of Arts, Science, and Commerce. In the sample, there were 79 female students and 41 male students. All the participants fell within the age range of 18 years to 22 years.

### Instruments

*Emotional Intelligence* It was measured using the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF; Petrides, 2009). It consists of thirty self-report items rated on a 7-point Likert-type scale ranging

from 1 (completely disagree) to 7 (completely agree). It yields a measure of global trait EI and its four factors (Well-being, Sociability, Emotionality, Self-control).

*Psychological Distress* It was measured using the *Kessler Psychological Distress Scale* (K10; Kessler et al., 2002). It consists of ten self-report items rated on a 5-point Likert-type scale ranging from 1 (none of the time) to 5 (all of the time). It yields a global measure of psychological distress based on an evaluation of the self-reported anxiety and depressive symptoms that an individual has experienced in the most recent 4 week period.

*Life Satisfaction* It was measured using the *Satisfaction With Life Scale* (SWLS; Diener et al., 1985). It consists of five self-report items rated on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). It yields a measure of global cognitive judgments of one's life satisfaction.

## Procedure

This study collected primary data through an online survey comprising of structured questionnaires that were administered to the sample via the platform of Google Forms. There was one composite survey divided into four sections, with the first section consisting of demographic questions, followed by three others for the three scales, respectively. All the participants were assured that anonymity will be maintained.

## RESULTS

The data analysis was quantitative in nature, employing the methods of descriptive statistics and inferential statistics. The results obtained are as follows.

	N		Global EI	Well-being	Self-control	Emotionality	Sociability
ARTS	40	Mean	4.61	4.93	4.14	5.12	4.12
		SD	<b>0.66</b>	<b>0.88</b>	<b>1.06</b>	<b>0.79</b>	<b>0.79</b>
SCIENCE	40	Mean	4.39	4.64	4.15	4.42	4.46
		SD	<b>0.68</b>	<b>0.96</b>	<b>0.98</b>	<b>0.91</b>	<b>0.96</b>
COMMERCE	40	Mean	4.56	5.12	4.11	4.37	4.65
		SD	<b>0.68</b>	<b>0.94</b>	<b>0.86</b>	<b>0.82</b>	<b>1.12</b>

Table-1: Descriptive Statistics for Emotional Intelligence

Table 1 summarize the descriptive statistics of the three groups for the variable of trait Emotional Intelligence. The average scores for global trait EI obtained by Arts, Science, and Commerce students were found to be 4.61, 4.39, and 4.56, respectively. Mean scores on the four factors were also determined, as depicted in the table.

	N		Psychological Distress	Life Satisfaction
ARTS	40	Mean	23.95	19.78
		SD	<b>7.51</b>	<b>6.46</b>
SCIENCE	40	Mean	25	18.28
		SD	<b>8.95</b>	<b>6.46</b>
COMMERCE	40	Mean	23.53	19.30
		SD	<b>7.69</b>	<b>6.01</b>

Table-2: Descriptive Statistics for Psychological Distress and Life Satisfaction

Table 2 summarize the descriptive statistics of the three groups for the variables of psychological distress and life satisfaction. For psychological distress, the average score obtained by Arts students was found to be 23.95 (SD = 7.51). The average score obtained by Science students was found to be 25 (SD = 8.95). The average score obtained by Commerce students was found to be 23.53 (SD = 7.69). For life satisfaction, the average score obtained by Arts students was found to be 19.78 (SD = 6.46). The average score obtained by Science students was found to be 18.28 (SD = 6.46). The average score obtained by Commerce students was found to be 19.30 (SD = 6.01).

The descriptive statistical analysis performed on the data indicated that the data was fit for performing further parametric tests. A correlational analysis was conducted between the three variables using Pearson's product-moment correlation coefficient.

Variables	N	'r' value
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<b>Emotional Intelligence and Psychological Distress</b>	120	-0.52365**
<b>Emotional Intelligence and Life Satisfaction</b>	120	0.405806**
<b>Psychological Distress and Life Satisfaction</b>	120	-0.3851**

\*\*. Correlation is significant at the 0.01 level

Table-3: Correlations between the Study Variables

The results from the correlational analysis revealed that there are significant correlations between all three sets of variables. A moderate, negative correlation was found between emotional intelligence and psychological distress ( $r = -0.52365$ ,  $p < 0.01$ ). A moderate, positive correlation was found between emotional intelligence and life satisfaction ( $r = 0.405806$ ,  $p < 0.01$ ). A moderate, negative correlation was found between psychological distress and life satisfaction ( $r = -0.3851$ ,  $p < 0.01$ ).

## DISCUSSION

In the wake of the deteriorating mental health of the college students of India, the current study was conducted. The results obtained confirm the two hypotheses. A significant, negative correlation was found between trait emotional intelligence and psychological distress. Although correlation does not imply causation, it can be inferred that students who have higher emotional intelligence are likely to experience relatively lower levels of psychological distress, and vice versa. A significant, positive correlation was found between trait emotional intelligence and life satisfaction. It can be inferred that students who have higher emotional intelligence are likely to experience relatively greater levels of life satisfaction, and vice versa.

As an ancillary observation, the results from the descriptive statistical tests were analyzed. They revealed that the difference between the scores on the three measures obtained by students from the three streams were not large enough to be remarkable. Nevertheless, these differences have been outlined as follows. The global trait emotional intelligence of Arts students was found to be the highest, followed closely by Commerce students, and then Science students. Perhaps this can be attributed to the greater emphasis that Arts and Humanities courses lay on the exploration of the subjectivity of the human condition as compared to the other streams. However, it may also be because students with higher emotional intelligence have an inclination for Arts and Humanities.

An analysis of the scores on individual dimensions indicates that the scores of students on the well-being factor descended along the streams of Commerce, Arts, and Science. There was a notable difference in the emotionality levels of students, which Arts students scoring the highest. The social skills of students declined along the streams of Commerce, Science, and Arts. The self-control skills of the students of the three streams seem to parallel each other in comparison. This factor encompasses the facets of emotion regulation, impulsiveness, and stress management. Students from all three streams scored remarkably low here, which indicates the need for intervention in this area.

Overall, the degree of psychological distress experienced by the students was found to be moderate. Since a score higher than 22 indicates the risk of developing a mental disorder (Andrews & Slade, 2001), this raises concerns about students from all three streams. The psychological distress of Arts and Commerce students was on par, but Science students exhibited slightly elevated levels of anxiety and depression symptoms. In contrast, the level of life satisfaction experienced by Science students was the least, followed by Commerce students, and then, Arts students. Science students may have relatively higher distress and lower satisfaction because they were found to have the lowest emotional intelligence. However, various other factors come into play here. The causes for this and the differences in scores between the students from the three streams require further investigation.

The above findings call for the integration of emotional intelligence into the current curriculum of colleges. Not only will this make students better equipped to handle and cope with emotionally laden situations during this critical transitional phase, but also have a positive impact on their overall mental health. Studies have found that emotional intelligence is also positively associated with academic achievement (Norhaslinda and Norhafizah, 2013; Suleman et al., 2019).

It has been established that emotional competencies can be acquired through learning (Cherniss & Goleman, 2001). Nelis et al. (2009), Delport (2014), and Schoeps, de la Barrera, and Montoya-Castilla (2019) tested intervention programs for developing emotional intelligence, and found showed significant improvements in the training group's mental health and well-being, among other positive outcomes.

Emotional intelligence, and in extension, social intelligence are of great importance in a collectivistic nation like India. Intervention programs explore both intrapersonal and interpersonal aspects of emotions through the means of lectures, the sharing of stories and anecdotes, group discussions, demonstrations, role plays, simulated games and activities, and journal writing for keeping records. Since students in the current sample were found to be relatively deficient on the self-control factor of emotional intelligence, training programs could lay special emphasis on developing skills in emotion regulation, impulsiveness, and stress management.

## IMPLICATIONS FOR FUTURE RESEARCH

In the future, a larger sample can be used to increase the generalizability of the results. Both self-report trait EI and ability EI measures can be employed, and the scores on the two can be compared. Furthermore, a comparative study could be carried out to investigate whether gender differences exist in the emotional intelligence of students. The causal relationships between the study variables can also be explored. This study did not consider the role of mediating and/or moderating variables, such as personality dispositions, affective states, motivation, or situational variables regarding specific college campuses, which could have had an impact on the results. Finally, researchers can design intervention programs to enhance emotional intelligence and conduct pre- and post-training evaluations to examine their effectiveness. Thus, future studies can refine and further develop on these findings.

## CONCLUSION

The current study examined the relationship between the mental health and the emotional intelligence of undergraduate students in India. Results established that trait emotional intelligence is negatively correlated with psychological distress and positively correlated with life satisfaction. Furthermore, the overall levels of distress as well as satisfaction experienced by the students were found to be moderate, with mean scores of students from all three streams indicating the risk of developing a mental disorder, which calls for intervention and enhancement of positive mental health.

Although correlation does not imply causation, the study highlights the instrumental role played by emotional intelligence in promoting the well-being of students. This finding has promising implications for the curriculum design of the higher education institutions of India. Interventions and training programs should be designed for facilitating the development of emotional intelligence among college students and harness its potential to foster positive mental health.

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## Different Cloud Models For Different Business Use Cases

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### **ABSTRACT**

*Organization select cloud models based on their business scenario. There are two main models in cloud computing, deployment model and service model. Deployment models define the type of access to the cloud, i.e., how the cloud is located? In this paper, we will put more focus on cloud deployment model, its type and different scenarios where it can be used. To know which deployment model matches business requirement it is necessary for users as well as learners to understand the three most common deployment model which are public, private and hybrid cloud delivery models. After understanding the characteristics and benefit of deployment model, we will be in a better position to select the cloud deployment model for our business scenarios.*

*Keywords: Cloud deployment models, public, private, Business Scenarios, Use cases.*

### **36. INTRODUCTION**

Now a day, Cloud computing is the hot technology which is used in IT industries. Most of the organizations have IT department in place and are trying to migrate to cloud. It offers online data storage, infrastructure, and application. As we know, cloud computing provides us means of accessing the applications as utilities over the Internet. It allows us to create, configure, and customize the applications online. Cloud Computing refers to manipulating, configuring, and accessing the hardware and software resources remotely. Cloud computing offers platform independency, as the software is not required to be installed locally on the PC.

There are certain services and models working behind the scene making the cloud computing feasible and accessible to end users. There are two main working models for cloud computing, one is service models and other is deployment models. Cloud service models come in three types: SaaS (Software as a Service), IaaS (Infrastructure as a Service) and PaaS (Platform as a Service). Each of the cloud service models has their own set of benefits that could serve the needs of various businesses. Choosing between them requires an understanding of these cloud service models, evaluating your requirements and finding out how the chosen service model can deliver your intended set of workflows.

### **37. SERVICE MODEL**

We will discuss in brief about the three types of cloud service models and their benefits. Firstly, we will discuss about SaaS or Software as a Service, it is the service model that gives quick access to cloud-based web applications. The vendor controls the entire computing stack, which you can access using a web browser. These applications run on the cloud and you can use them by a paid licensed subscription or for free with limited access. SaaS does not require any installations or downloads in your existing computing infrastructure. This eliminates the need for installing applications on each of your computers with the maintenance and support taken over by the vendor. Some known example of SaaS includes Google G Suite, Microsoft Office 365, Dropbox etc. Secondly, we will discuss about PaaS or Platform as a Service, it is basically a virtual provision of computing resources over the cloud. An IaaS cloud provider can give you the entire range of computing infrastructures such as storage, servers, networking hardware alongside maintenance and support. Businesses can opt for computing resources of their requirement without the need to install hardware on their premises. Amazon Web Services, Microsoft Azure, and Google Compute Engine are some of the leading IaaS cloud service providers. And the third service model is Paas or Platform as a Service, it is essentially a cloud base where you can develop, test and organize the different applications for your business. Implementing PaaS simplifies the process of enterprise software development. The virtual runtime environment provided by PaaS gives a favorable space for developing and testing applications. The entire resources offered in the form of servers, storage and networking are manageable either by the company or a platform provider. Google App Engine and AWS Elastic Beanstalk are two typical examples of PaaS. PaaS is also subscription based that gives you flexible pricing options depending on your business requirements.

## 38. CHOOSING BETWEEN CLOUD SERVICE MODELS

Each of them differs and have a range of advantages and disadvantages that may or may not fit in with your business model.

### Benefits of SaaS are given below:

- Affordable – SaaS is affordable as it eliminates the costs involved in the purchase, installation, maintenance and upgrades of computing hardware.
- Anywhere Accessibility – With SaaS, you can access the services from anywhere using any device such as smartphones, which eliminates the constraints set by on-premise software.
- Ready to Use – You can quickly set up SaaS services so that they become functional in no time. All it takes is that you sign up for the service to get access to fast and powerful computing resources.

### Why Should One Opt SaaS?

SaaS has its own disadvantages since it leaves you no control over the hardware allotted to you as only the vendor can manage the software. With SaaS, communication, transferring of content and scheduling meetings are made easy.

SaaS is the ideal choice for small-scale businesses who do not have the necessary budget and resources to deploy on-premise hardware. Besides, companies that require frequent collaboration on their projects will find SaaS platforms useful.

### Benefits of IaaS are given below:

- Minimize Costs – Deploying an IaaS cloud model eliminates the need to deploy on-premise hardware that reduces the costs.
- Enhanced Scalability – As the most flexible cloud computing model, IaaS allows you to scale the computing resources up or down based on demand.
- Simple Deployment – IaaS lets you easily deploy the servers, processing, storage, and networking to make it up and running in no time.

### Why Should One Opt IaaS?

IaaS being the most flexible of cloud models gives the best option when it comes to IT hardware infrastructure. IaaS is the right option if you need control over the hardware infrastructure such as in managing and customizing according to your requirements.

Whether you are running a startup or a large enterprise, IaaS gives access to computing resources without the need to invest in them separately. However, the only downside with IaaS is that it is much costlier than SaaS or PaaS cloud models.

### Benefits of PaaS are given below

- Minimal Development Time – PaaS reduces the development time since the vendor provides all computing resources like server-side components, which simplifies the process and improve the focus of the development team.
- Multiple Programming Language Support – PaaS offers support for multiple programming languages, which a software development company can utilize to build applications for different projects.
- Enhanced Collaboration – With PaaS, your business can benefit from having enhanced collaboration, which will help integrate your team dispersed across various locations.

### Why Should One Opt PaaS?

PaaS is the preferred option if your project involves multiple developers and vendors. With PaaS, it is easy to create customized applications as it leases all the essential computing and networking resources. Being a different model, PaaS simplifies the app development process that minimizes your organizational costs.

Besides, it is flexible and delivers the necessary speed in the process, which will rapidly improve your development times. A typical disadvantage with PaaS is that since it is built on virtualized technology, you will have less control over the data processing. In addition, it is also less flexible compared to the IaaS cloud model.

## 39. DEPLOYMENT MODEL

Deployment models define the type of access to the cloud. Most common deployment models are public, private and hybrid. All these deployment models have their own characteristics and advantages and disadvantages. Based on these characteristics and advantages we can use these deployment models which is suitable for our use case or which matches the requirement of business scenario. We will discuss each deployment model's characteristics, advantages and Disadvantages along with their use cases in detail.

### 4. 1 Public Deployment Model

It is a model in which the service providers make the resources available to the public users over the internet. It is owned by an organization selling cloud services. It may be free or implemented as pay-per-usage policy. Anyone can access the resources according to their demands and scale up/down on its basis. In simple terms, public cloud services are characterized as being available to clients from a third-party service provider via the Internet. The term "public" does not always mean free, even though it can be free or fairly inexpensive to use. A public cloud does not mean that a user's data is publicly visible; public cloud vendors typically provide an access control mechanism for their users. Public clouds provide an elastic, cost effective means to deploy solutions. A public cloud has several benefits. In addition to delivering services over the web, customer has to pay only for the resources they have used like a utility bill. Moreover, since organizations have access to the service provider's cloud infrastructure, they don't have to worry about personally installing and maintaining it. One drawback of a public cloud related to security. Public clouds often cannot meet many security regulatory compliance requirements since different servers reside in multiple countries with various security regulations. Moreover, network issues can occur during peaks in online traffic.

#### Public Deployment Model Use-Case

- **End User to Cloud:** In this scenario, an end user is accessing data or applications in the cloud. Common applications of this type include email hosting and social networking sites. A user of Gmail, Facebook or LinkedIn accesses the application and their data through any browser on any device. The user doesn't want to keep up with anything more than a password; their data is stored and managed in the cloud. Most importantly, the user has no idea how the underlying architecture works. If they can get to the Internet, they can get to their data.
- **Enterprise to Cloud to End User:** In this scenario, an enterprise is using the cloud to deliver data and services to the end user. When the end user interacts with the enterprise, the enterprise accesses the cloud to retrieve data and / or manipulate it, sending the results to the end user. The end user can be someone within the enterprise or an external customer.
- **Enterprise to Cloud to Enterprise:** This use case involves two enterprises using the same cloud. The focus here is hosting resources in the cloud so that applications from the enterprises can interoperate. A supply chain is the most obvious example for this use case.

### 4. 2 Private Deployment Model

It is a model which provides cloud services to a private organization. It may be managed by the organization itself or a third-party organization either on its premises or some other place away from it. Private clouds give the advantage of security to its organization, as all the data is stored on its own private servers, though the organization has to bear the initial set-up expenditure but it's worth the security benefit it provides. The scalability depends on the available resources and is limited unlike the public cloud, where unlimited resources can be utilized and high level of scalability can be achieved. The cloud is implemented within the private premises of an institution and generally made accessible to the members of the institution or a subset of them. The services and infrastructure are always maintained on a private network and the hardware and software are dedicated solely to your organization. In this way, a private cloud can make it easier for an organization to customize its resources to meet specific IT requirements improved security as resources are not shared with others, so higher levels of control and security are possible. Private clouds are often used by government agencies, financial institutions.

## Private Deployment Model Use-Case

- The Private Cloud use case is different from the others in that the cloud is contained within the enterprise. This is useful for larger enterprises. For example, if the payroll department has a surge in workload on the 15th and 30th of each month, they need enough computing power to handle the maximum workload, even though their everyday workload for the rest of the month is much lower. With a private cloud, computing power is spread across the enterprise. The payroll department gets extra cycles when they need it and other departments get extra cycles when they need it. This can deliver significant savings across the enterprise.

## 4. 3 Hybrid Deployment Model

A hybrid cloud is a combination of a public and private cloud that interoperates. In this model users typically outsource non-business critical information and processing to the public cloud, while keeping business-critical services and data in their control. A hybrid cloud is a combination of both public and private cloud. A hybrid cloud model provides multiple options from different service providers. With a hybrid cloud, data and application can move between both a private and public cloud. For example, customers can choose to store data in a private cloud, while running an application in a public cloud. A difficulty with a hybrid cloud is it can be hard to maintain and secure. Additionally, integration can be a challenge since a hybrid cloud is a combination of different clouds, data and applications.

## Hybrid Deployment Model Use-Case

This use case involves multiple clouds working together, including both public and private clouds. A hybrid cloud can be delivered by a federated cloud provider that combines its own resources with those of other providers. A broker can also deliver a hybrid cloud; the difference is that a broker does not have any cloud resources of its own. The provider of the hybrid cloud must manage cloud resources based on the consumer's terms.

## 40. CONCLUSION

In this review paper, we have discussed about private, public and hybrid cloud deployment model in-dept., along with their use-cases. As we have described characteristics, advantages and disadvantages of each deployment model in detail. After reading this review paper, learner can decide which cloud deployment model to use in which business scenarios or business Use-cases.

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## Awareness on 21<sup>st</sup> Century Skills among Twelfth Standard Students: A Survey Study

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### ABSTRACT

*To survive and succeed in this rapidly changing world the learners of today need certain abilities and skills. These complex 21<sup>st</sup> century skills are the need of the hour for learners of today. The main objectives of the study were i) to identify the level of awareness of rural government school students of twelfth standard on 21<sup>st</sup> century skills ii) to study whether there is any significant difference in the awareness of 21<sup>st</sup> century skills between rural government school boys and girls of twelfth standard in relation to broader areas of learning skills, literacy skills and life skills iii) to study whether there is any significant differences between learning skills and literacy skills, literacy skills and life skills and learning skills among the rural government school boys and girls of twelfth standard iv) to find out the difference between rural government school students of mathematics group and arts group on 21<sup>st</sup> century skills. The investigator adopted normative survey method. The sample consisted of 36 rural government school students of twelfth standard. The investigator administrated self-constructed tool with 45 items covering the broader areas) learning skills ii) literacy skills and iii) life skills. The findings showed that) there is no significant difference between boys and girls in the awareness on 21<sup>st</sup> century skills ii) there is significant difference among the boys and among the girls in their awareness on 21<sup>st</sup> century skills in relation to a) learning skills and literacy skills b) literacy skills and life skills c) life skills and learning skills. iii) there is no significant difference between the students of twelfth standard belonging to mathematics group and arts group in their awareness on 21<sup>st</sup> century skills. The investigator has given recommendation to the teachers, learners and parents to develop awareness on 21<sup>st</sup> century skills.*

**Keywords:** Learning skills, literacy skills, communication, collaboration, creativity, critical thinking and life skills.

### INTRODUCTION

Imagine a class where the learners are always passive and simply sitting while teachers are lecturing continuously. Majority of learners rely on text books and follow the instructions given by teachers. Generally, in a class room our teachers teach, give assignments, tests and correct papers in a stereo typed manner. So far, the schools focus on scoring marks and high grades only. It is time to restructure schools to focus and concentrate on developing skills besides academic excellence.

Today's modern learner knows only through education the future can be exposed and with that only he can cross the door and enter into future. Generally, most people will stop their education after getting a degree or after entering into a job. But in reality, learning is a life time endeavor.

Today's modern learner aspires for challenges and experiences from various levels. His expectation is high as he is an energetic, exploring and tech-savvy person. He has to develop certain skills to enter into the rapidly changing world. The tasks of teacher become complicated as they have to teach and inspire the modern learners and the teachers have to be aware of needs and expectations of their learners. Modern learners need skills that are crucial for deep and effective learning then only the younger generation can cope up with the present and the future world.

The following are some of the twenty first century skills needed by today's learners. The main skills can be broadly classified into learning skills, literacy skills and life skills. The learning skills include critical thinking, creativity, collaboration and communication. Literacy skills include information literacy, media literacy and technology literacy which can be called IMT skills. The life skills include flexibility, leadership, productivity and social skills. Today's modern learners have to think critically about unknown things happening around him. He has to work in collaboration with his peers. He has to communicate and deliver his ideas clearly. He has to

be familiar with digital tools, QR code, using apps. Hence, the students need a set of abilities and skills to get success both in career as well as future studies in this information age.

## OBJECTIVES

Following are the objectives of the study:

- To identify the level of awareness of rural government school students of twelfth standard on 21<sup>st</sup> century skills.
- To study whether there is any significant difference in the awareness of 21<sup>st</sup> century skills between rural government school boys and girls of twelfth standard in relation to broader areas of learning skills, literacy skills and life skills.
- To study whether there are any significant differences between learning skills and literacy skills, literacy skills and life skills and learning skills and life skills among the rural government school boys and girls of twelfth standard.
- To find out the difference between rural government school students of mathematics group and arts group on 21<sup>st</sup> century skills.

## HYPOTHESES

- There will not be any significant difference between the rural government school boys and girls of twelfth standard in their awareness on 21<sup>st</sup> century skills.
- There will not be any significant difference between the rural government school boys and girls of twelfth standard in their awareness on 21<sup>st</sup> century in relation to learning skill, literacy skills and life skills.
- There will not be any significant difference between the rural government school students of twelfth standard mathematics group and students of twelfth standard arts group in their awareness on 21<sup>st</sup> century skills.

## METHODOLOGY

In the present study normative survey method was employed.

## SAMPLE FOR THE STUDY

36<sup>th</sup> twelfth standard students studying in rural government higher secondary school, Anthakudi, Kilvelur block, Nagapattinam District, Tamil Nadu.

The students of twelfth standard are in adolescent stage and they have to enter into college studies after completing schooling. In this transition period the students of twelfth standard must inculcate their goal for their future. They have to develop various skills to cope up with the modern techno world. That is why the researcher selected the students of twelfth standard for this study.

## TOOL

1. Personal information sheet.
2. A questionnaire developed by the researcher to assess the awareness on 21<sup>st</sup> century skills in relation to learning skills, literacy skills, life skills.

## STATISTICAL TECHNIQUES USED

Mean, Standard deviation, t-test.

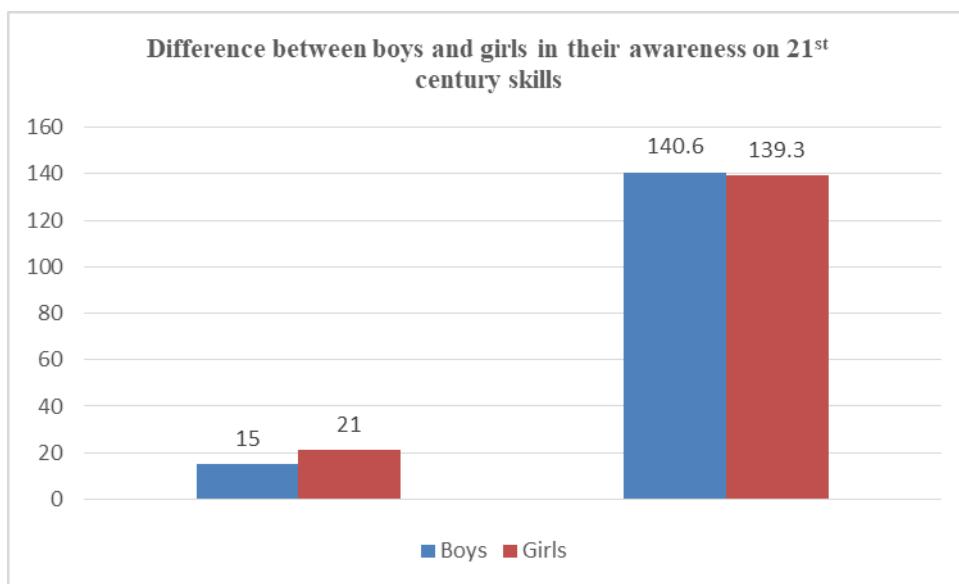
## Procedure

The researcher administered the questionnaire containing 45 items to rural government school students of twelfth standard boys and girls to find out the awareness on 21<sup>st</sup> century skills. The completed questionnaires were collected and scoring was done. The scores were tabulated and analyzed using appropriate statistical techniques.

**Table 1: Difference between boys and girls in their awareness on 21<sup>st</sup> century skills**

Sample	N	Mean	SD	't' value
Boys	15	140.6	10.575	
Girls	21	139.3	8.037	0.4007

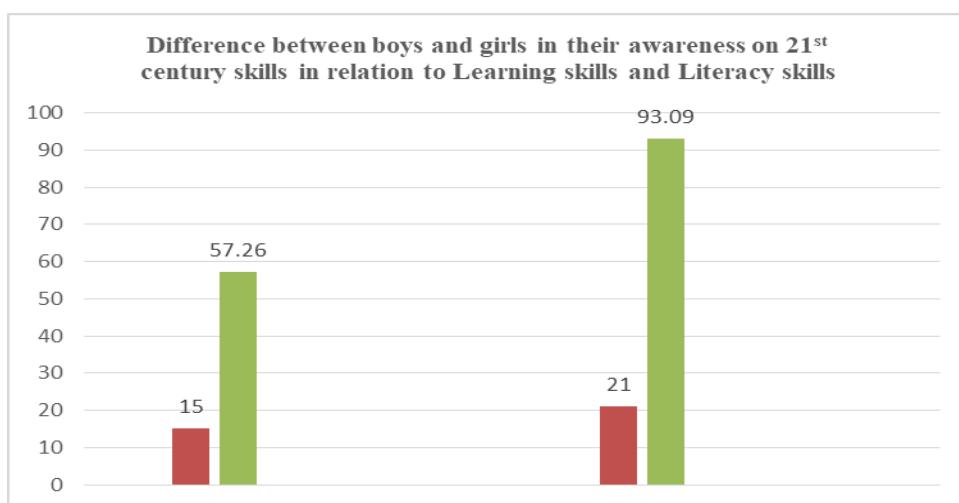
From the above table it is known that the calculated 't' value is 0.4007 and it is significant and hence it is inferred that there is no significant difference between the rural government school boys and girls of twelfth standard in their awareness on 21<sup>st</sup> century skills.



**Table 2: Difference between boys and girls in their awareness on 21<sup>st</sup> century skills in relation to Learning skills and Literacy skills.**

Sample	Name of the skills.	N	Mean	SD	't' value
Boys	Learning skills	15	57.26	4.864	
Girls	Learning skills	21	93.09	5.98	0.046

From the above table the calculated 't' value is 0.046 and it is not significant and hence it is inferred that there is no significant difference between the rural government school boys and girls of twelfth standard in their awareness on 21<sup>st</sup> century skills in relation to learning skills.



**Table 3: Difference between awareness on learning skills and literacy skills among the boys and among the girls.**

Sample	Name of the skills.	N	Mean	SD	't' value
Boys	Learning skills	15	57.26	4.864	13.830
	Literacy skills	15	36.86	3.008	
Girls	Learning skills	21	57.19	3.736	19.507
	Literacy skills	21	35.90	3.503	

From the above table the calculated 't' value of boys is 13.830 and it is significant. The calculated 't' value of girls is 19.507 and it is significant. Hence it is inferred that there is significant difference between learning skills and literacy skills among the rural government school boys and girls of twelfth standard in relation to learning skills and literacy skills.

**Table 4: Difference between boys and girls in their awareness on 21<sup>st</sup> century skills in relation to Literacy skills and Life skills.**

Sample	Name of the skills	N	Mean	SD	't' value
Boys	Literacy skills	15	83.33	6.739	0.439
	Life skills				
Girls	Literacy skills	21	82.14	5.329	
	Life skills				

From the above table the calculated 't' value is 0.439 and it is not significant and hence it is inferred that there is no significant difference between the rural government school boys and girls in their awareness on 21<sup>st</sup> century skills in relation to literacy skills and life skills.

**Table 5: Difference between the awareness on Learning skills and Life skills among the boys and among the girls.**

Sample	Name of the skills	N	Mean	SD	't' value
Boys	Learning skills	15	57.26	4.864	6.192
	Life skills	15	46.46	4.688	
Girls	Learning skills	21	57.19	3.736	9.432
	Life skills	21	46.23	3.803	

From the above table the calculated 't' value of boys is 6.192 and it is significant. The calculated 't' value of girls is 9.432 and it is significant. Hence it is inferred that there is a significant difference between learning skills and life skills among the boys and among the girls.

**Table 6: Difference between rural government school students of mathematics group and arts group in their awareness on 21<sup>st</sup> century skills.**

Name of the group	N	Mean	SD	't' value
Mathematics group	19	139.84	9.77	0.013
Arts group	17	139.88	8.51	

From the above table the calculated 't' value is 0.013 and it is not significant and hence it is inferred that there is no significant difference between rural government school students of mathematics group and arts group in their awareness on 21<sup>st</sup> century skills

## FINDINGS

Following are the findings of the study:

- There is a no significant difference between the government school boys and girls of twelfth standard in their awareness on 21<sup>st</sup> century skills.
- It is really an interesting observation that there is no significant difference between learning skills and literacy skills among the government school boys and girls of twelfth standard in the awareness on 21<sup>st</sup> century skills.

- There is no significant difference between the rural government school boys and girls of twelfth standard in their awareness on 21<sup>st</sup> century skills in relation to literacy skills and life skills.
- Another interesting observation there is a significant difference among the rural government school boys and among the girls of twelfth standard in their awareness on 21<sup>st</sup> century skills in relation to literacy skills and life skills.
- There is no significant difference between the rural government school twelfth standard boys and girls in their awareness on 21<sup>st</sup> century skills in relation to learning skills and life skills.
- Another interesting observation there is a significant difference among the rural government school boys and among the girls of twelfth standard in their awareness on 21<sup>st</sup> century skills in relation to life skills and learning skills.
- There is no significant difference between rural government school students of mathematics group and arts group on 21<sup>st</sup> century skills.

## DISCUSSION

From the above findings it is clear that the rural government school twelfth standard boys and girls do not differ in their awareness on 21<sup>st</sup> century skills. This may be due to the fact that today's learners get wide exposure from various sources. When the researcher compared learning skill vs. literacy skills, literacy skills vs. life skills, life skills vs. learning skills among the boys and among the girls observed significant difference between the skills.

The researcher compared the rural government school boys and girls of twelfth standard from mathematics group and arts group and observed that there is no significant difference in their awareness on 21<sup>st</sup> century skills. This may be due to the implementation of technology used in the class room as well as the exposure the students get from the society. The teachers who belong to 20<sup>th</sup> century have to develop their skills to inculcate the skills on 21<sup>st</sup> century today's modern learners.

The learners have to be trained by the teachers to expertise in various skills. The teacher has to plan properly to develop skills to read, write, to do projects and to do presentations. The teacher has to guide in the following.

- **Read:** Select books, journals, e-books, blogs, biographies.
- **Write:** content, style of writing, clarity in writing, writing in a presentable way.
- **Do project:** Planning projects which will be the need of the society, selecting current topics, where to get the idea and references.
- **Do presentation:** Preparation of power point, info-graph and how to do in an effective way.
- **Communication:** Learn to communicate with multiple multimedia formats.

The learners have to develop their standard to the national level and have to attain mastery in academics subjects as well as current affairs. The learners must learn the ability to solve complex problems they face in life. The learners must think and work creatively in both digital and non-digital environments so that they can develop unique and profitable solutions.

The parents have a great role in the development of exposing their children to acquire knowledge, awareness and exposure through today's technology. They have to train their children to proper and safe usage of internet when they retrieve information from various sources. One fine day the parents can observe their children blossoming into today's modern learner.

## CONCLUSION

The present study was conducted to find out the awareness on rural government school twelfth standard boys and girls on 21<sup>st</sup> century skills. It was found that though the students are from rural background they have awareness in certain skills. It is the duty of the teachers, parents, schools and stake holders to help the students to develop all the skills effectively. No doubt even the rural students can become an efficient learner filled with 21<sup>st</sup> century skills.

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## Improvement of Learning Outcomes through Smart Virtual Classroom among Diploma in Elementary Education Students

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### ABSTRACT

*A Smart virtual classroom is an online learning environment that contains all course materials of education. The conception of the smart virtual class room has made it possible for students to tackle the features of the internet to create meaningful and constructivist learning environment of School education. Information and Communication Technology (ICT) is playing vital role in teaching learning process of smart virtual class room. It increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. At the same time the students get knowledge or skills from some programs and assignment in the concept of learning outcomes.*

*Keywords:* Learning outcomes and smart virtual classroom.

### INTRODUCTION

Technology plays a vital role in every sphere of life and education is no exception. The advent of technology has deeply impacted the educational scenario of the world. Technology has certainly changed the way we live. It has impacted the different facets of life and redefined living. In the present era, the development in various aspects of computer technology has reached beyond our imagination and expectations. As computer becomes part and parcel of our life, knowledge of computers is very much needed for everyone. Information and Communication Technology (ICT) is playing a vital role in teaching and learning to meet the needs and anticipation of the learners' in large scale.

The main purpose of ICT in education means implementing of ICT equipment and tools in teaching and learning process as a media and methodology. The purpose of ICT in education is generally to make students familiar with the use and workings of computers, and related social and ethical issues. Due to miscellaneous requirements in teaching and learning for a Smart board, there are opportunities and challenges that are to be addressed in usage of the technology and the service(s) being provided through ICT.

### REVIEW OF RELATED STUDIES

**Anurag Chaudhary (2014)** This paper is about the much growing technology "SMART CLASS and E-LEARNING". The usage of smart teaching techniques is now more prevalent in school as well as other colleges and institutes. It was generated back in 1980s and is growing since then. This new technology helps the students with the benefit of learning with a different experience. The methods of e-learning make the classroom more interactive and interesting. It has also created a greater impact on our society as well as on education system. The government has also started implementing this idea of e-learning in the schools. There are several examples available in the market that encourage the idea and work for its betterment. The smart classes have their own merits and demerits but this new technology is welcomed by the society in a great manner.

**Mehedi Masud (2016)** The large number of reasonably priced computers, Internet broadband connectivity and rich education content has created a global phenomenon by which information and communication technology (ICT) has used to remodel education. E-learning can be explained as the use of available information, computational and communication technologies to assist learning practice. In the modern world, education has become more universal, and people are looking for learning with simplicity and interest. Students are looking for more interactive and attractive learning style rather than old traditional style. Using technological learning, we can enhance the education system. We can deliver quality education to students as well as we can ease and uniform the process of education by using the modern technologies and methods.

**Sivakumar (2018)** A Smart virtual classroom is an online learning environment that contains all course materials of education. The conception of the smart virtual class room has made it possible for students to tackle the features of the internet to create meaningful and constructivist learning environment of School education. Information and Communication Technology (ICT) is playing vital role in teaching learning process of smart virtual class room. It increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. At the same time the students get knowledge or skills from some programs and assignment in the concept of learning outcomes.

## STATEMENT OF THE PROBLEM

The problem of the study is stated as, "Improvement of learning outcomes through smart virtual classroom among teacher training students."

## DEFINITIONS OF TERMS USED IN THE STUDY

### Learning outcomes

Learning outcomes are statements that specify what a learner will know or be able to do as a result of a learning activity. Outcomes are usually expressed as knowledge, skills, or attitudes.

### Smart virtual class rooms

A smart virtual classroom is a teaching and learning environment where participants can interact, communicate, view and discuss presentations, and engage with learning resources while working in groups, all in an online setting.

### Significance of the study

Education is the driving force of economic and social development in any country. Hence, it is necessary to find ways to make education of good quality, accessible and affordable to all, using the latest technology available. From last two decades ICT has been used and its usage has caused a revolutionary change in the development of society. Computer mediated learning is being carried out by student teacher's in teacher education for their competency and other general activities. Every human being lives in the web and social world. It provides lot of facilities for the teacher educations, particularly smart virtual classroom learning. It helps with new platforms come new forums for training students to discuss, video conferencing, etc., It becomes highly attractive tool in our teacher education program to develop teaching competency. In earlier studies, it is indicated that introducing computer aided learning used to great extent by teacher training students. Hence, it is concluded that the smart virtual learning of the study is focused on improvement of learning outcomes through smart virtual classroom among teacher training students of Nagapattinam district.

## OBJECTIVES OF THE STUDY

To find out improvement of learning outcomes through smart virtual classrooms among teacher training students in terms of

- a. First year and second year teacher training students
- b. Teacher training Students with urban and rural background
- c. Computer science and non-computer science group teacher training students.

## HYPOTHESES OF THE STUDY

- a. There is no significant difference in improvement of learning outcomes between first year and second year teacher training students.
- b. There is no significant difference in an improvement of learning outcomes between urban and rural teacher training students.
- c. There is no significant difference in an improvement of learning outcomes between computer science and non-computer science group teacher training students.

## METHODOLOGY

In order to achieve the objectives of the present investigation, survey method was employed. The methodological detail like sample, tool, and procedure of data collection, scoring procedure and statistical techniques are given below.

## Sample

Survey method was used for the present study. A sample of 42 D.El.Ed ( Diploma in Elementary Education) students was selected through purposive sampling technique from District Institute of Education and Training (DIET), Kurukkathi, Nagappattinam District.

## TOOLS USED FOR THE STUDY

The level of learning outcomes to the sample was determined based on the examination marks in the term exam. The term exam conducted as per the prescribed norms of government on the basis of Tamil Nadu Teacher Eligibility Test. The percentage of total marks of 42 students was taken for the research purpose.

## DATA COLLECTION

In order to assess the improvement of learning outcome through smart virtual class room among teacher training students, the tool was distributed to them and administered faithfully in strict accordance with the directions provided.

## Statistical techniques used

In order to analyses and interpret data, the following statistical techniques- Mean, Standard deviation and t-test.

## Delimitation

The following are the delimitation of the study

- The present study has selected Government teacher training students of District Institute of Education and Training, Nagapattinam District only.
- For this study the investigator collected data from 42 first year and second year teacher training students only.

## ANALYSIS AND INTERPRETATION OF DATA

For analysis and interpretations of data, the relevant input and analytical finding and inferences derived have been presented in different tables and their discussion provided after the table;

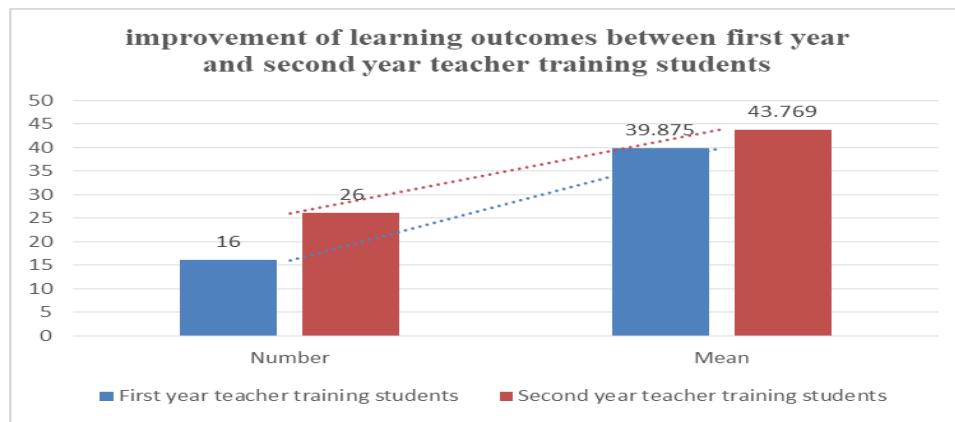
## Hypothesis - 1

**There is no significant difference in improvement of learning outcomes between first year and second year teacher training students.**

Table: 1

Variables	No	Mean	S. D	't' Value	Significant Level
First year students	16	39.875	6.936	2.137	Significant
Second year students	26	43.769	2.888		

From the above table, it is observed that the 't' value with respect to learning outcomes is (2.137) is significant at 0.01 level, indicating that the second-year teacher training students have higher level of improvement in learning outcomes through smart virtual class room. Hence the null hypothesis that "there is no significant difference in improvement of learning outcomes between first year and second year teacher training students" is rejected.



## Hypothesis - 2

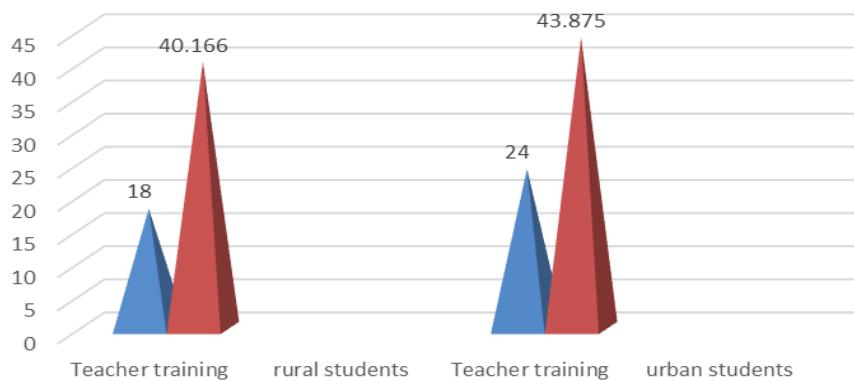
**There is no significant difference in an improvement of learning outcomes between urban and rural teacher training students.**

**Table: 2**

Variables	No	Mean	S. D	't' Value	Significant level
Rural students	18	40.166	6.626	2.22	Significant
Urban students	24	43.875	2.893		

From the above table, it is observed that the 't' value with respect to learning outcomes is (2.22) is significant at 0.01 level, indicating that the urban teacher training students have higher level of improvement in learning outcomes through smart virtual class room. Hence the null hypothesis that "there is no significant difference in improvement of learning outcomes between rural and urban teacher training students" is rejected.

**improvement of learning outcomes between urban and rural teacher training students.**



**Hypothesis - 3**

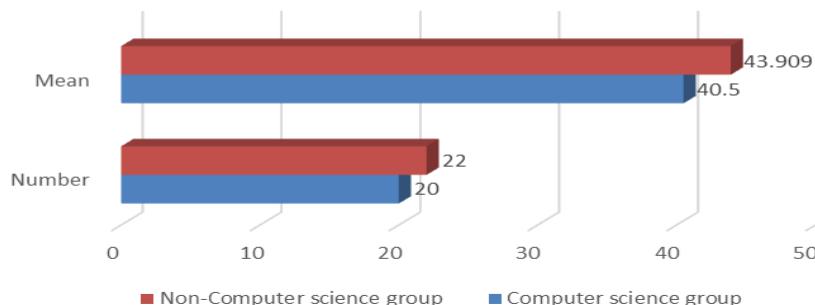
**There is no significant difference in an improvement of learning outcomes between computer science and non-computer science group teacher training students.**

**Table: 3**

Variables	No	Mean	S. D	't' Value	Significant Level
Computer science group	20	40.5	6.3037	2.1877	Significant
Non-Computer science group	22	43.909	3.1154		

From the above table, it is observed that the 't' value with respect to learning outcomes is (2.1877) is significant at 0.01 level, indicating that the computer science group teacher training students have higher level of improvement in learning outcomes through smart virtual class room. Hence the null hypothesis that "There is no significant difference in an improvement of learning outcomes between computer science and non-computer science group teacher training students" is rejected.

**improvement of learning outcomes between computer science and non-computer science group teacher training students.**



## FINDINGS

- The implementation of smart virtual class room for teacher training students before and after differ significantly in terms of improvement of learning outcomes through smart virtual class room.
- The first year and second year teacher training students differ significantly in terms of improvement of learning outcomes through smart virtual class room.
- The urban and rural teacher training students differ significantly in terms of improvement of learning outcomes through smart virtual class room.
- The computer group and non-computer group teacher training students differ significantly in terms of improvement of learning outcomes through smart virtual class room.

## IMPLICATIONS OF THE STUDY

The following are the educational implications of the study

- These findings of the study will be of immense use of understanding the improvement of learning outcomes of teacher training students by using smart virtual classroom.
- This study proved that improvement of learning outcomes by using smart virtual class room among teacher training students.
- Thus, this study strongly evinced the importance of technology aided learning environment in the teaching learning process of teacher education.

## AREAS FOR FURTHER RESEARCH

Some of the areas for research in the future may be as follows.

- The present study was confined to the District Institute of Education and training only. This study can be done in various types teacher education departments like B.Ed. college, Universities etc.
- This work can be done in comparative study of different colleges, universities, districts etc.

## CONCLUSION

It is fact that smart virtual class rooms, i.e., Information and Communication Technology is playing a vital role in improvement of learning outcomes to teacher education platform. Smart virtual class room is designed to help faculties and teacher trainees to compete with new challenges and developing teaching competency and performance. It provides improved way of education in which teachers teach and students learn in colleges or universities with advanced and significant use of technology. They can interact directly without any hesitations. Smart class has many benefits to the students and faculties. It is very clear that innovation in technology is impacting everywhere and bringing new opportunities for schools, universities and educationalists. We can help students, student teacher as well educators by using advanced technologies to make the future bright. In this paper reveals that the teacher training students have better improvement of learning outcomes by using smart virtual class room.

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## Virtual Campus

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### ABSTRACT

*Virtual Campus is a computer-generated experience taking place within a simulated environment. It incorporates mainly auditory and visual feedback sensors. This virtual environment can be like the real world or fantastical. This paper is about providing a virtual walkthrough of the campus using virtual reality. Virtual Campus refers to a center that provides information that allows students to access the college campus virtually. This involves building a virtual tour of the college for the students by combining all kinds of digital campus resources. We present a three-dimensional model to the users of our system. With the help of Unity 3d and Blender, we can create a three-dimensional view of the campus. Virtual Campus will be majorly useful for physically handicapped persons. Our goal is to provide a virtual campus tour for physically disabled people.*

*Keywords: Virtual campus, Unity 3d, Blender, physically disabled, virtual reality.*

### 1. INTRODUCTION

Virtual Reality (VR) technology is an advanced human-computer interface. VR (Virtual Reality) technology is a very active research field of the IT industry in recent years. It is a collection of a series of high and new technology, including computer graphics, image processing, pattern recognition, intelligent interface technology, artificial intelligence, multi-sensor technology, and highly parallel real-time computer technology. Conception mainly emphasizes the imaginable space of virtual reality technology. It can widen the human knowledge range, not only reproducing the virtual environment but freely conceiving the environment which did not exist or is impossible. Virtual Campus is a relatively large-scale three-dimensional scene. It shows the view of the college through the desktop system. Taking into account the difficulty of large-scale scene modeling is relatively high, each object of the campus is modeled respectively, and then each model is inlined to the interface of the main background with sky and ground, which form the whole campus scene. In the process of developing a virtual campus, the most important task is modeling, including various types of buildings and landscapes.

### 2. OBJECTIVE

To provide the advantage of virtual roaming. It gives users a professional feel and looks. Display correct information about the direction in which the user goes. Provide a collaborative virtual reality environment for virtual tours. Alternative to traditional real Life tours for a college campus.

#### 2.1 Motivation

Allows taking virtual risks and gaining real-world experience. Potential entertainment value Example: Immersive films, video games. Engagement and great potential in e-Learning. Extension of Web into 3 dimensions. Examples embedded object models, camera animation "Learning –as constructing knowledge.

#### 2.2 Advantages

An important application of virtual campus walkthrough technology is that Virtual campus supports resource management, environmental planning, and school development informatization. Unity 3d can adapt to the current network environment.

It helps the disabled person to access or explore the college without moving by staying at a single place by accessing the website of the campus. With the help of this paper, a user can explore the campus to get a better knowledge of the campus. This paper promotes the development of distance education. Good platform for digital campus construction. Enhance visibility. Strengthen interactivity. Active participation mode from passive acceptance mode.

### 3. REQUIREMENTS

This paper used the way of the virtual characters walking during the virtual objects to make visitors understand the specific image of the object. This provides a unique way to introduce a campus. We used the campus images of actual landscapes in the program. These scenes include roads, buildings, college gates, flowers, plants, trees, and other buildings. And it has a certain ability to interact, for example, visitors can go to any

location of the map and click the button to know about the location. To the general public who want to be a part of the college, it can attract plenty of attention. The walkthrough has a day and night cycle so the user will be able to explore the campus any time of the day. The feature of rainfall provides a realistic feel to the user we have presented three ways for controlling crowd behaviour. First by defining rules for computer-simulated agents, second by providing controls to the users as human-controlled agents to navigate in the VR campus environment as autonomous agents, and the third by providing controls to the users with a keyboard. The user can find the distance between his/her current location and the place that he/she would like to visit the campus.

**Validation:** Validating the platform-independent format before inserting it into the centralized repository (database)

**Modifiability:** Requirements about the effort required to make changes in the software. Often, the measurement is a personal effect.

**Security:** One or more requirements about the protection of our system and its data. The measurement can be expressed in a variety of ways (effort, skill level, time) to break into the system.

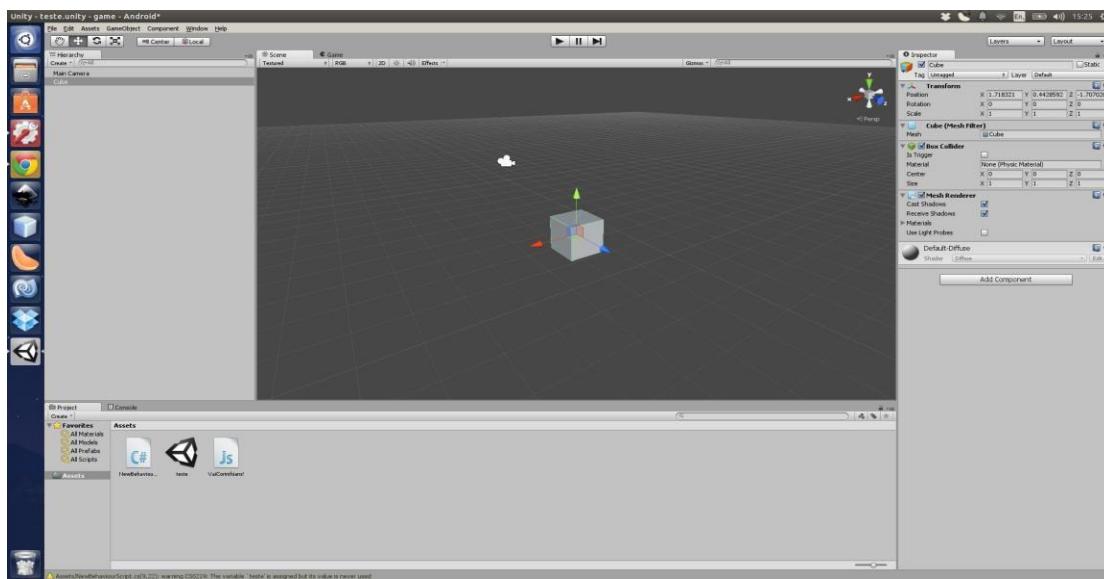
**Platform Constraints:** Discuss the target platform. Be as specific or general as the user requires. If the user doesn't care, there are still platform constraints.

**Usability:** About how difficult it will be to learn and operate the system. The requirements are often expressed in learning time or similar metrics.

## 4. TOOLS AND TECHNOLOGY

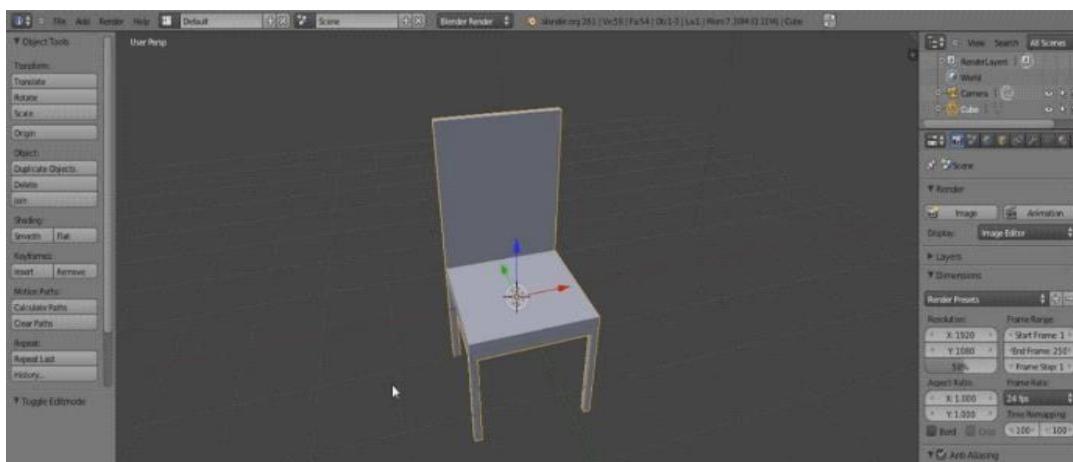
### Unity 3D:

In Unity 3D we can create any 2D or 3D game. We can make it with ease, we can make it highly-optimized and beautiful, and we can deploy it with a click to more platforms than we have fingers and toes. What's more, we can use Unity's integrated services to speed up our development process, optimize our game, connect with an audience, and achieve success. There are so many platforms we can deploy to with the Unity game engine, and their number is growing all the time. Build our content once and deploy at a click across all major mobile, VR, desktop, console, and TV platforms plus the Web.[2] In an implementation, we have used the models that were prepared in Cinema 4D and Blender are combined in Unity 3D and we have created a third party viewer's view.



### Blender

Blender is a professional free and open-source 3D computer graphics software used for animation, visual effects, art, 3D printed models, interactive 3D applications and video games. Blender's features include 3D modeling, UV unwrapping, texturing, raster graphics editing, rigging and skinning, fluid and smoke simulation, particle simulation, soft body simulation, sculpting, animating, match moving, camera tracking, rendering, video editing, and compositing. It further features an integrated game engine.[3] In an implementation, we have modeled a chair for the classroom.



## 5. CONCLUSION

The paper consists of the work process and technology like Blender, Unity 3D and Cinema 4d which is used for 3D modelling and construction. With the help of this, people with physical disabilities or cognitive disabilities can explore the campus by sitting at one place. In the future, we can add more features to our project concerning security and can be uploaded on any college/school website that wants their users to have a look at their campus virtually. Hence we were able to explore various tools that can be used to make a user walkthrough a virtual environment.

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## Implementation of Janani Suraksha Yojana Using Digitized Smart System

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### ABSTRACT

*Janani Suraksha Yojana (JSY) is a scheme implemented by the central government of India with an objective of reducing maternal and infant mortality rate by providing or promoting institutional deliveries among all poor women of rural areas. It also provides cash and medicine assistance during pre-delivery and post-delivery at least for 6 months. The aim of the proposed idea is to create smart system that will help primary health care centres and ASHA workers to track maximum number of pregnant women of rural areas, guide them through technology and avail the services offered by the government. Primary health care centres can have devices connected wherein the medication, doctors visit, daily routine food guidance can be shown in form of videos which will create awareness. Direct Benefit Cash Transfer (DBT) under JSY is effective since 2013 wherein all pregnant women are entitled to get the cash directly into their account. This system will give all information in one place for the doctors, patients, and health care workers and also government officials. Its objective is to reduce the MMR and IMR by digitizing the work of health care centres and enabling them to monitor the pregnancies of the women in all unprivileged area.*

**Keywords:** Pregnant Women, Maternal and Infant Mortality Rate, Institutional Delivery, Technology in health care centers, Rural area.

### 41. INTRODUCTION

Janani Suraksha Yojana was launched in April 2005 by modifying the National Maternity Benefit Schemes (NMBS). It is one of the national health programmes (NHP) under the National Rural Health Mission (NRHM) by the government of India under sponsored scheme. It has been implemented with an objective of reducing maternal and infant mortality rate by promoting institutional deliveries amongst pregnant women. Under this programme all eligible pregnant women are entitled for cash and medicine assistance at least for a minimum period of six months of post-delivery irrespective of the age of mother and the number of children for giving birth in a government or private health facility centres.

The programme is categorized under –Low Performing States (LPS) and High Performing States(HPS) in all states and union territories. States having institutional deliveries less than 25% is under LPD and states having institutional deliveries more than 25% is under HPS. This scheme also provides incentives to the women volunteers/workers based on their performance under the scheme called as Accredited Social Health Activist (ASHA). ASHA is a community of health workers under government of India –Ministry of Health and Family Welfare (MoHFW) All poor and entitled women will get the benefit of direct cash transfer into their account. The main objective of this scheme is to minimize or completely decline the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR).

Government has made is mandatory that at least two doses of Tetanus injection should be given during the pregnancy phase. Maternal Mortality Rate is defined as the number of female deaths per 100,000 live birth due to complication from pregnancy or childbirth.

### 42. LITERATURE REVIEW

It is a centrally sponsored scheme which provides cash assistance with delivery and post-delivery care. The eligibility of cash assistance is: LPS- All pregnant women delivering in government hospitals, primary health care centres, and general ward of district/state hospitals. HPS- All below poverty line (BPL) /SC/ST women falling in this category is also eligible. Cash assistance for institutional deliveries in Rs.

Category	Rural Area		Total Amount	Urban Area		Total Amount
	Mother's Package	ASHA's Package		Mother's Package	ASHA's Package	
LPS	1400	600	2000	1000	400	1400
HPS	700	600	1300	600	400	1000

According to World Health Organization (WHO), pregnant women must ensure that she completes four antenatal visits to a health care centres for the safe, healthy pregnancy and delivery of an infant.

The maternal mortality rate (MMR) , according to the sample registration system (SRS) data released by the office of Registrar General of India on Wednesday declined to 130 in 2014-16 from 167 in 2011-13.<sup>[1]</sup>

ASHA is an interface between the health care centres and the pregnant women with a vision to bring down the MMR and IFR by continuous monitoring and regular check-ups, follow up ensuring them to take minimum of two TT injection, healthy diet, prescribed medicines and encouraging them to give births in health care centres in a hygienic environment.

ASHA workers are volunteers, they receive outcome based remuneration and financial compensation for training the expected women. They receive Rs.600 for each institutional delivery and Rs.150 to complete the immunization of a child and also Rs. 150 for each individual who undergoes family planning after the awareness by the ASHA workers.<sup>[2]</sup>

#### 43. OBJECTIVE

- Smart Monitoring System aims are to keep track of the schedule and status of the registered pregnant women, ANC visits, and Tetanus injection doses.
- The proposed system will also monitor the workers by letting them know the estimated date of delivery which will ensure them to have deliveries in the authorized health care centers only under the doctor guidance more efficiently and effectively, instead of the home delivery where the risk of getting infected is more that results in maternal death.
- This System will also involve the post-natal care of the mother, the immunization of the infant at least one year from its birth.
- Visit the house of drop-outs and left-outs from immunization of the child and update the system.

#### 44. PROPOSED SYSTEM

##### 4.1 Registration Process

It involves the registration of the expected women when she visits the health care centres for her first Anti-natal care during the first trimester. The registration fields are – First name, Middle name, Last name, Aadhar No, Date of last menstrual period, based on last menstrual date the expected or due date of delivery will be generated and notified accordingly.

Once the women are registered the system will automatically calculate the date of next visit, the tetanus injection date etc. moreover it will also send reminder messages in Hindi to these registered pregnant women about their next visit to the health care centres. The schedule of four anti-natal visits by the government of India.

No. of Visits	Weeks
1	1 <sup>st</sup> to 12 <sup>th</sup>
2	14 <sup>th</sup> to 26 <sup>th</sup>
3	28 <sup>th</sup> to 34 <sup>th</sup>
4	36 onwards

Table 1: Schedule

##### 4.2 ADMINISTRATOR

The governing body or authority can be considered as the administrator from the health care centre for the proposed system. Admin task is to fill the details of the expected women carefully, keep records and track them on daily basis.

## 4.3 DOCTORS CHECK UP

Once the check-up is done by the doctor, the file would be given to the administrator of the health care centre mostly, the ASHA workers and they will make all entries related to the prescribed medicines etc.

## 45. CONCLUSION

### 5.1 Advantages

- Digitization, there is a need of digitization in every human task which will monitor automatically the improvement in the health of expected women.
- Monitoring of anti-natal care visits can be tracked.
- Monitoring of post-natal care such as mother's health, baby's vaccinations/immunizations.
- Automatic generation of expected delivery dates and sending messages to them to get admitted.
- Increases the deliveries at the health care centers in presence of doctors and ASHA workers rather at home.

### 5.2 Disadvantages

- Network connectivity would be very difficult.
- Making the expected women aware about the facility given by the health care centres and making them understand that delivery at hospitals are safe than at home.

## 46. CONCLUSION

This proposed system will ensure to reduce the maternal mortality rate by making the expected women of unprivileged area, aware about the health care centres at nearby location, providing the follow-up by the ASHA workers, sending them personalized messages and informing them about their regular follow-ups and also the care given after the delivery with at least one-year immunization coverage and all. The mothers will also be given cash incentives that will be directly transferred into their account.

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## Role of Telemedicine in Maharashtra under National Rural Health Mission

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### ABSTRACT

*With the introduction of modern information and communication technologies (ICTs), telemedicine is now transferring health care delivery from hospitals and clinics into homes, both nationally and globally. Telemedicine in India is playing a vital role especially in remote areas. It's a novel initiative taken by the Government of India in order to reach out to the under privileged and vulnerable section of the society especially women and children by improving access, availability and quality of public health services. The technology involved in telemedicine allows providers and patients to be almost anywhere, this is one of the key factors in providing quality healthcare to the needy. It allows the patient to consult the doctor online through mobile phones, internet or making it available through video conferencing. National Rural Health Mission (NRHM) is the initiative taken in different states of India with an objective to provide effective healthcare to rural population.*

*Index Terms – Telemedicine, Healthcare, NRHM, ICT in healthcare, Rural healthcare.*

### HISTORY

According to WHO, health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The health status is usually measured in terms of life expectancy at birth, infant mortality rate, fertility rate, crude birth rate and crude death rate. Maharashtra is considered to be one of the developed states of India with a population of over 11.24 crores. And out of total population, 45.22% people live in urban regions.

An important indicator of health status is Doctors serving per '000 of population. An increase in its growth rate signifies better position of health services. Though, the ideal Doctor-Patient ratio is considered as 1:1000, India is having 0.62:1000 as the ratio. However, in absolute terms there is still a large gap in health status of Maharashtra as compared to some other States. There are considerable variations across districts, necessitating setting up of district specific targets. This Mission has provided the opportunity to address these issues. As per the order from Government of India, State Health Mission has been constituted under the chairmanship of the Hon. Chief Minister in the year 2005.

On the other side, when we look at the literacy rate in India, the percentage has increased to 24.07%. And thus Maharashtra ranked second in Literacy growth rate. As per the study done by UNESCO to find out benefits of Literacy in Pacific countries, Literacy can enable people to develop their knowledge and capabilities in a range of areas. In this regard, women have often benefited greatly from non-formal literacy education programmes. It has been shown that when women gain literacy skills and are able to expand their learning in topics such as nutrition and health care, they achieve benefits in terms of improved health of both women and their children, and reduced child mortality. In addition, there is increased demand by women for access to education for their children, together with better learning achievements by their children.

And to cater to this benefit, Ministry of Health & Family Welfare, Govt. of India is implementing a green field project on e-health including Telemedicine on National Medical College Network (NMCN) for interlinking the Medical Colleges across the country with the purpose of e-Education and National Rural Telemedicine Network for e-Healthcare delivery. National Rural Health Mission is initiative taken up by the Government of India for the state of Maharashtra.

### What is NRHM?

The National Rural Health Mission (NRHM) was launched by the Hon'ble Prime Minister on 12th April 2005, to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups. The Union Cabinet vide its decision dated 1st May 2013, has approved the launch of National Urban Health Mission (NUHM) as a Sub-mission of an over-arching National Health Mission (NHM), with National Rural Health Mission (NRHM) being the other Sub-mission of National Health Mission. Maharashtra has

registered significant progress in improving life expectancy at birth, reducing mortality due to Malaria, as well as reducing infant and maternal mortality over the last few decades.

Following table shows the data for growth rates of Life expectancy at birth & Infant mortality rate.

	<b>Maharashtra</b>	<b>Tamil Nadu</b>
Life Expectancy at Birth in Rural Areas	67.2 yrs	75
Decline Rates of Infant Mortality Rate (IMR)	17	28

Ref. shodhganga.

In spite of the progress made, a high proportion of the population, especially in rural areas, continues to suffer and die from preventable diseases, pregnancy and child birth related complications as well as malnutrition. In addition to old unresolved problems, the health system in the country is facing emerging threats and challenges like, an estimated 5 million people in the country are living with HIV/AIDS, non-communicable diseases such as cardio-vascular diseases, cancer, blindness, mental illness and tobacco use related illnesses etc have imposed the chronic diseases burden on the already over- stretched health care system in the country. The current Doctor-Patient ration doesn't seem to be working with a such a huge population.

Following data shows the Growth rates of Doctors & Hospitals in Rural Areas.

	1981-1991	1991-2001
Growth rates of Doctors	38.72	39.1
Growth rates of Hospitals	40.12	45.79

Ref. shodhganga.

To bridge this gap, telemedicine came in picture. Indian public spending on health is amongst the lowest in the world, whereas its proportion of private spending on health is one of the highest. More than Rs. 100,000 crores is being spent annually as household expenditure on health, which is more than three times the public expenditure on health. The private sector health care is unregulated pushing the cost of health care up and making it unaffordable for the rural poor. Thus the country has to deal with rising cost of Health care.

The challenge of quality health services in remote rural regions has to be met with a sense of urgency. The urgent need is to transform the public health system into an accountable, accessible and affordable system of quality services. This understanding has led to the development of health mission in the country.

NRHM considers 5 approaches to implement this mission.

1. Communitee
2. Improved management through capacity
3. Flexible financing
4. Monitor progress against standards
5. Innovations in Human Resource Management

The objectives of Telemedicine are,

1. To provide expert consultation to patients in remote areas.
2. Video conferencing facility for online consultation.
3. To provide continuing medical education for Medical and Para Medical staff.

Telemedicine in Maharashtra started in 2006 in collaboration with ISRO at KEM Hospital Mumbai along with 5 remote centres.

Following table shows the expansion of telemedicine in Maharashtra.

Sept. 2006	KEM, Mumbai plus 5 remote centres
2007-2008	Telemedicine Expanded to additional, 20 Districts, 2 Sub-districts and 4 Medical Colleges
Feb. 2011	Telemedicine Network Shifted from ISRO Bandwidth to BSNL/MTNL Broadband
2011-2012	Telemedicine Network Expanded to 30 Sub-district/Rural Hospitals.

2014-2015	Telemedicine facility extended to 5 High focus/Tribal districts in SDH/Rural Hospitals - Manchar (Pune), Sangamner (A'Nagar), Chikhaldara (Amravati), Gokunda (Nanded), DH Nanded.
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Ref. NHRM website

Through Video conferencing facility, online consultation is provided to the Patients. Total 212207 patient referred & expert opinions given at District / Sub district / Rural hospital through telemedicine Centre. It is evident that telemedicine is a technology and ICT dependent service and there is a lot of exciting technologies that have arrived into the healthcare industry but as far as telemedicine is concerned it is undoubtedly the mobile sector that has got everyone's attention and has successfully penetrated in India. This has also become a medium for healthcare technology providers to ride on the wave and include mobile as a device to transact telemedicine services including the healthcare operatives.

## CHALLENGES & OPPORTUNITIES

Drugs and Vaccine Distribution System (DVDMS) or e-Aushadhi are the various schemes which currently used to deliver, procure medicines as per the available data from district and also as a part of Telemedicine.

Though, the user friendly features of mobile phones and its affordability, tele medicine is not being popular as it should be.

1. Earlier, in a telemedicine centre, most of the patient data such as ECG, blood reports, etc. were recorded on analog machines and then carried out on a manual data entry report in the software provided to them at the centre. Today, with the advent of mobility devices in the healthcare segment, most of these data sets can easily be shared and transferred on devices designed to be used in the rugged conditions of the rural India.
2. Due the absence of Central agency, telemedicine is not growing at the speed at which it should be. Hence there has to be centralized agency that can act as an umbrella body for telemedicine in India. Thus we first need a central body in the government that undertakes the mandate of tele-health in the country. We also need a dedicated policy on the telemedicine in India that provides guidelines and framework to weave the various activities that has been undertaken by different stakeholders in healthcare so far and also take the program ahead to the next phase.
3. There should be a nationwide network of telemedicine, where all stakeholders can share the resource pool, especially for the rural India wherein the specialist cover is many kilometers away.

## CONCLUSION

Thus we can conclude that India is actually taking various initiative to provide health care especially in rural area through telemedicine. Telemedicine can help to reach people in remote areas easily. Increased demand in mobile phones & internet, it is possible to reach out to an individual which was not possible earlier. So, the mobile devices have definitely brought-in mobility into the healthcare spectrum and a promise of wider reach than ever before. Tele conferencing, video conferencing, online subscription, are some of the means through which it can achieve maximum success in the area of e-health. NHRM has taken multiple initiative to provide better healthcare options. Tele medicine the new dawn of health care sector in India.

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## Organ Donation: India v/s Rest of the World

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### ABSTRACT

*A single organ donor can save up to eight people. More than 1,13,000 men, women and children are on the national transplant waiting list as of July 2019. 36,528 transplants were performed in 2018 but at the same time 20 people die each day waiting for a transplant. A person is added to the waiting list every 10 minutes. This research will help us to understand the relationship between awareness and people's attitude towards organ donation and to study the impact of awareness of organ donation in India as against the rest of the world. There were two different methods of study that were used in this research. First, literature reviews of articles and books about organ donation, people's attitude towards organ donation, rules and legislation of organ donation which gives basic information to deepen the understanding of the subject. Secondly, a survey method was used for collecting the data and questionnaire was used as a tool for conducting a survey amongst 107 respondents. This survey was conducted for a period of one week, during the first week of January 2020. The respondents being citizens of India, residing across the country.*

*The Primary Data Collected was further analysed and quantified through graphs. The graphs gave us an idea about the preferences opted by respondents and are further used to interpret the results. This result helps us to understand the relationship between awareness and willingness to donate organs amongst Indians as compared with the rest of the world.*

*To attain social acceptance of organ donation; we should minimize the difficulties of the organ donation process including avoiding delays in funerals, create public awareness for the benefit of organ donation. Both the community and physicians should therefore approach organ transplant positively and objectively and treat ethical, social and religious issues as negotiable perspectives, thus removing the barriers for organ harvesting.*

### INTRODUCTION

Organ donation refers to preserving a donor's organ like heart, liver, intestines, pancreas, kidneys, after the donor dies, for the purpose of transplanting the organs into the person who is in need of an organ. August 13 is celebrated as the World Organ Donation Day. The main purpose of this day is to motivate and encourage people to donate their organs and to save the life of an individual. Lakhs of people die every year waiting for an organ, one patient is added to the waiting list every 12 minutes.

Organ donation is characterized as a demonstration of giving at least one organ, without remuneration, for transplantation to someone else. Despite the fact that organ donation is an individual issue, the procedure has medicinal, legal, moral and social ramifications. Innovative advances in the previous years have upgraded the attainability of organ transplantation, which has pushed the interest in organs. Therefore, lack of organs has become a worldwide concern. In India, the Transplantation of Human Organs Act (THOA) was established in 1994. However, the rate of organ donation in India is poor (0.34 per 1,00,000 population) as compared to other nations. Likewise, organ donation following brainstem demise is rare in India. THOA (1994) characterizes brainstem passing as 'the phase at which all elements of the brainstem have forever and irreversibly stopped'. Social and cultural factors directly affect the attitude of the people towards organ donation. Culture and religion also influence the attitude towards organ donation. There are some common points that can improve people's willingness to donate their organs. The body of the deceased donor is not disfigured after organ donation. The donor's family will not be bearing any expenses for the transplant. It will be borne by the recipient. Unlike western countries, where an adult is free to make his choice about organ donation, in India it is usually decided in consultation with the family.

Organ donation can be done through two ways. Firstly, through living donation and secondly through deceased cadaver donation. Living donation happens when a living individual gives an organ or part of an organ for transplantation to someone else. The living benefactor can be a relative, for example, a parent, kid, sibling or sister, grandparent or grandkid. It can likewise originate from somebody who is sincerely identified with the beneficiary, for example, a great companion, a family member, a neighbour or an in-law. In the of deceased Cadaver donation, the patient must enrol himself to a hospital where transplants are carried out. The patient will

be put on a wait list. As and when the organ from a suitable expired contributor is accessible, the patient will be informed.

In 2016, around 82% of the organs transplanted in the United States were from expired benefactors—27,630 organs were transplanted from 9,971 deceased people, while living donators transplanted an extra 5980 organs. Organ donation rate for corpse in Spain is 35 per million as against .08 per million in India. Organ donation is a global issue, but India is far behind the western countries. Shortage of organs in India is huge as most patients with organ failure die while being on the waitlist. The percentage of patients who undergo kidney transplantation with last stage kidney disease is only 5%. A deceased organ donor can donate two kidneys, liver, two lungs, heart, pancreas and intestines, whereas a living organ donor can donate one kidney, one lung, a portion of liver, pancreas and intestine. In 2014, hands and faces were added to organ transplant list.

## LITERATURE REVIEW

India's first successful organ transplant was conducted in 1970s (kidney transplant). Since then, it has been a few strides forward, but a lot more needs to be done. The number of transplants done annually has been gradually increasing. Around 5000 kidneys, 1000 livers and around 50 hearts are transplanted every year in India. As compared to other countries organ donation rate in India is poor-0.8 per million whereas better performing countries such as Croatia's-36.5 per million, Spain's-35 per million and America-26 per million. With the rising donation rate of 1 per million, India would have 1100 organ donors, 2200 eye donors, 1000 heart donors, 1100 liver donors. This should suffice the need for current demands of organ donation. (Nalluswamy S, Shyamalpriya, Balaji, Ranjan, Yogendran)

One of the reasons for the low rate of organ donation is lack of information and awareness amongst the people. It is observed that public are accustomed to blood donation, but there is largely a hesitation regarding organ donation. To increase the rate of organ donors, it is essential that there is a positive attitude of the people towards organ donation. A study in Andhra Pradesh (a Southern state in India) reported that only 30% were aware of eye donation. However, in India, there is a lack of studies on awareness and attitude of the people about solid organ donation, especially in the rural areas. (Balajee, K. L., Ramachandran, N., & Subitha, L. (2016).

Shortage of organs for transplantation is majorly due to lack of information, false perception amongst the people and the negative attitude of people towards organ donation. It is an hour of the need to raise the knowledge level of individuals regarding various aspects of organ donation and it is necessary to eliminate the misconceptions that affect the rate of organ donation.

Looking further in other countries the organ donation rate is much higher as compared to India. In China, the Chinese authorities permitted the harvesting of organs from the prisoners without their consent or their family's consent. Due to this, in December 2005, the country's health manager estimated that almost 95% of the organs used came from such sources. Since then, China has banned this practice and is now focusing on regular civilians. Spain being the highest organ donating country in the world with 39.7 donors per million is working on a system known as "presumed consent". They consider all citizens as potential donors, unless they choose the option of opt-out. If the family refuses to donate the organ, the organs of the deceased cannot be harvested. But due to high level of educational awareness amongst the people, the refusal rate is very low, estimated to be just 15.3% in 2015. Other countries with presumed consent include France, Greece, Norway, Sweden and Turkey.

## RESEARCH METHODOLOGY

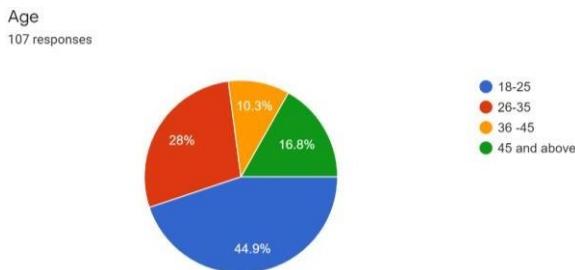
There are two different methods of study that are used in this research. First, literature reviews of articles and books on the subject of organ donation, people's attitude towards organ donation, rules and legislation of organ donation which gives us the basic information to understand the subject. Secondly, a survey method was used for collecting the data and questionnaire was used as a tool for conducting a survey among 107 respondents through social media. The survey was conducted during the first week of January 2020. The respondents being citizens of India, residing across the country.

# Our Heritage

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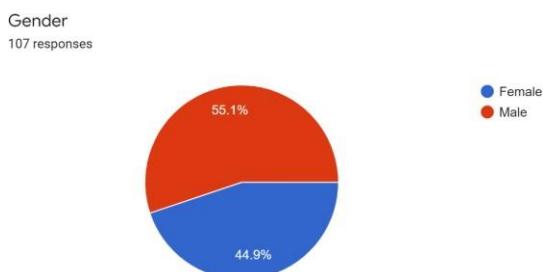
Vol-68-Issue-29-February-2020

## Pie chart-1



From the data we find that majority of the respondents are from the age group 18-25 followed by the age group 26-35, followed by the age group 45 and above and lastly the age group 36-45.

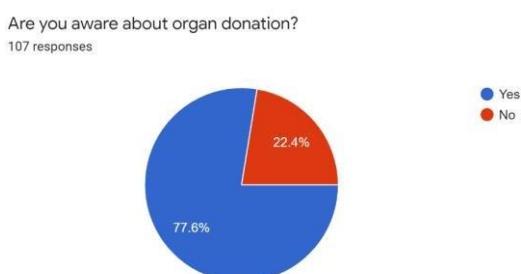
## Pie chart-2



From the data we find that 55.1% of the respondents are Male with 44.9% respondents being Female.

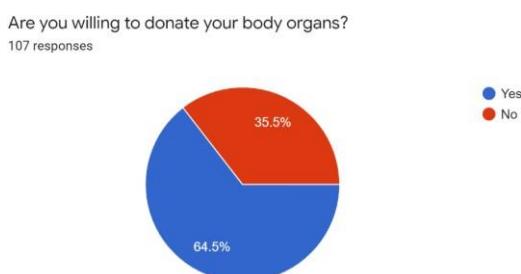
## DATA ANALYSIS

### Pie chart-3



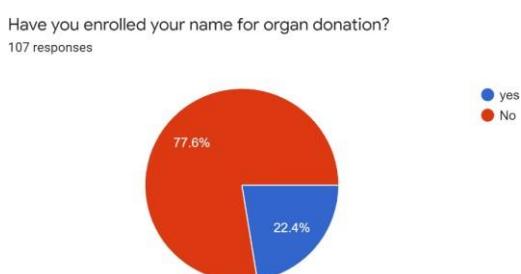
From the data we find that most of the respondents (77.6%) are aware about organ donation

### Pie chart-4



From the data we find that 64.5% of the respondents are willing to donate their body organ

### Pie chart-5



From the data we find that most of the respondents (77.6%) have not enrolled themselves for organ donation.

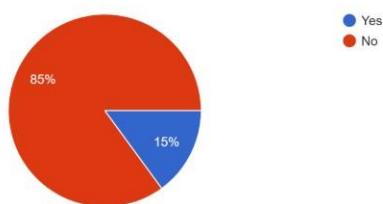
# Our Heritage

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## Pie chart-6

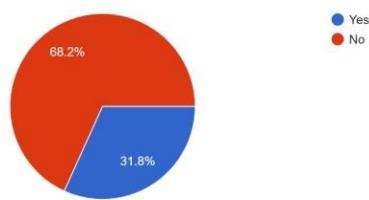
Is organ donation against your culture?  
107 responses



From the data we find that 85% of the respondents believe that organ donation is not against their culture.

## Pie chart-7

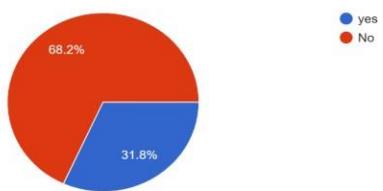
Do you prefer donating your organs to your close relatives/known only?  
107 responses



From the data we find that 31.8% of the respondents prefer donating their organs to close relatives/known people only while 68.2% of the respondents have no such barriers.

## Pie chart-8

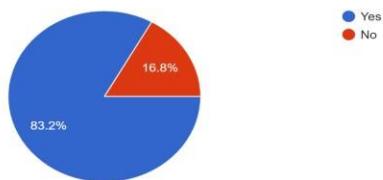
Are you aware of the rules and legislation about organ donation?  
107 responses



From the data we find that 68.2% of the respondents are not aware of the rules and legislations about organ donation.

## Pie chart-9

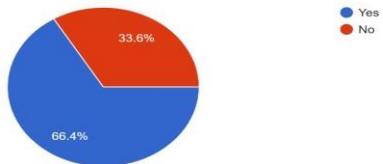
Do you agree there is lack of information about organ donation in our country?  
107 responses



From the data we find that 83.2% of the respondents believe that there is lack of information about organ donation in India while 16.8% believe that there is adequate information available.

## Pie Chart-10

Do you fear that the organ donated by you may be misused?  
107 responses



From the data we find that 66.4% of the respondents fear that the organ donated may be misused.

## HYPOTHESIS BUILDING

The rate of organ donation is dependent on factors such as awareness on the matter that determines the attitude of the people towards organ donation. Hence we are finding the dependency of the rate of organ donation on awareness among the people.

**H0:** Rate of organ donation is not dependent on the awareness of the people.

**H1:** Rate of organ donation is dependent on the awareness of the people.

## DISCUSSION

Organ donation has been on the agenda since the emergence of bioethics in the late 1960s, but it is not just an issue of domestic importance. Global bioethics scholars have increasingly asked why organ transplantation attracts so much attention and why we continue to spend enormous amounts of energy and resources on trying to supplement the donor pool when there are other more pressing concerns to be addressed, such as worldwide health inequalities relating to rising rates of diabetes, obesity, and end-stage renal failure.

On a global scale, bioethical concern about the shortage of deceased donor organs in developing countries, and the global movement of organs for transplantation, has resulted in international cooperation between professional and nongovernmental organizations, such as WHO and UNESCO, to eradicate illegal organ trade and trafficking. As part of The Declaration of Istanbul on Organ Trafficking and Transplant Tourism (2008), which prohibits global organ trading, country signatories are required to develop national self-sufficiency in organ donation.

It is incumbent upon signatories to the Istanbul Declaration to protect vulnerable populations in resource-poor countries from exploitation, by implementing programs to prevent organ failure and meet patients' needs within their own jurisdictions. Thinking about bioethics from an interdisciplinary perspective enables us to take these factors into account, as well as helping to inform understanding of the professional patient relationship and institutional practice.

## IMPLICATIONS

Organ donation is a safe procedure that gives new hope and a new life to thousands of people. Both the community and physicians should therefore approach organ transplant positively and objectively and treat ethical, social and religious issues as negotiable perspectives, thus removing the barriers for organ harvesting. To attain social acceptance of organ donation; we should, Minimize the difficulties of the organ donation process including avoiding delays in funerals, create public awareness for the benefit of organ donation.

## CONCLUSIONS AND SUGGESTIONS

Based on the data collected, it is observed that nearly 77.6% of the sample population are aware about the organ donation. But the willingness to donate reduces to 64.5%. We can say that though people are aware, but due to lack of motivation amongst the people, religious barriers, lack of legal knowledge and fear of the harvested organ being misused only 22.4% of the sample population has enrolled their names for organ donation.

### And hence the Null Hypothesis is accepted.

Finding a benefactor match is hard in any case. In India, this test is aggravated by bureaucratic obstacles and lack of awareness. The primary challenge is red-tapism and protracted administrative work. As indicated by existing guidelines, if the potential contributor isn't identified with the individual who needs the organ, the transplant should be approved by a state-level committee or by a hospital committee that includes government officials.

In India, as against the rest of the world there are very few surgeons and hospitals that have the necessary equipment. Ventilators for preserving the organs of brain-dead person and intensive-care unit personnel trained to manage such situations are prerequisites for a transplant.

Therefore, we have to take up more educational programs relating to the rules and legislation, organ donation process, its positive impact on the society, so as to increase the number of people who are willing to donate their organs also will take an initiative for the same by enrolling themselves for organ donation.

From the data collected, we can see that 64.5% of the respondents are willing to donate their organs, but most of them have not enrolled themselves for organ donation. Therefore, the people should be educated more about

the procedures of registration. The registration process should be transparent. In India more investment is required in hospitals in order to be properly equipped for transplants.

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## To study impact of GST on Health Care Sector

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### INTRODUCTION

The present study focuses on the efficiency of Indian health care sector, during pre and post GST Implementation period. The study would be useful for the investors and technical analysts, to make informed investment decisions, by understanding the market conditions relating to the performance of healthcare companies. The study would provide an understanding of the market efficiency of the Indian Healthcare Market. So basically study moves around three main aspects as stated above.

### OBJECTIVES

1. To analyse health care sector pre and post GST.
2. To understand market efficiency of Indian health Care Market.

### REVIEW OF LITERATURE

**Rashi Gupta (2017)** discussed the benefits and opportunity of goods and services tax and its impact on Indian economy. It was found that GST implementation influenced the Indian economy in a positive manner. **Meenakshi Bindal (2018)** tested the working mechanism of GST to evaluate the advantages and challenges of GST and found that GST mechanism has been designed in such a way that it is expected to generate good amount of revenue from health Care sector.

### Research Methodology

The project is based on Secondary data.

### DATA ANALYSIS

#### Results and Analysis

**Table 3 Results of Descriptive Statistics for the sample Health Care Indices during the Study Period**

Statistic	Nifty Pharma Post-GST	Nifty Pharma Pre- GST	S &P BSE Health Care Post-GST	S &P BSE Health Care Pre-GST
<b>Mean</b>	-0.002824	-0.003253	5.64E-06	-0.003129
<b>Std. Dev.</b>	0.053731	0.053566	0.011325	0.052973
<b>Skewness</b>	-17.28454	-17.46571	0.028419	-18.08113
<b>Kurtosis</b>	321.5023	325.8358	3.803688	340.8085
<b>Jarque-Bera</b>	1586624	1625582	10.00765	1779427

Source: Data collected from bseindia.com and nseindia.com and Computed using E-Views

**Table 3** presents the results of summary statistics for the Indian Health Care Indices, during pre and post GST. It is evident that the investors of listed companies of health care suffered losses during pre and post GST, as the mean returns were found to be negative. The mean returns were -0.002824 and -0.003253 for S&P NSE Nifty Pharma during post GST and pre GST. Similarly, BSE Health care recorded 0.00005, during post GST and -0.0031 mean returns during pre GST. The Standard Deviation which is an indication of deviation of returns was found to be the same [0.05], during the period of Pre and Post GST, for Nifty Pharma. The data during pre and post GST were skewed towards left and the kurtosis indicated Leptokurtic distribution, as the value was greater than three for all sample periods. The Jarque-Bera value was greater than five, for all indices, indicating normal distribution of data.

### CONCLUSION

Indian Health Care indices are not efficient in weak form during pre and post GST implementation. The nature of information does not have to be limited to financial news and research alone. In fact, information about political, economic and social events, combined with how investors perceive such information, whether true or rumoured, will also be reflected in the stock price. Undoubtedly, the implementation of GST had its effects on

all sectors and health care was not exempted. The setting up of GST Council for resolving the revenue share, between Centre and State, created panic among the investors with respect to the decisions taken in the Council. As a result, the investors withdrew money from the healthcare companies which resulted in volatility of healthcare indices during post GST. Hence, investors are advised to rely on fundamental factors of the companies, before taking investment decisions, as it serves as a strong parameter of any company, rather than any changes taking place in the economy.

## A Study on Impact of Soft Skills Training Programs among Graduates to Enhance Employability

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### ABSTRACT

*Training is a highly useful tool that can bring an employee into a position where they can do their job correctly, effectively, and conscientiously. In today's competitive world the expectation of companies, corporate and in market are very high from the fresher's. Training is the act of increasing the knowledge and skill of an employee for doing a particular job. Graduates have to smart enough by updating their soft skills which are required by an organization along with their curriculum. This study emphasizes how under graduates are getting their soft skill training along with their curriculum to enhance employability.*

**Keywords:** Training, Soft Skills, Curriculum, Employability

### INTRODUCTION

Training is the act of increasing the knowledge and skill of an employee for doing a particular job. Modern day Organization go for campus recruitments and out of 65000 students interviewed only 1100 students are having the ability to get employed. There are several reasons for this plight. Mostly under Graduate and Post Graduate lack soft skills such as basic maths, language, communication, technical and computer skills.

In the present scenario, there is a gap between what actually the employers expect and what students learn. This is due to the challenges of competition, technological advancement innovation in world market. This environment requires employees capable of solving problems as well as innovating new ways to improve the productivity

Many business leaders cite that there is mismatch between the skills needed and the talent which they receive. This creates problem of employability and to solve this problem higher educational institutions should consider inclusion of soft skill within curriculum

### STATEMENT OF THE PROBLEM

In higher Education students study about 20-25 subjects which are theoretical. Practical knowledge is almost nil for the graduates The University never give emphasis on Soft Skills and hence the problem of employability arises. The research problem here is to find out the reasons for lack of employability arises, and to find whether colleges are taking initiatives to provide soft skill programs for students along with their curriculum

### OBJECTIVES OF THE STUDY AS FOLLOWS

The Objective of the study are

- To study the role of training given by government and colleges in grooming students to become professionally ready.
- To examine whether students are taking initiative to exploit the opportunities provided to them by the training centers and Educational Institutions

### IMPORTANCE OF THE STUDY

The study is highly important due to following reasons.

Skill development is the need of ours because every employee requires maximum productivity with efficiency and effectiveness. Students lack with various skills such as interpersonal communication, business ethics, effective presentations skills, e-mail etiquettes, self-awareness, self-confidence, trustworthiness etc. It becomes very difficult with employers to get the work done. There is always a gap between the expectation of the employer and availability of Human resource. This study is emphasizing the employability skills which are to be inculcated among the students.

## LIMITATIONS OF THE STUDY

- Only commerce education is under consideration of this study
- Area coverage is very limited

## REVIEW OF LITERATURE

Prof. Lalita Sinha, in her book “ Technology and Skills in Education “ highlighted how Technology in Education been used in classrooms, how skill development had been through televisions and internet has taken place and also explained about the way technology skills for Education and students be used, and elaborated that how teachers can use technology and update themselves.

Rameshwari Pandya in her book Education Training and Skill Development in India, First Five Year plan (1951-1956) to Eleventh Five Year Plan (2007-2012) designed this book for the impact of Education from the elementary level to Higher Education in India, and also emphasized on different schemes launched by the Central Government.

Thompson (2001) acknowledges that social skills are crucial in interactive service work. Front line staff would transfer effective styles of interacting in their personal life into dealings with customers.

Gillard (2003) maintains that there should be two aspects of a university course that require consideration, they are employer expectations of graduates candidates and student preparedness to a course to make sure that students are equipped with employability skills like soft skills.

## RESEARCH METHODOLOGY

This is a quantitative research. It uses primary and secondary data analysis. Primary data is collected from 100 respondents in Mumbai which includes people of all genders, age group from 18 and above, Qualifications. Data is collected with the use of structured questionnaires.

### Hypothesis

#### Null Hypothesis

$H_0$ : The skill Gap is the major obstacle in the Job Market

#### Alternative Hypothesis

#### Statement of Hypothesis 1

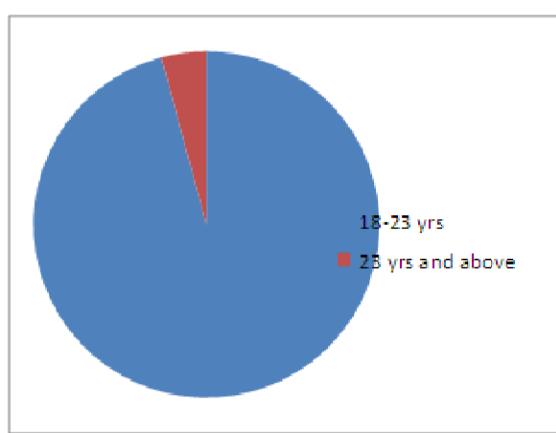
The Skill Gap is not the major issue in the Job Market.

#### Statement of Hypothesis 2

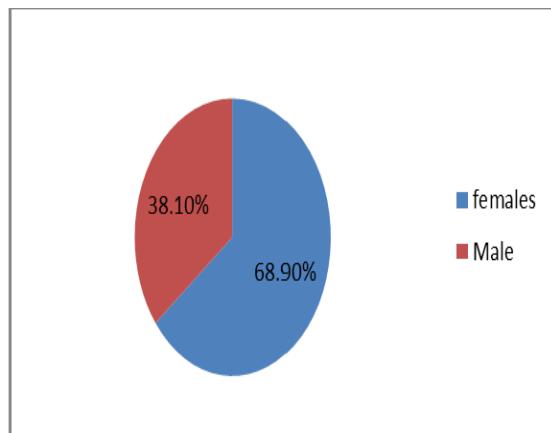
Employability skills are lacking among under graduate

#### Analysis and Interpretation

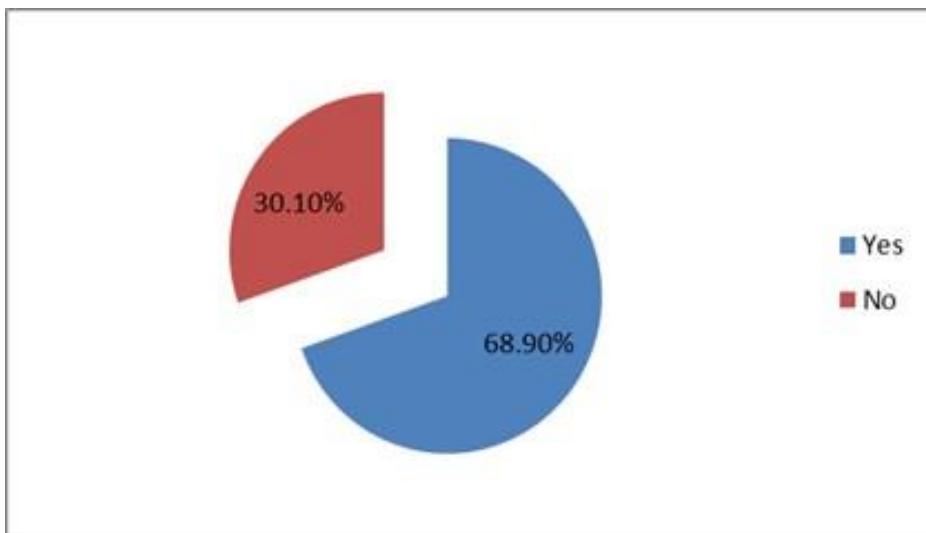
##### 1. Age



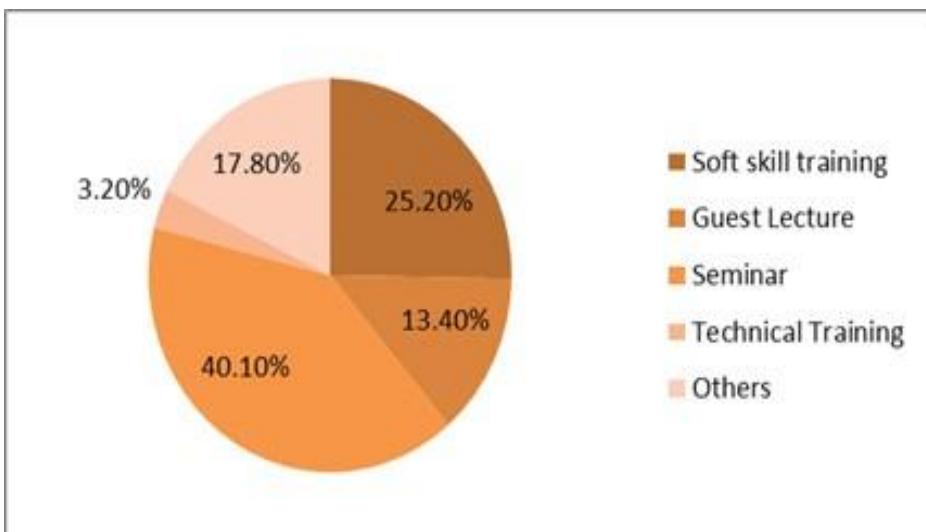
##### 2. Gender



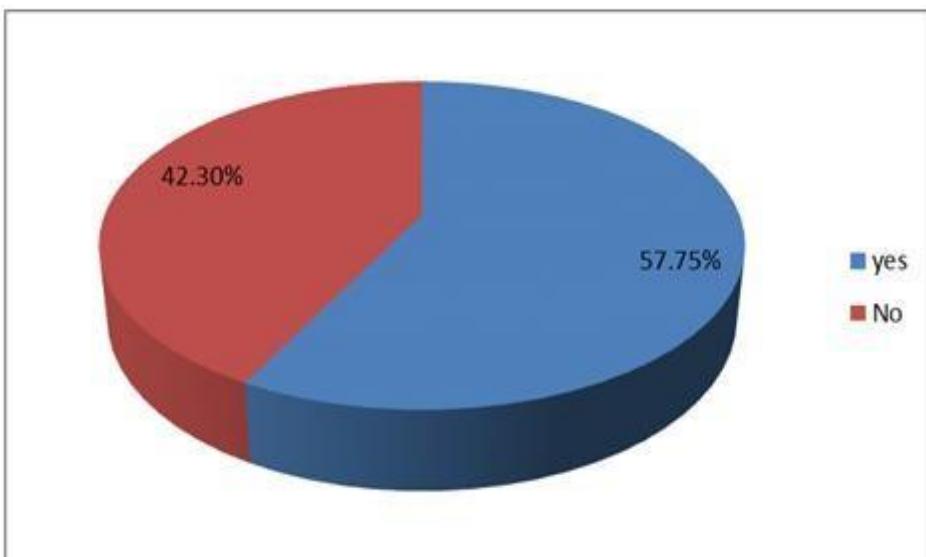
### 3. No.of students undergone for skill based programs in their college



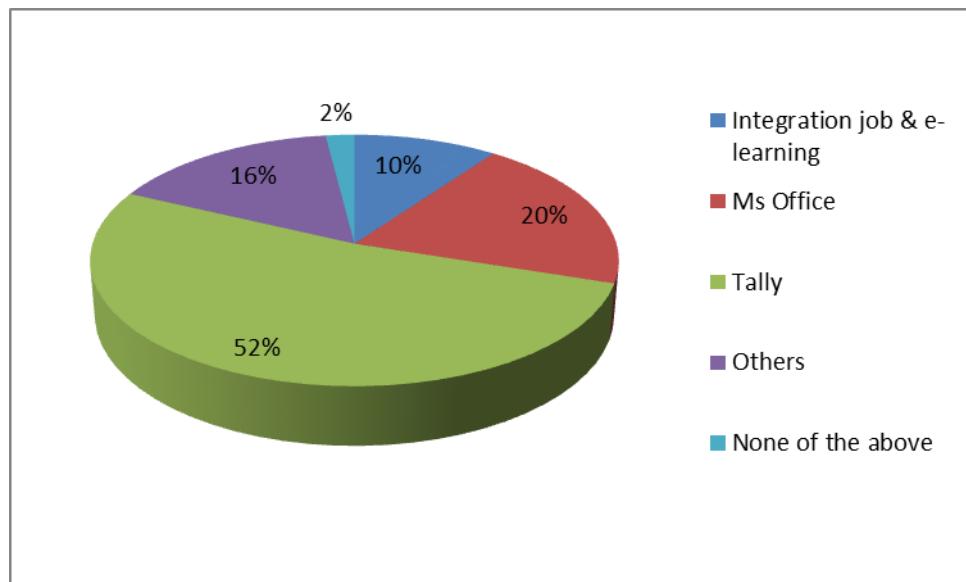
### 4. If Yes , What kind of skill based program you have attended



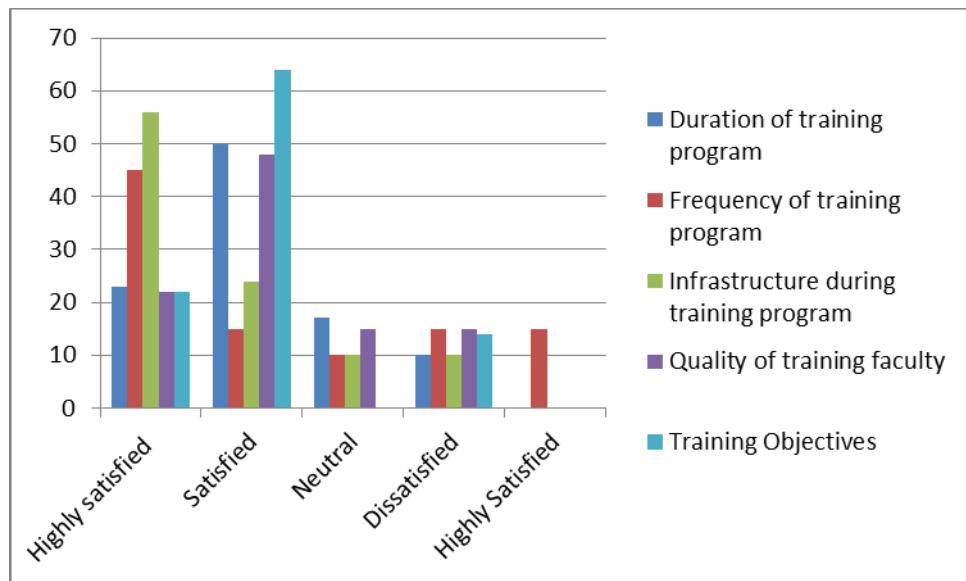
### 5. Have you attended any Soft Skill Program in your college?



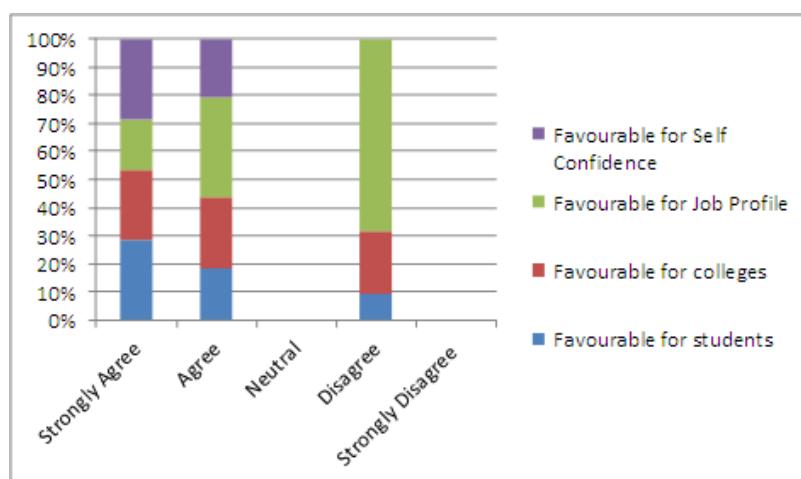
## 6. Does your college provide any technical training programs?



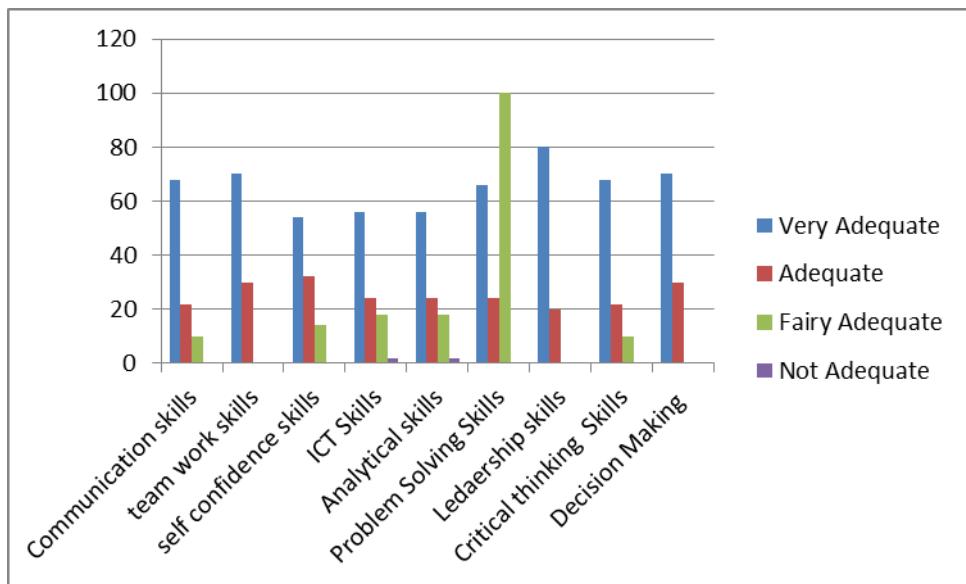
## 7. Are you satisfied with the quality of the training programmes conducted by the college?



## 8. Whether training programme has an impact on bridging a skill gap for students



## 9. How adequate is the college Curriculum is enhancing students acquisition of employability skills



## CONCLUSION

In this study as per the observations and data collections many colleges are taking initiatives to arrange soft skill and skill based training programs for the college students along with their curriculum in order to get self-confidence, and employability. And also college should tie up many soft skill programs with other agencies, Government and private institutions in order to update the students as per the organisation expectations

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- Samson Packianathan and Rajagopal Narayanan (2014) in their research article on Employability Skills a Conceptual Framework,

## Finding Hidden information in peptide Sequences of Flavivirus Subfamily Known Vector (Rocio and Rio bravo) with the Help of Data mining Techniques

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### ABSTRACT

Flavivirus, one of the most important viral pathogen which is also called from the yellow fever virus (flaivirus :yellow in Latin), belongs to the family Flaviviridae. The study of relationships among amino acid and other parameters in molecular sequences of these viruses are crucial for understanding mechanism of pathogenicity, infection, regulation and control of the disease. In view of above an attempt has been made to develop a model for mining quantitative association patterns in the amino acid sequence of flavivirus subfamily family. The sequences have been taken from online database "NCBI". The results generated have been analyzed for similarities and differences in associations among amino-acid of Rocio and Rio bravo subfamily of flavivirus. The association rules have been generated for redundant and non-redundant protein sequences using frequent and in-frequent patterns.

**Key words:-dataset, item set, Threshold, Support, Confidence, Pattern, Quantitative Association Mining.**

### INTRODUCTION

The flavivirus family contains many viral agents which produces encephalitis. Flavivirus encephalitis are either mosquito- borne, tick-borne, or have an known vector [4]. The viruses of the family Flaviviridae are important arthropod-borne viruses in both human and veterinary medicine. They are widely distributed throughout the world with the exception of the polar region, although a specific flavivirus may be geographically restricted to a continent or a particular part. They produce a broad spectrum of clinical responses in humans ranging from asymptomatic infection to fulminant encephalitis or hemorrhagic fever. Nearly 60 flaviviruses are known to exist but many are yet to be shown to cause disease in humans [5]. Major symptoms include mild acute febrile syndromes, severe neurological, hepatic and/or hemorrhagic disease. The geographical diversity of flavivirus has shown the occurrence of JEV in Asia, causing meningoencephalitis in children. [6], and WNV in west Africa, middle east, and from 1999 in North America[7] .DENV shows worldwide existence ,affecting 2.5 billion[8]. YFV causes serious infections manifested by fulminant hepatitis and severe hemorrhagic disease. YFV still kills a considerable number of people annually, despite the availability of an effective vaccine [9].

In 1993, Agrawal proposed an algorithm for extracting association rules from large databases [10]. Since then, association rule mining has become one of the main techniques for Knowledge Discovery in Databases (KDD).A good number of algorithms is reported in the literature [11-17] for association rule mining

Association analysis has proved to be a powerful approach for analyzing traditional market basket data, and has even been found useful for some problems in bioinformatics in a few instances. However, there are a number of other important problems in bioinformatics, such as finding biomarkers using dense data like SNP data and real-valued data like gene-expression data, where such techniques could prove to be very useful, but cannot currently be easily and effectively applied[18].

The problem of mining association rules in large relational table are introduced by Srikant R and agrawal [19].This technique can generate too many similar rules. They gave an algorithm for mining quantitative association rulesAttempts are also reported in the literature [21-24]for mining associations in molecular sequences.

The quantitative association rules approach read the nature of different amino acid that are present in the protein. This very basic analysis provides understandings into the Co-occurrence of certain amino acids in a protein. Such association rules are desirable for enhancing our understanding of protein composition.[20]

The peptide sequence contains lot of information about the various features and characteristics of the organism which needs to be explored by various techniques for better understanding of function and processes of the

organism. In view of above a model for mining association relations in Racio and Rio bravo subfamily of flavivirus is developed . The similarity and differences in association in amino-acid of these families have been analyzed and the association rules have been generated for redundant and non-redundant protein sequences using frequent and in-frequent patterns.

## MATERIALS AND METHODS

To perform the analysis of Mosquito borne the first step is to collect data of molecular sequences of known vector sub family like :- Racio and Rio bravo from NCBI database.

For studying the frequent patterns in redundant and non-redundant sequences frequency can be calculated as

$$\mu_i(A) = \sum_i^n f_i(A) \quad \dots \dots (1)$$

Where  $\sum_i^n f_i(A)$  is the sum of frequency of amino acid and  $\mu_i(A)$  is the frequency of amino acid .

A is the  $i^{\text{th}}$  sequence.

In this paper we assume that threshold can be defined by user

$$\text{The threshold is given by } \frac{\sum_{i=1}^n \max(ai) + \sum_{i=1}^n \min(ai)}{2} \quad \dots \dots (2)$$

Where a is amino acid and i is varies from 1 to 20

n is no. of sequence.

The apriori algorithm is employed to find frequent patterns in all the sequences. These patterns are used to generate ordinary association rule.

The frequency Support for n amino acid can be calculated as:

$$\sum \mu_i(A_1 \cap A_2 \cap A_3 \cap \dots \cap A_{n-1} \cap A_n) \quad \dots \dots (3)$$

Confidence for n amino acids can be calculated by;

$$\frac{\sum_i^L \mu_i(A_1 \cap A_2 \cap A_3 \cap \dots \cap A_{n-1} \cap A_n)}{\sum_i^L \mu_i(A_1 \cap A_2 \cap A_3 \cap \dots \cap A_{n-1})} \quad \dots \dots (4)$$

## RESULTS AND DISCUSSION

After applying the apriori algorithms on flavivirus known vector subfamily datasets, it has been found that there are variations in frequent amino acid patterns for redundant and non-redundant data set. In Known vectors for redundant dataset, for Rocio **L has high frequency**(13898.0)along with **W has low frequency** (2254.0) , for Rio bravo **L has high frequency**.(2202.0) along with **C has low frequency** (373.0) and for non-redundant dataset , for Rocio **L has high frequency**(12700.0) along with **W has low frequency**(2072.0) , for Rio bravo **L has high frequency**(1482.0) along with **C has low frequency** (278.0)) Frequency of amino acid depends on the total number of sequences .

The figure 1 shows the frequency of amino acids for Racio and Rio bravo known vector subfamilies of flavivirus.

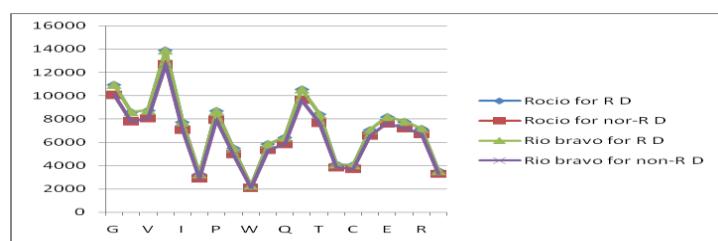


Figure3: Variation in Frequency of Redundant and Non-redundant amino acid Known Vector Subfamily

**Table-1 Maximum support in case of Known Vector**

Rocio		Rio bravo			
Redundant	Non-redundant	Redundant	Non-redundant		
SUPPORT OF THREE FREQUENT PATTERN [G, A, L, T, V, P, S]	SUPPORT OF THREE FREQUENT PATTERN [E, G, A, L, T, V, P, S]	SUPPORT OF THREE FREQUENT PATTERN [G, A, L, V, S]	SUPPORT OF THREE FREQUENT PATTERN [G, L, T, V, S]		
GLT SUPPORT = 8132.0	GLT SUPPORT = 7407.0	GLV SUPPORT = 1344.0	GLV SUPPORT = 919.0		
GLV SUPPORT = 8237.0	GLV SUPPORT = 7576.0	GLS SUPPORT = 1288.0	GLS SUPPORT = 885.0		
GLP SUPPORT = 8190.0	GLP SUPPORT = 7511.0	TOTAL NO OF THREE FREQUENT PATTERN: 2			TOTAL NO OF THREE FREQUENT PATTERN: 2
GLS SUPPORT = 8440.0	GLS SUPPORT = 7699.0				
TOTAL NO OF THREE FREQUENT PATTERN: 4	TOTAL NO OF THREE FREQUENT PATTERN: 4				

The Table 1 shows maximum support for known vector family of Flavivirus it is found that **A, G, L, T, and V** (Alanine, Glycine, Leucine, Threonine & Valine) are frequent in all subfamilies except of Rio bravo(known vector subfamilies). **S**(Serine) is also frequent in all subfamilies except Rocio(non-redundant). **P**(Proline) is frequent for Rocio.

**Table 2–Probable Structures and physicochemical Properties of Protein Sequences of Sub families**

Subfamily	Redundant			Non-redundant		
	Frequent Amino Acid	Probable Structure	Physicochemical Properties	Frequent Amino Acid	Probable Structure	Physicochemical Properties
Known Vector Subfamilis						
Rocio	G, A, L, T, V, P, S	Coil and Helix	Polar aliphatic (G), polar uncharged(T,S), non-polar aliphatic(A,L,V) and hydrophobic(G,L,V), Non-polar(P), CBetaBranched(T,V)	E, G, A, L, T, V, P, S	Helix and Coil	Acidic Negative charged protein stable (E), Polar aliphatic (G), polar uncharged(S,T), non-polar aliphatic(A,L,V) and Non-polar(P), hydrophobic(G,L,V), CBetaBranched(T,V)
Rio bravo	G, A, L, V, S	Helix, Coil	Polar aliphatic (G), non-polar aliphatic(A,L,V), and hydrophobic(G,L,V), CBetaBranched(T,V)	G, L, T, V	Coil	Polar aliphatic hydrophobic (G), non-polar aliphatic(L,V), polar uncharged(T) and Hydrophobic(G,L,V),

It has been found in Table 2 that maximal frequent amino acid patterns of known vector subfamilies are different. Most of the amino acids are common and belong to hydrophobicity, CBetaBranched, polar aliphatic and uncharged, non-polar aliphatic group. The variations among the subfamilies are in Acidic Negative Charged, Protein stability and basic positive charged group.

**Talbe-3 Probable Helix Structure of Protein of flavi virus based on amino acid association**

Subfamily	Helix Formation							
	(A,R,E,Q,L,K,M,H)							
	Redundant				Non-redundant			
	1-Frequent Patterns	2-Frequent Patterns	3-Frequent Patterns	4-Frequent Patterns	1-Frequent Patterns	2-Frequent Patterns	3-Frequent Patterns	4-Frequent Patterns
Rocio	A,L	AL	None	None	A,E,L	AL,EL	None	None
Rio bravo	A,L	AL	None	None	L	None	None	None

**Talbe-4 Probable Sheet Structure of Protein of flavivirus based on amino acid association**

Subfamily	Sheet Formation							
	(V,I,T,C,W,F,Y)				Non-redundant			
	Redundant				Non-redundant			
	1-Frequent Patterns	2-Frequent Patterns	3-Frequent Patterns	4-Frequent Patterns	1-Frequent Patterns	2-Frequent Patterns	3-Frequent Patterns	4-Frequent Patterns
Rocio	V,T	None	None	None	V,T	None	None	None
Rio bravo	V	None	None	None	V,T	None	None	None

**Talbe-5 Probable Coil Structure of Protein of flavivirus based on amino acid association**

Subfamily	Coil							
	(N,D,P,S,G)				Non-redundant			
	Redundant				Non-redundant			
	1-Frequent Patterns	2-Frequent Patterns	3-Frequent Patterns	4-Frequent Patterns	1-Frequent Patterns	2-Frequent Patterns	3-Frequent Patterns	4-Frequent Patterns
Rocio	G,P,S	GP,GS	None	None	G,P,S	GP,GS	None	None
Rio bravo	G,S	GS	None	none	G,S	GS	None	None

In Table 5 it's observed that known vector subfamilies have two frequent patterns AL which are responsible for formation of secondary structure Helix. and amino acid E is also present in non-redundant dataset of Rio bravo which is important in helix formation. Parallel analysis can be ready for rest of the subfamilies in table 4 and 5 to produce association rule.

It has been shown in table 3,4 and 5 that in known vector subfamilies of flavivirus, association patterns of amino acid exposed high tendency to form Coil rather than Helix and Sheet.

The association rules generated on the basis of above known vector subfamilies are given below:-

## KNOWN VECTOR SUBFAMILIES

**I. {A(Frequent)∩L(Frequent)}=>Tendency for Helix Formation}**

**II. {G(Frequent)∩S(Frequent)}=>Tendency for Coil Formation}**

**III. {G(Frequent)∩P(Frequent)}=>Tendency for Coil Formation}**

## CONCLUSION

The approach for mining quantitative associations is appropriate in view of analysis and prediction of secondary structure of sequences for known vector subfamily of flavivirus. Further quantitative associations have been obtained successfully to generate association rules for predicting the physiochemical properties and secondary structure. This approach will lead to develop fuzzy set and soft set based approaches for mining association in flavivirus sequences and their structures. These studies can be performed to generate association rules, signatures and their relationships along with physiochemical properties.

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## Enterprise Resource Planning (ERP) implementation in Medical Sector

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### ABSTRACT

*The aim of this research paper is to address specific issues regarding standard SAP ERP implementation in a medical sector. Data will treat selected issues which could make trouble standard SAP ERP implementation through predefined ERP implementation methodology for SAP ERP. This study analyses ERP in the healthcare institution and seeks ways to improve healthcare service by implementing ERP systems. In general, current business environments have taken different shapes, and ERP systems are essential in improving the efficiency of an organisation and its strategic decision-making.*

### INTRODUCTION

The project was initiated by management of the hospital and medical college with purpose to eliminate the impotence of the current info system. Analysis of the current economic system and the list of new system requirements have been adapted by an external consultant company. This was needed for announcing a public tender for selection of the ERP software quick fix integrator. This study target on how ERP systems have been used in healthcare institution and how they could be used to better their efficiency. Traditional healthcare organisations use segregated information systems. Therefore, these institution are challenged in sharing important info amongst different entities. The study also highlights the advantages of ERP for management that successfully implement and integrate this system.

As recommended by external consultant the main goals of the study were:

- To centralize the information system (create/provide a centralized database)
- To increase data integrity and consistency
- To focus on accounting and financial department processes
- To provide comprehensive and accurate reports for top management

The project incorporated five SAP modules: FI (Finance), CO (Controlling), MM

(Material management), SD (Sales and Distribution) and HR (Human resources). SAP integrator offered a team of seven SAP solution consultants, including one SAP system administrator. In addition, two consultants (ABAP programmers) were teamed up for specific ABAP developments. During the execution it became clear that the number of consultant was deficient, given the project scope and specific demands in medical service sector.

Advantages ERP can bring to healthcare.

The use of ERP software solution is considered to be basic as it helps hospitals and healthcare institution remain competing and support their development, merger and gain in the 21st century. With the help of ERP systems you can have a circumstance to:

- Streamline healthcare processes
- Provide the victim with highly secure remote access to databases with the help of option devices
- Reduce practical costs and do whatever possible in order to boost profitability
- Improve patient care and withstand competition with other medical organization.
- Utilize effective search facilities
- Take advantage of simple centralized backup options.

It is commonly known that many healthcare organization are focused mainly on developing the quality of medical care at the same time increase back-end operations, reducing costs and expand profits. Our experienced domain professionals assure you that with the help of ERP quick fix all the goals described above can be easily accomplish by optimization of business process.

## METHODOLOGY

Advantages of ERP in healthcare sector are multifaceted. The platform acts as a centralized system that integrates information from multiple departments. This improves data visibility and allows all applicable personnel to access the info they need, at any single instance. With the help of ERP systems:

- Patient information and data archives can be managed and utilized better.
- Process automation eliminates the chance for data duplication and reduces errors.
- Superior customer relationship management (CRM) results in better patient service, cost savings, and generate more opportunities.
- Replacing manual charting with Electronic Health Records (EHR) increases the efficiency of accessing and sharing information.
- With all the information available on a single system, cloud ERP in healthcare units prompt better care and treatment plans for patients.
- Considerably better financial controls because the information is centralized, integrated and more accessible to everyone concerned.
- Today, enterprise resource planning technology is changing the way your healthcare organization operates, provided you choose the right solution. And so you need experts' guidance in selecting the software that is innovative, easy-to-use, and most importantly fits your requirement to provide quality patient care with complete safety.

## FACTORS WHICH AFFECT THE IMPLEMENTATION

These factors can be separated into two categories, which are:

(a) national-environmental factors and (b) organizational-internal factors.

The first category of factors (national-environmental) includes, the following five factors:

- Economy and economic growth
- Infrastructure (both basic and IT infrastructure)
- Manufacturing strengths
- Government regulations and
- Regional environment.

Instead, the second one (organizational-internal) includes the following five factors:

- Business size
- IT maturity (of the organization)
- Computer culture (of the organization)
- Business Process Reengineering (BPR) experience
- Management commitment.

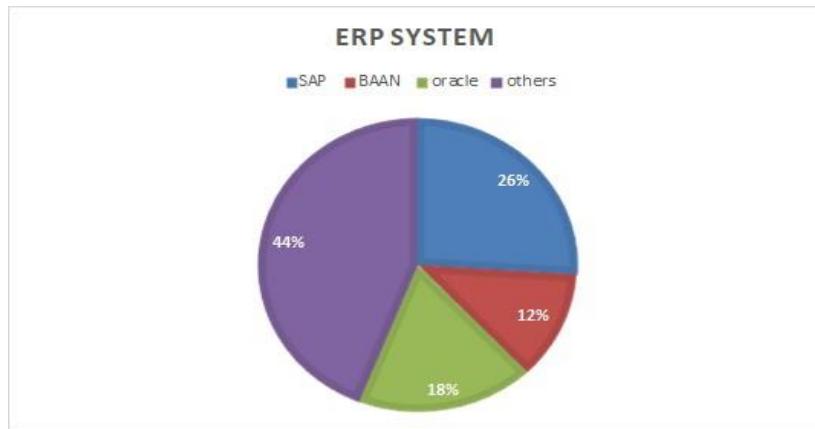
## IMPLEMENTATION OF ERP IN HEALTHCARE

Institution of healthcare have many different systems that are not linked and only share info within the branch. ERP market was at its biggest segment of the operation budget which stood at 34% in 2002 and thought it would continue like that through 2004. Accordingly they estimated that 15% of institution that did not have ERP implemented in their institution were planning to do so in 12 months on ground that the economy allowed the ERP asset. Construction and service institution were either using ERP or implementing ERP systems.

Therefore, there is still room for other forms of institution such as the Healthcare, Defence, Automotive and Aerospace for new implementation of ERP systems .

## DATA ANALYSIS

There are various institution providing ERP services and the common organisations are as follow with their market share. . These are notable institution that are suppliers of ERP systems. SAP has the biggest share of the market with a 26% share followed by Oracle who have 18%, Baan are with 12%,others which includes several institution have 39% shares



## REVIEW OF LITERATURE

**Schaper(2002)** observes that small and medium-sized enterprises make a major contribution to economic growth and employment in most countries around the world. The collective impact of SMEs is influential as they represent about 95% of all private sector firms in most modern nations and so form a major portion of all economic activity. They account for 35% of exports from Asia and approximately 26% of exports from developed countries including the United States(9). Knight (2000) observed out that in selected countries such as Italy, South Korea and China, SMEs contribute as much as 60% of total national exports.

**Sandoe et al. (2001)** observe that ERP streamlines the processes within an organization and helps improve its overall efficiency, while providing means to bolster competitive performance, increase the speed of responsiveness to customers and strategic initiatives.

**Kang et al. (2008)** synthesized that these ERP systems display four fundamental characteristics:

- ERP systems can be considered as multinational systems since they reflect national laws and regulations from specific country environments.
- ERP systems comprise reference models that reflect preferred business models in terms of best practices, data employed and organizational structure.
- ERP systems integrate all business processes within an organization, enabling real time access to the same information.
- ERP systems provide flexibility, allowing organizations to customize the system to fulfil specific scenarios and circumstances.

It can be seen that literature survey mainly concentrates on ERP implementation, ERP optimisation and ERP software among others. ERP software has become one of the advanced technologies to be embraced and perhaps, one of the fastest technologies being adopted by Fortune 1000 companies. ERP systems enable real time access to the same information which is crucial for decision making in the organisations.

## CONCLUSION

The target of the study was to find out how ERP systems have been implement in the healthcare sector and how they could be used. This was done by applying literature study.

The results of the literature review showed some aspects of what has been done in the healthcare sector with regard to ERP systems. Improving the availability and quality of info in the healthcare institution may lead to good decision making processes, thereby improving the quality of healthcare.

## Application of Health Care using in Image Processing

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### ABSTRACT

*It is human vision restriction that we can't find in volumes , even we can't see varieties in volumes of any pictures. With the progress in innovation it is presently conceivable to check these volumes precisely with factually demonstrated outcomes. Advancement of picture handling and Computer Vision in medicinal services segments are required to be investigated. In spite of the fact that this field has been extended a great deal over the most recent couple of decades, still the advances are not good. Consequently, we have tried to dive into the social insurance utilizing picture preparing and Computer Vision. The use of PC based innovation in therapeutic instruction framework is being both the fulfilling and testing. The rundown number of sickness can be deciphered utilizing picture handling innovations beginning from 2D pictures upto complex four dimensional Doppler pictures. Two measurement pictures like x beam pictures like lung issue tuberculosis, lung emphysema, pneumonia and so on can without much of a stretch gathered and handled. The different bone issue like cervical spondylosis, hard breaks, malignancies, subclinical bone material changes can be survey and handled. The utilization of 3D pictures from CT sweep and MRI will be all the more testing in treating and analysis infections worry with Head and stomach area district. Commitment of picture handling can be conceivable in sickness expectation and as prognostic instrument.*

### INTRODUCTION

It is human vision restriction that we can't find in volumes, even we can't see varieties in volumes of any pictures. With the progress in innovation it is presently conceivable to check these volumes precisely with factually demonstrated outcomes. Image Processing and Machine Learning, the two trending topics of today market. Most picture preparing systems include treating the picture as a two-dimensional sign and applying standard sign preparing systems to it. Current computerized innovation has made it conceivable to control multi-dimensional signs with frameworks that range from basic computerized circuits to cutting edge parallel PC's. In present day science and advancements, pictures likewise increase a lot more extensive degrees due to the ever developing significance of logical perception (of frequently huge scale complex logical/test information). Prior to going to handling a picture, it is changed over into a computerized structure. Digitization incorporates inspecting of picture and quantization of examined values. Subsequent to changing over the picture into bit data, preparing is performed. This preparing procedure might be picture upgrade, Image rebuilding, and picture pressure. With the assistance of picture preparing changes might be finished with picture upgrade, picture reclamation and picture pressure. The two sorts of techniques utilized for Image Processing are Analog and Digital Image Processing. Simple or visual techniques of picture handling can be utilized for the printed versions like printouts and photos. Picture examiners use various essentials of understanding while at the same time utilizing these visual systems. The picture preparing isn't simply confined to region that must be examined yet on information on analyst. Association is another significant

apparatus in picture processing through visual strategies. So investigators apply a combination of individual information and insurance information to image processing. Digital Processing procedures help in control of the digital pictures by utilizing PCs. As crude information from imaging sensors from satellite stage contains deficiencies. To get over such imperfections and to get creativity of information, it needs to experience different periods of processing .The three general stages that a wide range of information have to undergo while utilizing computerized method are Pre-processing, enhancement and show, data extraction. Image preparing fundamentally incorporates the accompanying three steps. Comparable picture handling strategies are found moreover accommodating in instances of retinopathy. The pictures are to be gotten and followed under procedure. The information will be dissected and interpreted.<sup>4</sup> Imagers are an undeniably huge wellspring of tangible perceptions about human action and the urban condition. Image Scape is a product instrument for handling, grouping, and perusing huge arrangements of pictures. Actualized as a lot of web administrations with an Adobe Streak based UI, it underpins bunching by both picture highlights and setting labels, just as retagging of pictures in the client interface.<sup>5</sup> Diabetic retinopathy is a serious and generally spread eye ailment. It is the commonest reason for legitimate visual impairment in the working-age populace of created nations. That is the purpose behind the heightened exertion that has been embraced in the most recent years in creating devices to

aid the determination of diabetic retinopathy. Picture preparing has been discovered one of promising device in conclusion of diabetic retinopathy. Picture handling of shading fundus pictures can possibly play a significant job in conclusion of diabetic retinopathy. There are three distinct manners by which it can contribute: picture improvement, mass screening (counting identification of pathologies and retinal highlights), and observing (counting highlight recognition and enrolment of retinal pictures). Effective calculations for the discovery of the optic plate and retinal exudates have been exhibited. Strength and precision in correlation with human graders have been assessed on little picture database.

## Proposed System

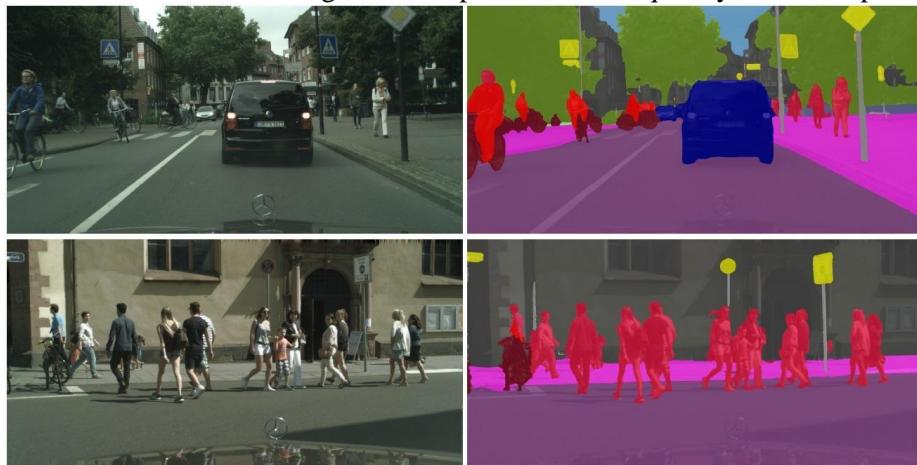
Segmentation is a procedure that is utilized to distinguish an object or pattern in the given work space. The fundamental goal is to partition a picture into a few portions with the goal that each segment can be investigated precisely. The starter function is to peruse the information picture. Here the info picture is MRI image. The information picture may contain RBG shading and this RBG shading ought to be evacuated so that the further process will be upgraded unmistakably. So the RBG shading ought to be converted to greyscale picture. Division activity is performed with the same about greyscale picture. There may be presence of commotion in the picture. So it must be expelled by the commotion evacuation method. At that point the morphological operation incorporates identification of the whole cell, widening of the cell, filling the whole holes, smoothing of the article is done simultaneously. The steps are as per the following:-

- Segmentation
- Image Enhancement
- Image Filtering
- Noise Reduction

The primer capacity is to peruse the information image. Here the input picture is MRI picture. The information picture may contain RBG shading and this RBG shading ought to be evacuated so that the further procedure will be improved obviously. So the RBG color ought to be changed over to grey scale picture. Segmentation operation is performed with the same about grey scale image. There might be nearness of clam or in the picture. So it must be removed by the clam or expulsion strategy. At that point the morphological activity incorporates recognition of the entire cell, enlargement of the cell, filling the whole holes, smoothing of the object is done all the while.

## 1. SEGMENTATION

Picture segmentation is where the picture can be partitioned into group of pixels which are comparative based on some criteria. Various gatherings must not communicate with one another, and neighboring cells can be looked at. The outcome of segmentation is the separating of the picture into connected areas. In this manner division is worried about isolating an image into significant regions. MR picture division is a significant however a difficult problem in medicinal picture handling. All in all, it cannot be fathomed utilizing direct, customary image processing strategies. There will be some variety in signal powers for one same tissue type, which influence the tissue intensities. Segmentation process is subsequently utilized to partition such cells.



## 2. IMAGE ENHANCEMENT

Picture upgrade methods are numerical systems that are planned for acknowledging improvement in the nature of a given picture. The outcome is another picture that exhibits certain highlights in a way that is better in some sense when contrasted with their appearance in the first picture. One may likewise determine or register different prepared renditions of the first picture, each exhibiting a chose highlight in an upgraded appearance. Straightforward picture upgrade methods are created and applied in a specially appointed way. Propelled methods that are streamlined regarding certain particular necessities and target criteria are likewise accessible.

### 3. IMAGE FILTERING

At the point when a picture is gained by a camera or other imaging framework, frequently the vision framework for which it is expected can't utilize it straightforwardly. The picture might be ruined by arbitrary varieties in force, varieties in light, or poor differentiation that must be managed in the beginning periods of vision preparing. This part talks about techniques for picture improvement planned for wiping out these unwanted attributes. The section starts with histogram adjustment, trailed by a short audit of discrete straight frameworks and recurrence examination, and afterward inclusion of different separating methods. The Gaussian smoothing channel is canvassed inside and out.

### 4. NOISE REDUCTION

Pictures are regularly debased by clamors. Clamor can happen and got during picture catch, transmission, and so forth. Commotion evacuation is a significant errand in picture handling. When all is said in done the consequences of the commotion evacuation impact the nature of the picture preparing methods. A few procedures for clamor expulsion are entrenched in shading picture handling. The idea of the clamor expulsion issue relies upon the kind of the commotion ruining the picture. In the field of picture commotion decrease a few direct and nonlinear separating techniques have been proposed. Straight channels are not ready to viably kill motivation commotion as they have a propensity to obscure the edges of a picture. Then again nonlinear channels are appropriate for managing motivation commotion. A few nonlinear channels dependent on Classical and fluffy procedures have risen in the previous scarcely any years. For instance most traditional channels that evacuate at the same time obscure the edges, while fluffy channels can join edge safeguarding and smoothing. Contrasted with other nonlinear strategies, fluffy channels can speak to information in an understandable manner. In this paper we present outcomes for distinctive sifting strategies and we think about the outcomes for these procedures.

### CURRENT TRENDS

These days utilization of picture handling is a developing biomedical apparatus contributing improvement of medicinal services part. Picture preparing devices gives a extensive arrangement of reference-standard calculations, capacities, and applications for picture handling, investigation, representation, and calculation improvement. You can perform picture examination, picture division, picture improvement, clamor decrease, geometric changes, and picture enrollment. Numerous tool kit capacities support multicore processors, GPUs, and C-code age. Picture Processing apparatuses underpins a different arrangement of picture types, including high unique extend, gigapixel goals, installed ICC profile, furthermore, tomographic. Perception capacities and applications let you investigate pictures and recordings, analyze a locale of pixels, alter shading and complexity, make forms or histograms, and control areas of intrigue (returns for capital invested). The tool compartment bolsters work processes for preparing, showing, and exploring enormous pictures. The utilization of coordinated information on biophysics, gadgets, PC applications like Minitab, MATLAB, CAD-CAM and so forth included new skylines in Biomedical part in created nations. The readymade arranged programming based applications discovered promising lifeline in persistent finding and sickness the board. As of now in India, a picture handling innovation is in incipient organism stage. It is limited uniquely at institutional base or at inquire about level as it were. There are noted barely any applications in ongoing patient administration of illness evaluating and so on.

#### • Image processing based Breast Cancer Detection Using Mammograms

In created nations bosom disease is a one of the most driving carcinoma. The American Cancer Society prescribes a mammography to each ladies after their 40 s age as screening help. Confusion of bosom malignant growth signs bring about 52% of the mistakes and 43% of the blunders are caused due to neglecting signs in anomalous scans.[3] There are discovered mistakes during results understanding utilizing mammographs. This affectability of mamographs shifts with picture quality and mastery of radiologist. The endeavours were made to institutionalize with utilizing mechanized advancements. There are recorded a few papers clarify the utilization of picture handling and maintain a strategic distance from conceivable outcomes concerning mistakes.

- **Image processing based retinopathy detection using retina images**

Comparative picture preparing methods are found too supportive in instances of retinopathy. The pictures are to be acquired and followed under procedure. The information will be investigated and interpreted.<sup>4</sup> Imagers are an inexorably huge wellspring of tactile perceptions about human movement and the urban condition. Image Scape is a product device for preparing, bunching, and perusing enormous arrangements of pictures. Actualized as a lot of web administrations with an Adobe Streak based UI, it bolsters bunching by both picture highlights and setting labels, just as retagging of pictures in the client interface.<sup>5</sup> Diabetic retinopathy is an extreme and generally spread eye malady. It is the commonest reason for legitimate visual impairment in the working-age populace of created nations. That is the explanation behind the escalated exertion that has been attempted in the most recent years in creating apparatuses to aid the determination of diabetic retinopathy. Picture preparing has been discovered one of promising device in analysis of diabetic retinopathy. Picture preparing of shading fundus pictures can possibly play a significant job in determination of diabetic retinopathy. There are three unique manners by which it can contribute: picture upgrade, mass screening (counting location of pathologies and retinal highlights), and checking (counting highlight location and enlistment of retinal pictures). Effective calculations for the recognition of the optic plate and retinal exudates have been introduced. Strength and exactness in correlation with human graders have been assessed on a little picture database.

- **Image processing and India**

The use of PC based innovation in therapeutic instruction framework is being both the fulfilling what's more, testing. The presentation of various material based learning helps including PC applications as different programming projects , web and media communications has the capability of changing the substance of therapeutic education.<sup>6</sup> India is in incipient organism stage in biomedical field due to instruction design created and received by our framework. There is no extension for association with specialists also, biomedical specialists or designers at proficient level. The specialists are even less inspired by interdisciplinary methodology. These days this disappointment is evolving. The appearance web, section of interdisciplinary biomedical diaries, private segment section began changing these conventional perspectives. The junior specialists in India are presently increasingly forceful furthermore, with more noteworthy potential. The need of biomedical building and difficulties is underlined by youthful specialists. There is wide degree and job of these systems in Indian situation. The wide patient information , number of emergency clinics and coordinated research units , web offices will can possibly change conventional methodologies among investigate and applications in everyday life in quiet advancement . The rundown number of infection can be deciphered utilizing picture handling advances beginning from 2D pictures up to complex four dimensional Doppler pictures. Two measurement pictures like x beam pictures like lung issue tuberculosis, lung emphysema, pneumonia and so on can without much of a stretch gathered and handled. These chest issue can be evaluated and designing tree as indicated by Indian pattern. The different bone scatters like cervical spondylosis , hard breaks , malignancies , subclinical bone material changes can be evaluate and prepared. Cervical spondylosis is normally an age-related condition that influences the joints what's more, neck. It creates because of the mileage of the ligament and bones are of the cervical spine. These wear and tears can be reviewed utilizing picture handling strategies. By and large doctor analyze the patient of cervical spondylosis by side effects , anyway reviewing can be troublesome utilizing advanced x beams . Picture handling may include more precision in such cases. This equivalent will be appropriate to other bone disorders. These bone issue can be effectively checked and evaluated basically utilizing computerized x beams .The utilization of 3D pictures from CT output and MRI will be additional difficult in treating and conclusion sicknesses worry with Head and belly area. At last creators might want to suggest for foundations interdisciplinary methodology and ramifications of these methods for quiet advancement.

## CONCLUSION

In this paper, we talked about various sifting strategies for evacuating clamors in shading picture. Besides, we introduced what's more, thought about outcomes for these separating procedures. The results got utilizing middle channel procedure guarantees clamor free and nature of the picture also. The principle focal points of this medium channel are the de-noising ability of the demolished shading segment contrasts. Subsequently the technique can be appropriate for different channels accessible at present. In any case, this system expands the computational multifaceted nature. Our future research will be centered around the development of other Median sifting strategies for shading pictures to stifle different kinds of clamors.

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## Identification of novel HLA alleles in potential marrow donors from an Indian Registry in Mumbai

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### ABSTRACT

We characterized 15 new HLA Class I and II alleles from among 1152 voluntary bone marrow donors registered with Marrow Donor Registry (India), as a result of high-throughput next generation sequencing. Data analysed using NGSengine® V2.9.0.10411 (GenDX, The Netherlands) after sequencing by Sequel (Pacific Biosciences, USA) revealed 4 new alleles in HLA-A, 2 in HLA-B, 6 in HLA-C, 1 in HLA-DRB1 and 2 in HLA-DQB1 genes. We observed more of single nucleotide mutations with 3 synonymous and 12 non-synonymous mutations. Mutations were seen in exons, introns and promoter regions.

**Keywords:** HLA\**A*; HLA\**B*; HLA\**C*; HLA\**DQB1*; HLA\**DRB1*; NGS;

### ABBREVIATIONS

HLA Human Leukocyte Antigen

NGS Next-generation Sequencing

IMGT international ImMunoGeneTics information system

Since the advent of next generation sequencing (NGS) and subsequent technical up-gradations, there has been a remarkable progress in diagnostic, prognostic and therapeutic aspects of malignant and non-malignant hematological diseases.

(1) With high polymorphism reported in the HLA Class I and II loci, allele level HLA typing at multiple loci has provided more accurate HLA matching for patients requiring bone marrow transplantation.

(2) The high throughput next generation sequencing (NGS) allows identification and characterization of multiple HLA alleles.

(3) At Marrow Donor Registry (India), we have a pool of over 40000 voluntary donors. Since January 2018, we have typed the HLA (high resolution) for 1152 voluntary donors and have identified 15 novel alleles from both HLA class I and class II genes. These alleles have been reported to the GenBank (NCBI) database (May 2018). With more than 13000 HLA alleles already identified, and many more alleles being characterized, probability of finding donor matches increases. (3, 4, 5)

All the HLA alleles were genotyped at HLA laboratory at MDR(I), Mumbai using NGS method. HLA locus-specific amplification was carried out using NGSgo-AmpX 384 high throughput kit from GENDX (The Netherlands). Next Generation Sequencing using targeted sequencing of full length HLA amplicon was done by Single Molecule, Real Time (SMRT) Technology on Sequel sequencing platform (Pacific Biosciences, USA). The most homologous equivalents were identified using NGSengine® V2.9.0.10411 (GenDX, The Netherlands).

Analysis revealed 4 new alleles in HLA-A, 2 in HLA-B, 6 in HLA-C, 1 in HLA-DRB1 and 2 in HLA-DQB1 genes. Among the 15 (novel) identified sequences, 10 sequences had single nucleotide mutation with one of the mutations seen in the promoter region whereas the other 9 mutations were found in exons. One sequence each from HLA-A, -B and -C had single nucleotide mutation at multiple sites. 3 synonymous and 12 non-synonymous mutations were identified. The only novel allele in DRB1 gene had 3 point mutations, all in Exon 3. All mutations in HLA Class 1 were identified in the Exon 1, while the mutations in Introns were distributed through Intron 2, 8 and 17. [Table 1]

The HLA-B homozygous allele B\*13:01:01:01v1var had synonymous mutation at 276 position. The other 2 synonymous mutations were seen in the HLA-DRB1 allele DRB1:01:01:01 at position 152 and 179 in Exon 3. The single nucleotide non-synonymous mutation in Exon 1 of HLA-C [C\*03:02 var] and HLA-DQB1 Exon 1 mutation DQB1\*06:03:01:01 were found in 4 donors each. While the non-synonymous [C\*12var] Exon 1 mutation in HLA-C was seen in 3 donors. [Table 1]

Through the use of NGS technology we at MDR(I) aim for a faster and accurate identification of novel alleles in the highly diverse Indian population which has remained largely untested and under reported in western registries.

HLA Locus	New Allele	MostHomologous Allele	Region	CodonChange	AMINO ACIDChange	Type ofMutation	Accession Number	Carrier Frequency
A	A*02var	A*02:11:01	EXN 1	<u>CAG</u> >> <u>CGG</u>	Q219R	NoSy	MH325442	01
A	A*24var	A*24:387	EXN 1; INT 2	<u>CAC</u> >> <u>CAG</u>	H70Q	NoSy	MH325437	01
A	A*33 extended	A*33:10	EXN 1	<u>AAG</u> >> <u>AGG</u>	K186R	NoSy	MH325440	01
A	A*33var	A*33:03:01:02	EXN 1	Promoter			MH325443	01
B	B*13:01:01:01v1var	B*13:01:01:01:02	EXN 1; INT 17	<u>CCG</u> >> <u>CCA</u>	P276P	Syn	MH325434	01
B	B*40var	B*40:01:02:01	EXN 1	<u>GAG</u> >> <u>GTG</u>	E152V	NoSy	MH325441	01
C	C*03:02 var	C*03:02:02:01	EXN 1	<u>CUG</u> >> <u>CTG</u>	L-8P	NoSy	MH325439	04
C	C*04var	C*04:03:01	EXN 1	<u>CAG</u> >> <u>CGG</u>	Q79R	NoSy	MH325430	01
C	C*12var	C*12:02:02:01	EXN 1	<u>CAG</u> >> <u>GAG</u>	Q177E	NoSy	MH325432	03
C	C*16var	C*16:02:01	EXN 1	<u>GAG</u> >> <u>GCG</u>	E152A	NoSy	MH325433	01
C1	C*07var	C*07:02:01:01	EXN 1; INT 8	INTRONIC	INTRONIC	NoSy	MH325430	01
C2	C*04:01:01:01	C*04:01:01:10	EXN 1; INT 8	Promoter			MH325431	01
DRB1	DRB1:01:01:01	DRB1*14:54:01:01	EXN 3	<u>GAC</u> >> <u>GAT</u>	D152D	Syn	MH325435	01
				<u>AGC</u> >> <u>AGT</u>	S179S	Syn		
				<u>GTG</u> >> <u>CT</u> — G —	V180L	NoSy		
DQB1	DQB1*06:03:01:01	DQB1*06:03:01:02	EXN 1	<u>GAA</u> >> <u>GGA</u>	E168G	NoSy	MH325436	04
DQB1	DQB1*06:01:08var	DQB1*06:01:08	EXN 4	<u>ACT</u> >> <u>GAT</u>	T57D	NoSy	MH325438	01

Table 1: Description of 15 new HLA alleles and their nucleotide variations with GeneBank accession Numbers

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## A Study of the Growing Rate Digital Dementia and its Impacts on the Health of the Current and Future Generation

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### ABSTRACT

*There was a hoarding which reads “apple and blackberries were better when they were only fruits”. I paused for a moment to let this sink in me. There are more than just apples and blackberries available now and the phone which was an instrument which was used to connect people, families is now isolating them. The mobile phone has undergone spectacular evolution from connecting people to classroom learning. One can speak, chat, check Facebook, Twitter & a lot more also to grow academically. We now tend to use our phone not when it rings but we feel to have a look at it and wish to check the likes received on our posts, to see if anyone has made a comment on our posts. The moment from when we are awake to the moment, we sleep we are jacked into this environment of virtual reality due to digital media. Do we know and realize how does this affect all of us on our physical and mental health? In this Paper, the research scholar intends to present, how technology is responsible for killing our functional brain cells due to its overuse. Are we pleased and ready to give our next generation assassinated brain cell potential?*

*Key words: Digital Dementia, Virtual Reality, MR Generation.*

*“We’ve all got Digital Dementia. Our smartphones have made us more stupid. We have become very comfortable with technology but very uncomfortable with people”*

### Life Coach Shiv Khera, October 7<sup>th</sup> Mumbai Mirror

Every academic field in the current education system is increasingly linked with technology and computers. The basic to advance learning and practical implication of knowledge has been enhanced with technology. With the change in technology gadgets like mobile phones are easily available and advanced usage mobile phone which has undergone spectacular evolution from connecting people to classroom learning. One can speak, chat, check Facebook, Twitter & a lot more also to grow academically. We now tend to use our phone not when it rings but we feel to have a look at it and wish to check the likes received on our posts, to see if anyone has made a comment on our posts. The moment from when we are awake in the morning to the moment, we sleep we are jacked into this environment of virtual reality due to digital media. The 21<sup>st</sup> century lifestyle knowingly or unknowingly is directly unconventionally coupled with technology. Do we know and realize how does this affect all of us on our physical and mental health? In this Paper, the research scholar intends to present, how technology is responsible for killing our functional brain cells due to its overuse. The paper seeks attention for growing MR generation.

Adults who have had too much screen time, youngsters engrossed with their entertainment system, or even children who toy around with their parents’ mobile devices are all at similar risk of developing digital dementia.

### OBJECTS OF STUDY

- What is Digital Dementia
- What are the impacts of Digital Dementia on the next Generation?
- Researchers intended to pursue how does digital dementia affect us.
- Is it or Is it not going to decrease Employability?
- Are there any possible ways of dropping the degree of impact of technology?
- How to prevent digital dementia from impacting?

## FUNCTIONAL DEFINITION

- Digital dementia is a term first coined by the neuroscientist Manfred Spitzer in his 2012 book. It was a term used to describe how overuse of digital technology relates to the breakdown of your cognitive abilities.
- Digital dementia is the deterioration of cognitive abilities due to overuse of technology. The type of cognitive breakdown found in the brains of individuals who overuse technology can also be found in individuals who have suffered severe head trauma or psychiatric diagnosis.
- This corrosion of cognitive function is attributed to the neglect of functional human brain development and over-reliance on technology.

## REVIEW OF LITERATURE

- An article published in Psychology about digital overuse explores neuroscientist Spitzer's proposal that "short-term memory pathways will start to deteriorate from underuse if we overuse technology." The negative cognitive effects of using too much technology include increased rates of ADHD, autism spectrum disorders, developmental delay, anxiety, learning disorders, and sleep disorders. Not only that the article discusses a study of video gamers and non-video gamers that found a link between heavy video game use and a reduction of grey matter in the hippocampus, the part of the brain related to our spatial cognition.
- **A Kaiser Foundation** Study found that elementary age children averaged 7.5 hours a day using entertainment technology. 75% of these children have televisions in their bedrooms, 50% of household have a TV on in their house all day, 68% of 2-year-old regularly use tablets, 59% have a smartphone, and 44% have a video game console
- **In another study**, close to 50% of parents surveyed said they use technology of some sort to keep children age 0-3 entertained. 1.8 billion people in the world own smartphones and use them daily. In the UK, 70% of 11-12-year-old use cell phones, and that number increases to 90% by age 14. 25% of children age 2-5 have a smartphone. The survey presented the average smartphone user checks their phone 150 times a day.
- Spritzer and other researchers have demonstrated the following adverse effects of technology overuse: Sensory deficits from the lack of movement associated with the sedentary nature of technology use. Postural changes associated with technology use including forward head posture (tech neck) with slouched shoulders and back leading to headaches, neck pain and low back pain. Increased rates of ADHD, autism spectrum disorders, developmental delay, anxiety, learning disorders, sleep disorders, and other behavioral disorders in children due to the overstimulation of auditory and vestibular pathways. Significantly decreased physical activity levels contributing to childhood and adult obesity. 2-3 hours daily of active play has been shown to be critical for normal brain development in children. Video games and violence on TV have been shown to significantly increase sympathetic activity ("fight/flight" response) in children and adults leading to anxiety and depression disorders.
- Brain researchers have now identified what they are calling internet addiction disorder. Research by Kimberly Young and others have demonstrated that there can be significant negative brain changes associated with excessive time spent on the internet. These changes are associated with excessive dopamine stimulation via the reward and pleasure centers in the brain. These are the same pathways activated by certain drugs such as cocaine, opiates, and methamphetamines.

## IMPACT DIGITAL DEMENTIA ON HUMAN HEALTH

- As the technology has become integral part of our day to day living, Parents and children are spending more time with electronic gadgets than ever before. During their personal interactions among themselves also they are mostly seen on TV, Computer and Mobiles. On an average, adults spend daily seven to eight hours using digital technology, somehow or the other (TV, Computers, Mobile phones).
- This means that each day, adults spend one hour more with the digital technology than they spend in sleeping. Although basic science pronounces that brain needs sleep for its muscular energy to be recharged, it's threatening to discover that more time is being given to technological devices than the restorative function of basic human sleep. Furthermore, concerning is the fact that around 82 percent of smartphone users always admit being having their phones put up on, including those insignificant hours that they are in sleep. Observing the unimaginable amount of time spent on smartphones, tablets, television, and computer screens, it's crucial to understand the possible health implications associated with digital technology. Since

the growth and development of human brain was not designed to deal with such vast amounts of digitization, overuse can cause significant cognitive deterioration.

- Short-term memory problems and decreased attention span are just a few symptoms associated with a condition neuroscientist have called digital dementia.
- As technology users increasingly rely more on their phones and less on their brains for simple calculations, dates, mental alarms and to do things, the entire development of the brain becomes unbalanced. As per the left-hand side brain & right-hand side brain theory, while use of technology may promote the development of the left side of the brain in the form of linear and rational thinking, whereas the right side of the brain is completely ignored and bargained. The emotional, perceptive, and resourceful right side of the brain becomes stagnated, undernourished & undersized, leading to problems with short-term memory, attention span, and the ability to concentrate and regulate emotions. But the reality is for most of the people, it may not be simple or possible to avoid technology altogether, nor is it recommended in this world of robot supplies. The truth is that technology typically won't harm a healthy brain, which is why it's important to maintain good brain health.

## IMPACT DIGITAL DEMENTIA ON THE NEXT GENERATION

1. The use of smartphones stimulates the left side of the brain, while the right side, which is linked with concentration, remains untapped and eventually degenerates. Forgetfulness has surged, as users rely heavily on their smartphones to remember even the slightest bit of information for them.
2. Because search engines allow information to be easily accessed, users are more likely to remember where to find a fact instead of remembering the fact itself.
3. Additionally, information on the internet is presented in hypertexts that allow users to scan documents superficially, resulting in poor memory recall.
4. On the other hand, gadgets aid our memory by storing data externally, thereby freeing capacity in our long-term memory.
5. The environment of social media has given rise to a pandemic of internet addiction, and its use can evoke a psychophysiological state characterized by high positive valence and arousal.
6. The internet is a realm of knowledge and opportunities that provides a platform where people from across the world can connect and exchange ideas and services. However, the peril of technology far outweighs its benefits. Teenagers have become great multitaskers; the interruption of their study time through interaction with technologic devices has resulted in poor academic progress for some.
7. Children and adolescents are a high-risk population because of their massive technologic reliance while their brain maturation is ongoing.

## SOLUTIONS TO THE PROBLEM

Fortunately the scientists, neurologists, psychologists and educationists are at consensus that the technology needs not be discarded from this generation so agree to suggest the following steps that can be taken to exercise the brain and help prevent and treat symptoms associated with digital dementia:

- **Consolidated regular Brain Exercise:** Children have forgotten now a days Playing memory cards. Probably some of them wouldn't be knowing the names of cards, clubs, diamonds, hearts and spades. Chess is another option for improving visual learning. Playing simple memory games can work to rebalance the left and right sides of the brain provided the games are played originally on the boards not on the screens.
- **Outdoor Physical Exercise:** Walks, jogging, yoga, cycling, swimming and skating has become aliens to the 21<sup>st</sup> century children. For the most part, individuals who overuse technology also spend a lot of time only sitting down. Any exercise that increases the heart rate will also increase blood flow to the brain, promoting the transport of vital nutrients and improving brain function. Immediate attention should be paid for better lifestyle to avoid displeasing consequences.
- **Avoiding digital Reading:** Digital book reading at all levels of education from elementary to university is becoming trendy at the cost of health. Reading a physical book, rather than words on a screen is a great way

to exercise the brain and also to get connected the visible and invisible characters of the book. Reading has been shown to improve both memory retention and attention span.

- **Learning a Language:** India is country of languages and versatile culture. An attempt to learn a new language is an incredibly thought-provoking cognitive exercise. It requires immense attentiveness, constant concentration and cognitive function, both of which are beneficial to the brain cells and its blending of memory permutations and combinations.
- **Enjoying hobbies and Playing an Instrument:** Music not only fills one's life but also develops life skills. Playing an instrument requires the use of both sides of the brain, which helps create the balance that is often damaged from the overuse of technology. Ensure there are times of the day that we are living technology free.
- **Limiting the Screen Time:** The suggested screen time for children of all ages should be limited to two hours a day and no TV or digital entertainment should be permitted for children under the age of two. Homes should have "screen-free zones", especially in bedrooms.
- **Use your Head Instead of Relying on Digital Devices.** When possible for calculations, memorable words, directions, try to think for yourself instead of relying on your computer to do the thinking GPS for you.

### **Summary of Functional precautions for avoiding Digital Dementia for younger generation**

Teachers' parents' counselors need to keep in mind how students learn differently as they grow in age and mature socially, emotionally and cognitively.

Suggest them

- **Read a Real Book, not a Kindle** as electromagnetic fields which can promote electronic dementia.
- **Interact with Real Life not with virtual friend.** Children need to spend most of their time interacting with real people and real life instead of the creative imaginations.
- Cultivate culture of newspapers, board games and books
- TVs should be turned off during meals to foster family time interaction
- **Exploring the outdoors**, reading, playing an instrument or a board game are all technology-free activities that can be used to give the brain a much-needed break. Much like the body, the brain requires exercise, and if it's being challenged and stressed, it will continue to function properly.
- Maintain a life without overusing technology keeping factors of digital dementia in mind.

### **Consider the five below**

1. Ideally, we should use digital devices for no more than 3 hours per day. Begin with selecting one day to achieve this goal, like Saturday or Sunday.
2. Take regular breaks to get up and move around. This will help your brain rest and create gaps between your prolonged usage.
3. It is important to maintain a normal posture when on your digital screens, especially when on them for prolonged periods of time. Looking down at the device changes the resting state of the brain, which is associated with the decreased levels of senses & alertness.
4. Develop a habit of more physical exercise to improve your brain's sharpness. Focus on your social, emotional, memory and cognitive functions,
5. Let us develop a habit of shutting down the Wi Fi modem and router before sleeping, when there is no reason to have the radiation continuously reaching you when you're not even using the electronic devices

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- <https://www.telegraph.co.uk/news/worldnews/asia/southkorea/>
- <http://netaddiction.com/kimberly-young/> (Kimberly Young)

## A Study on Mobile Cloud Computing for Healthcare Applications

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### **ABSTRACT**

Nowadays Mobile phones are being used extensively by people in their day to day activities. Mobile cloud computing (MCC) is a potential technology for mobile web services which integrates mobile and cloud computing. Mobile cloud computing is likely to be the heart of healthcare transformation. It offers various services and facilities to patients. Mobile devices allow patients to access healthcare services anywhere at any time. This paper gives an overview of mobile cloud computing for healthcare applications. Various methods of mobile cloud computing in healthcare application are reviewed. Mobile cloud-computing infrastructure to be used for healthcare applications is described. This paper also demonstrates the process of deployment of Mobile cloud computing in various healthcare applications. General architecture and design consideration of MCC for healthcare scenarios are explained. Security and privacy issues of Mobile Cloud Computing in healthcare applications are also discussed. Conclusions are drawn concerning the design of networked healthcare systems using mobile cloud-computing technologies.

**Keywords:** Cloud Computing, Mobile Cloud Computing, Healthcare applications, Mobile Devices, Security and Privacy.

### **47. INTRODUCTION**

Mobile Cloud Computing (MCC) is an integration of Cloud Computing into the applications of mobile devices. MCC has been widely known as a promising approach for next-generation healthcare solutions. MCC healthcare system was built to capture and analyse real time biomedical signals, like blood pressure and ECG from users in several locations. On the mobile devices, a customized healthcare application is installed, and health data are synchronized into the healthcare cloud computing services for storage and processing. There are many mobile applications available which will act as sensors for these health care applications. People can check their heartbeats, blood pressure, etc through mobile devices.

Vital signs and physiological signals collected from networks can be transmitted to cloud using mobile phones. Depending on the patient's condition, MCC generates the healthcare data analysis results, which could either trigger the alarm to doctor or be stored in the medical database. MCC provides the platform that enables users to share, transmit, and process Electronic Health Record. MCC-based healthcare systems have been widely deployed for physiological data analysis and telemonitoring.

MCC offers significant benefits to healthcare solution such as:

- MCC model can improve access to computing, sharing of information, cloud-based medical records and reduce costs.
- MCC will remove the barriers for modernization and innovation of healthcare applications.
- Several patients can utilize the healthcare applications.
- Remote access of applications and data provides functionality for managing information in distributed applications.

This paper is a study on mobile cloud computing in healthcare application. In this review study, we have provided an overview of the mobile healthcare service technologies. This paper is organized as follows. At first, we started with an introduction in Section 1, subsequently Section 2 provides details of various mobile cloud architectures used for healthcare applications. Section 3 describes mobile cloud computing and storage for healthcare. Section 4 explain various MCC based healthcare applications. Section 5 discusses the security and privacy issues in mobile cloud healthcare and section 6 includes the conclusion.

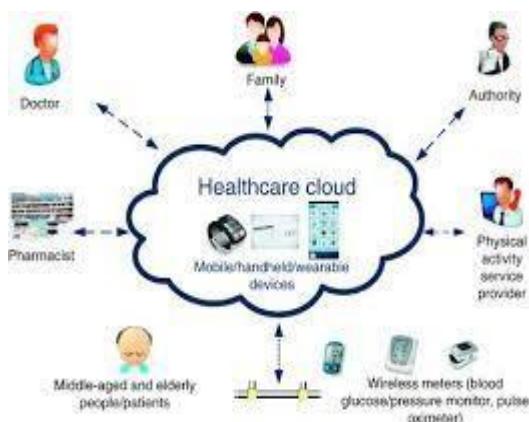


Fig. 1: Mobile Cloud Computing for Healthcare

## 48. MOBILE CLOUD HEALTHCARE ARCHITECTURES

Mobile cloud healthcare architectures can be divided into three parts: cloud computing facilities, sensors and mobile devices and communication networks.

### 2.1 CLOUD COMPUTING

Cloud computing allows the access of the stored information from anywhere at any time and can be used to enhance productivity, increase performance and reduce the cost and complexity. Mobile Cloud Computing is the integration of mobile devices with cloud computing to utilize the unlimited service provided by the cloud through the mobile device. Cloud computing becomes an indispensable part in MCC, due to its superior computational capability, elasticity and scalability.

### 2.2 SENSORS AND MOBILE DEVICES

Sensors and mobile devices are a significant part in the mobile cloud computing paradigm. The effective coordination between sensors and mobile devices could efficiently improve the performance of mobile cloud systems. Because of the limited battery life and restricted processing capability in both sensors and mobile devices, a lot of different approaches have been explored towards energy saving and efficient data processing. A mobile cloud system coordinates with Wireless Sensor Networks to provide diversified services to users based on their locations. Wireless Sensor Networks were wakening in an optimized way so that they could respond to requests from mobile devices in a reliable and energy-saving manner.

### 2.3 COMMUNICATION NETWORK

The communication networks are used to connect mobile devices to cloud servers. Performance of MCC depends on the speed and quality of network communications. To overcome the limitations of traditional mobile cloud sensing, 5G network coupled with the analysis of big data can be used. Big data analysis has the ability of processing large scale data compared with traditional servers. Bandwidth constraint of previous network infrastructures can be solved by 5G network. It supports the massive data capacity and massive connection request in the new mobile cloud sensing era.

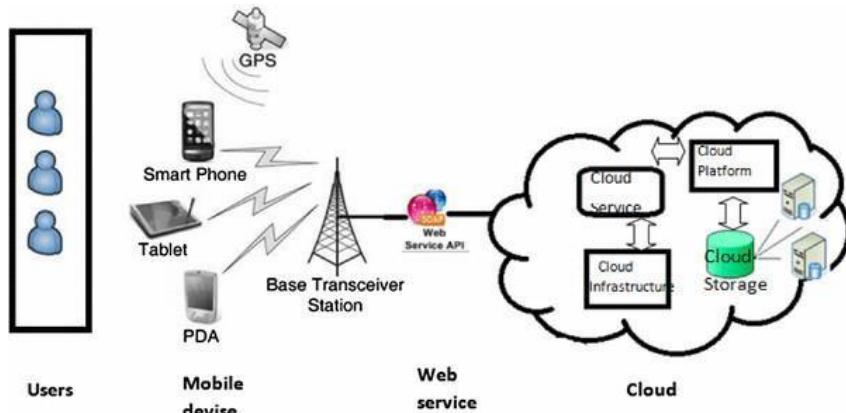


Fig. 2: Mobile Cloud Computing Architecture

## 49. MOBILE CLOUD COMPUTING AND STORAGE FOR HEALTHCARE

### 3.1 Mobile Cloud Computing for Healthcare

MCC has significantly evolved and expanded over the time. MCC implements a code offloading strategy from mobile to cloud for data transmission. MCC system involves multiple-level resources as the computation offloading destination. MCC has been greatly leveraged for many clinical diagnosis and prognosis. Through migrating the computationally intensive training procedures to the cloud, Machine learning algorithm based on MCC approach has been proposed for accurate and sustainable ECG telemonitoring.

### 3.2 Mobile Cloud Storage for Healthcare

Mobile cloud is used to provide storage services that has appeared in different application scenarios. Different approaches have been introduced which leveraged cloud resources to augment mobile storage. Various issues regarding mobile cloud storage have been investigated, such as power consumption, data interoperability, security and privacy. Mobile Cloud storage systems have been used widely on a large scale to facilitate healthcare services. It also helps to manage patient health records and medical images effectively. It is used to maintain personal health record management like EHR, EMR etc.

### 3.3 Hybrid Mobile Cloud Computing and Storage for Healthcare

Some application utilises both mobile cloud computing and storage for healthcare. A dynamic application partition scheme has been designed for both mobile cloud computing and storage scenarios. Data stream applications can be deployed on the mobile cloud infrastructure with large throughputs. Many healthcare services have also taken advantage of both the computational ability and the storage capacity of mobile cloud infrastructure.

## 50. MOBILE CLOUD HEALTHCARE APPLICATIONS

MCC based healthcare applications can be categorized into the following groups: Electronic Health Record, Picture Archiving and Communication Systems, Telemonitoring and Bio signal Processing, and Multi-agent Medical Consultation.

### 4.1 Electronic Health Record (EHR)

An Electronic Health Record (EHR) is an organized collection of health information of patient and population in an electronic digital format. EHR is a digital version of a patient's medical history maintained over a time period. It includes set of information, such as vital signs, medical history, health problems, medications, immunizations, allergies, progress notes and laboratory report etc. *EHRs* make the information available instantly and securely to authorized users. The EHR also has the ability to support other care-related activities like evidence-based decision support, quality management, and outcomes reporting, through various interfaces. MCC has been widely used as one of the EHR deployment methods.

### 4.2 Picture Archiving and Communication Systems (PACS)

**Picture archiving and communication system (PACS)** is a medical imaging technology which is used to securely store and digitally transmit electronic images and clinically-relevant reports in healthcare organizations. MCC approach has been broadly adopted for the implementation of PACS. Medical imaging storage technologies like PACS are very important because the volume of digital medical images grows throughout the healthcare industry and data analytics of these images becomes more prevalent. This technology provides economical storage and convenient access to images from multiple modalities like radiographs, CT, MR, ultrasound etc simultaneously at multiple locations within hospitals or across the globe.

### 4.3 Telemonitoring and Biosignal Processing

Medical telemonitoring and Biosignal processing is a technique which leverages the information analysis and communication methodology to provide healthcare services at distance. Telemonitoring of body dynamics through daily activities has become a life-style choice for consumers, because it helps them to keep track of parameters like calories burnt, activity levels, food intake, or calling the nearby health care facility during emergencies. Telemonitoring is one of the most effective solutions that can improve healthcare efficiency and reduce medical costs.

### 4.4 Multi-Agent Medical Consultation

Multi-agent approach is extremely effective to deal with the complexities of healthcare system. Multiple agents like doctors, nurses and other medical practitioners, may coordinate with each other in order to deliver high-quality healthcare services. MCC has been utilized to provide such multi-agent medical consultation services.

Multi-agent mobile cloud system is designed to enable doctors, nurses and other medical staff to cooperate efficiently with each other in healthcare service provision.

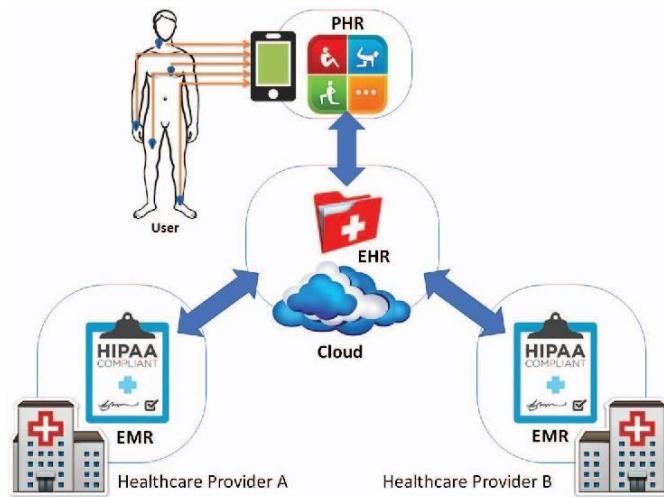


Fig.3: Mobile Cloud Healthcare Applications

## 51. SECURITY AND PRIVACY IN MOBILE CLOUD HEALTHCARE

As more and more users have relied on Mobile Cloud Computing services in their daily lives, serious concerns about the privacy and security issues for MCC in the healthcare domain have given the significance. Many efforts have been taken to address the privacy and security threats and towards the sensitivity of medical data and treatment procedures.

### Mobile Cloud Security and Privacy Threats and Issues

- Information theft and data integrity breakage
- Privacy leakage and breaches
- Insecure data access and processing
- Insider Attack
- Time and location based mobile attack
- Unauthorized access to EHR
- Insecure mobile software execution environment and data communication
- Sniffing, Spoofing, Eavesdropping attack
- Privacy of medical image transmission
- Malicious attacks
- Anonymous data authentication for MHR

### Some solutions to address these issues

- Secure electronic medical records uploading and sharing
- Secure personal health information transmission
- Use of Cryptography based authentication
- Use of Encryption methods
- Use of secure system to protect users' privacy and anonymity
- Online/Offline EHR access control mechanism
- Use of Cloud based security as a Service (SaaS) for mobile health security

- Create secure channel for communication
- Outsourcing images to cloud for selective encryption
- Authentication and secure access control
- Detection of misbehavior for health mobile social network
- Privacy preserving health data aggregation

## 52. CONCLUSION

Mobile cloud computing plays an important role in the modern healthcare applications. This study provides an overview of mobile cloud computing techniques extensively used and deployed in the healthcare applications. In this paper, we have covered the popular healthcare services that have been largely benefited from the emerging MCC technology. This review study also gives detail about the general architecture and design considerations, one should take into account while designing an MCC for healthcare scenarios. Finally, the security and privacy issues of MCC in healthcare, as well as some representative solutions, have been discussed. This work will pave the way for future research on applying mobile cloud computing to provide effective healthcare services. The summarization also brings up more attention to the potential opportunities of how MCC could be further developed, utilized and expanded in healthcare.

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## The Relationship between Job Satisfaction and Turnover Intention: A Study on Nurses in Government Hospitals in Mumbai

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### **ABSTRACT**

*The central aim of this paper was to determine the effect of job satisfaction on Turnover intention among nurses in Mumbai. The main objective of this study was to analysis the impact and relationship of satisfaction with supervision, Job Variety, Compensation Level, Policies as the four facets of job satisfaction that affect employee turnover intention. For the purpose of study, the data was collected from 120 nurses working in different government hospitals of Mumbai Social implications – According to Economic Times Survey India Facing shortage of 2 Million Nurses in India. Shortage of nurses is also seen in many other countries, which has negative consequences for high-quality nursing care and costs of the healthcare system. Thus, the results of the present study suggest ways in which nurse retention could be improved in the hospital. The findings show that nurses experiencing high levels of job satisfaction are likely to report lower intentions to leave their profession.*

*Keyword: Job Satisfaction, Turnover Intension, Nurses, Government hospital*

### **INTRODUCTION:**

Nurses in the medical staff are the most valued employees of the medical institution. They are the one who takes care of our closed one in the hospital. Hence, job satisfaction plays a major role for nurses. Nurses intention to leave the organization creates a negative impact on the Medical institution. In order to over come such problem, the employer should give their employee a better opportunity so that they can excel in their field. Different authors have different approaches to job satisfaction. Vroom (1964) focuses on the role of the employee in the workplace. Thus, he defines “job satisfaction as affective orientations on the part of individuals toward work roles which they are presently occupying.” Dessler (1978:37) refers to job satisfaction, „as the degree of needs satisfaction that is derived from and or experienced on the job”. According to Saeed, I., Waseem, M., Sikander, S., & Rizwan, M. (2014) Turnover is one of the painful issues in the organization. They concluded that the Job satisfaction, job performance and leader membership exchange has a direct negative influence on the turnover intention

### **SIGNIFICANCE OF STUDY**

This study will measure job satisfaction and its relationship with turnover intention in the health sector which includes the nursing staff of different hospitals operating in Mumbai i.e from Wadia, Tata Memorial hospital, KEM Hospital, Sion Hospital, J J Hospital etc. Many of these types of researches have been conducted in different countries around the world but in India very few researches are made on measuring satisfaction with job and its impact on intention to leave. This study helps the policy makers and managers of hospitals to determine the needs of nurses. Another important aspect of this study is that this study is conducted in a country where most of the people belong to lower income level. This study is also helpful for the managers of the hospitals to train new nursing staff.

### **LITERATURE REVIEW**

Alam, M. M., & Muhammad, J. F. (2010). in the research stated that all the five parameters i.e. satisfaction with co-worker, compensation, HR policies, supervisor, & job Variety have direct relation with the intention to leave . Further research was conducted by Alam, A., & Asim, M. (2019), on nurses in Karachi and concluded in their research that task clarity has significant impact on turnover intension where in whereas Satisfaction with Organizational Policies and Strategies, Satisfaction with Career Development, Satisfaction with Supervision, Satisfaction with Compensation Levels have insignificant effect on Turnover intention. Mbah, S. E., & Ikemefuna, C. O. (2012) stated that the higher job satisfaction reduces the turnover intention. They further added that if there is less supervision, more clarity of role, more autonomy, self approaches etc reduces the rate

of turn over intention. One more study states that the turnover intention are not significantly associated with turnover intention wherein other job related factors of job satisfaction i.e. compensation, supervision, career future, co-worker etc affect turn over intention Hian Chye Koh & Chye Tee Goh (1995). Additionally, future research was conducted by Kalliath, T., & Morris, R. (2002) and concluded that job satisfaction has a negative effect on emotional exhaustion

Future research was carried out by Lu, K. Y., Lin, P. L., Wu, C. M., Hsieh, Y. L., & Chang, Y. Y. (2002). and they conducted a research to understand the relationship among turnover intention, Professional Commitment & Job satisfaction of nurses and concluded that there is a strong correlation between all the variables whereas there is a negative correlation between job satisfaction & turnover intention. Yücel, İ. (2012). In his study examined the relationship between job satisfaction, organizational commitment and turnover intention. The results indicated that the higher the level of Job satisfaction leads to higher organizational commitment and lower turnover intention

## OBJECTIVES

- 1: To analysis the relationship among Job satisfaction with supervision, Job Variety, Compensation Level, Policies and Intension to Leave
- 2: To examine the relationship among Job satisfaction with supervision, Job Variety, Compensation Level, Policies on Intension to Leave.

## HYPOTHESIS

- $H_{11}$ : There is a Significant Relationship between Satisfaction with supervision and turnover intention
- $H_{12}$ : There is a Significant Relationship between Satisfaction with Compensation and turnover intention
- $H_{13}$ : There is a Significant Relationship between Satisfaction with Job Variety and turnover intention
- $H_{14}$ : There is a Significant Relationship between Satisfaction with Policies and turnover intention
- $H_{15}$ : There is a Significant Impact of Satisfaction with supervision, Compensation, Job variety & Policies on turnover intention

## INSTRUMENTATION DEVELOPMENT

Variables	Item	Source
Turnover intension (Dependent Variable)	3	(Alam & Muhammad, 2010)
Satisfaction with Supervision (Independent Variable)	4	(Alam & Muhammad, 2010)
Satisfaction with Compensation (Independent Variable)	4	(Alam & Muhammad, 2010)
Satisfaction with Job Variety (Independent Variable)	6	(Alam & Muhammad, 2010)
Satisfaction with Policies (Independent Variable)	4	(Alam & Muhammad, 2010)

(The data was analysed on 5 point Likert Scale from Strongly Disagree to strongly Agree.)

## DATA ANALYSIS

Reliability Statistics	
Cronbach's Alpha	N of Items
.821	21

Cronbach's Alpha of the questionnaire is 0.82. The cronbach alpha value is more than 0.70 thus there is internal consistency in the questionnaire.

## CORRELATION ANALYSIS

		Combined_compensation	Combined_Supervision	Combined_policies	Combined_Job_Variety
Combined_TOI	Pearson Correlation	-.178	-.160	.365**	-.117
	Sig. (2-tailed)	.114	.157	.001	.299
	N	80	80	80	80

Factor	Hypothesis	P Value	Decision
TOI with compensation	$H_{01} : \rho_{(TOI, C)} = 0$ $H_{11} : \rho_{(TOI, C)} \neq 0$	0.114	Reject $H_1$ Accept $H_0$
TOI with Supervision	$H_{02} : \rho_{(TOI, S)} = 0$ $H_{12} : \rho_{(TOI, S)} \neq 0$	0.157	Reject $H_1$ Accept $H_0$
TOI with policy & HR Management	$H_{03} : \rho_{(TOI, P)} = 0$ $H_{13} : \rho_{(TOI, P)} \neq 0$	0.001	Reject $H_0$ Accept $H_1$
TOI with Job Variety	$H_{04} : \rho_{(TOI, V)} = 0$ $H_{14} : \rho_{(TOI, V)} \neq 0$	0.299	Reject $H_1$ Accept $H_0$

### TOI with Compensation

$H_{01}$ : There is no statistical relationship between turn over intention & Compensation

$H_{11}$ : There is statistical relationship between turn over intention & Compensation

P value is 0.114 which is greater than alpha value i.e 0.05. Hence, we Reject  $H_{11}$  and Accept  $H_{01}$

Thus, correlation is not statistically significant. There is no statistical relationship between turn over intention & Compensation

### TOI with Supervision

$H_{02}$ : There is no statistical relationship correlation between turn over intention & Supervision

$H_{12}$ : There is statistical relationship between turn over intention & Supervision

P value is 0.175 which is greater than alpha value i.e 0.05. Hence, we Reject  $H_{12}$  and Accept  $H_{02}$

Thus, correlation is not statistically significant. There is no statistical relationship correlation between turn over intention & Supervision

### TOI with HR Management & Policy

$H_{03}$ : There is no statistical correlation between turn over intention & HR Management & Policy

$H_{13}$ : There is a statistical correlation between turn over intention & HR management & policy

P value is 0.001 which is lesser than alpha value i.e 0.05. Hence, we Reject  $H_{03}$  and Accept  $H_{13}$

Thus, which is correlation is statistically significant. Thus, there is statistical correlation between turn over intention & HR management & policy

### TOI with Job Variety

$H_{04}$ : There is no statistical correlation between turn over intention & Job Variety

$H_{14}$ : There is statistical correlation between turn over intention & Job Variety

P value is 0.299 which is greater than alpha value i.e 0.05. Hence, we Reject  $H_{14}$  and Accept  $H_{04}$

Thus, correlation is not statistically significant. Thus, there is no statistical relationship between turn over intention & Job Variety

## REGRESSION ANALYSIS

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.552 <sup>a</sup>	.305	.268	1.73052

a. Predictors: (Constant), Combined\_Job\_Variety, Combined\_compensation, Combined\_policies, Combined\_Supervision

Since the R square is 0.305 that means 30% variance in Dependent variable is explained by the independent variable. Since the R square is less than 60% hence it is not statistically significant.

## AVONA

ANOVA <sup>a</sup>					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4	24.650	8.231	.000 <sup>b</sup>
	Residual	75	2.995		
	Total	79			

a. Dependent Variable: Combined\_TOI

b. Predictors: (Constant), Combined\_Job\_Variety, Combined\_compensation, Combined\_policies, Combined\_Supervision

Sig Value is 0.000. Since 0.000 is less than alpha value i.e 0.05 thus, we Reject Ho and Accept H1 i.e Model is Statistically Significant at 95% level of confidence

## CO-EFFICIENT MODEL

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.138	2.357		2.604	.011
	Combined_policies	.697	.131	.642	5.314	.000
	Combined_Supervision	-.058	.175	-.044	-.335	.739
	Combined_compensation	-.079	.114	-.081	-.691	.492
	Combined_Job_Variety	-.250	.104	-.416	-2.412	.018

a. Dependent Variable: Combined\_TOI

TOI = a = Constant i.e 6.138

TOI = 6.138 + 0.697(Comined\_Policies) – 0.058(Combined\_supervision) – 0.079(Combines \_Compensation) – 0.250(Combined\_Job Variety)

Thus, we can conclude that, if increase in policies is by 1 unit than the increase in Turnover Intention is 0.697. If the other variables i.e supervision is decreased by 1 unit then TOI will decrease by 0.058, compensation is decreased by 1 unit then TOI will decrease by .079 & job variety is decreased by 1 unit then Turnover intension will get decreased by 0.250

## SIG VALUE

Policies = 0.000, Supervision is 0.739, Compensation = 0.492 & Job Variety – 0.018

Since Policies sig value is less. Thus, Policies variable is statistically significant & is the most influencing factor.

## CONCLUSION

Thus, from the above we can conclude that the it is important for the management to explain the clear path to the staff. Also, the management needs to be extremely careful and fair while framing the Personal policy of the organization. Decision should also be made by keeping the nurses in mind. The management should encourage participatory decision making. Hence, it is concluded from the result of the correlation that the other 3 facets for job satisfaction i.e Compensation, Job variety, & supervision does not affect turn over intension as there is no statistically correlation between them. Also, it is proved by using regression analysis that satisfaction with HR management & policies is the most influencing factor that affects Turn Over intension.

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## A Study on Preventive Measures on Non-Communicable Diseases in Georgia

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### ABSTRACT

*National center for disease control (NCDC) and general health, is a national organization of the nation of Georgia. The NCDC isn't just to convey reconnaissance of communicable diseases (CD) and non-communicable diseases (NCD) yet in addition investigates episodes of interest. This report depends on diseases prevailing in the nation of Georgia and results of it in present and future. The investigation likewise gives the information and discloses to us that a large portion of the deaths in Georgia are because of CDS.*

**Keywords:** Non-communicable disease, Cardiovascular diseases and Georgia

### 1. INTRODUCTION

Georgia has just 3.717 million inhabitants. With such a low populace and cleanliness in the nation the nation isn't influenced much by communicable diseases. Be that as it may, Georgia resembles the vast majority of the other nations in the world where the NCD are the major reasons for death which is determined as 94% of the absolute demise cause.

Cardiovascular diseases are the main sources of death in the nation. Diseases of the circulatory framework establish 15.5% of every single enlisted instance of disease in the nation. At present there are 30.7 cardiologist per 1,00,000 inhabitants

#### 1.1. HYPERTENSION

The portion of hypertension in Georgia establishes about 62% of all CVD (2015). In 2010, the NCDC with support of the WHO and EU directed the principal huge scale overview on the noncommunicable diseases chance factors (STEPS-2010). According to overviews information, about 34% of the populace experiences either high blood pressure or pre-hypertension

#### 1.2. CORONARY HEART DISEASE

Coronary illness establishes about 18% of all diseases of the circulatory framework: angina pectoris (6.8%); acute myocardial infarction (1.0%), other acute ischemic diseases (1.6%). In 2015, 55.8% of patients with acute myocardial infarction were admitted to clinic opportune (within the initial 24 hours from the beginning of indications).

#### 1.3. CEREBROVASCULAR DISEASE

Cerebrovascular diseases involved the third spot among diseases of the circulatory framework. Over the previous years the cerebrovascular diseases prevalence rate has followed an upward pattern.

### 2. REVIEW OF LITERATURE

- **Tamari Rukhadze. (2013)** The main point of this paper is to present the present measurements and circumstance of health care framework in Georgia; the adjustments in the change time frame within the general public and the health care framework. Additionally, presented are the efforts from the Government and the Ministry of Labor, Health and Social Affairs of Georgia in the method for various initiatives and activity in order to improve quality consideration of patients and sustain the health care framework. This paper portrayed the institutional framework, procedure, substance and execution of health and health care approaches in Georgia with regards to predictive, preventive and customized medicine.
- **Chanturidze T, Ugulava T, Durán A, Ensor T, Richardson E. (2009)** The Health Systems in Transition (HiT) profiles are nation-based reports that give a nitty gritty depiction of a health framework and of strategy initiatives in progress or being worked on. HiTs examine various ways to deal with the organization, financing and conveyance of health administrations and the job of the main actors in health frameworks; portray the institutional framework, procedure, substance and usage of health and health care arrangements; and highlight difficulties and zones that require more top to bottom investigation. This report

essentially centers around advancements after the Rose Revolution in 2003, which carried major change to the job of government in providing, financing and managing open administrations, including health care. About all health care suppliers are private actors, independent of the state. Much emergency clinic stock has been offered to private investors for redevelopment as present-day medical clinics. Mandatory social health insurance, introduced in the 1990s, has been relinquished and private health insurance is being advanced as the main component for the pre-installment of health benefits in Georgia. Private insurance inclusion for family units living underneath the neediness line is paid from open assets however all other individuals are required to buy spread alone initiative. Out-of-pocket installments remain the main wellspring of funding for the health framework in Georgia, which lessens access to administrations for a significant part of the populace, especially in access to pharmaceuticals. In general, health framework guideline is fairly feeble, especially when contrasted and the difficulties it faces.

### 3. RESEARCH METHODOLOGY

#### 3.1. PURPOSE OF THE RESEARCH

- Age-standardized prevalence of tobacco smoking among people 15 years and more established: 29.6 %, anyway there is a major sexual orientation distinction; 58% of the male populace is smoking rather than 6% among ladies. Liquor utilization adds up to 12.6 l/year for men and 3.4 l/year for ladies.
- Obesity ( $BMI \geq 30 \text{ kg/m}^2$ ) is more continuous in ladies (25.9%) than in men (17.9%), with a prevalence when all is said in done populace of 22.1%. The prevalence of diabetes (raised fasting blood glucose) is evaluated to be 15% of the populace without a sexual orientation distinction.
- In the age bunch over 18 years 29% of male and 24% of female have raised blood pressure. One in five Georgians are insufficiently physical dynamic.

#### 3.2. OBJECTIVES OF THE RESEARCH

- To understand the preventive measures regarding health provided by the Government of Georgia
- To know the impact of Non-communicable diseases on the Georgia people.

#### 3.3. METHODS OF DATA COLLECTION

- **Secondary data** is collected from Journals, Magazines, Newspapers and various Websites.

#### 3.4. RESEARCH DESIGN

The research design deployed was exploratory research design. It is descriptive in nature.

#### 3.5. LIMITATIONS OF THE RESEARCH

The research has physical, economical constraint and the data collected is secondary data.

#### 3.6. DATA ANALYSIS METHODS

Data is collected from various sources to know the exact statistical data to generalize the findings of the research study.

### 4. FINDINGS

- **CVD prevention in Georgia:** The Ministry of Labor, Health and Social Affairs of Georgia. The National Center for Disease Control and Public Health (NCDC) The Georgian Society of Cardiology (GSC) the Georgian association for CVD Prevention and the Rehabilitation (GACPARI) Georgian Heart Foundation Cardiovascular preventive care in Georgia is mainly conveyed both by family doctors and via cardiologists, who are utilized at the state medical administrations (emergency clinics, out-understanding clinics) and in private medical offices.
- **PCI RESOURCES:** In Georgia there are aggregate of 41 percutaneous coronary intervention (PCI) centers (26 in Tbilisi, 15 in regional centers. The quantity of PCI is 11 for each 1 million inhabitants with throughout the day around access to administrations.
- **Education:** There is one state medical university, 4 private medical colleges and medical resources in a few state and private colleges in Georgia. The various fields of cardiovascular prevention are instructed in instructive programs in medical institutions/colleges and postgraduate medical training. In any case, there are no different efforts to monitor and review CVD prevention on the national level. So far preventive cardiology is given by doctors just, no other profession gatherings (attendants, dietitians or physiotherapists) are locked in yet.

- **Guidance:** Guidance is obtained through the European Guidelines of CVD Prevention in Clinical Practice (ESC). They are presented in addresses, on meetings by the nations' leading researcher's cardiologists. The main parts of prevention, analysis and treatment are included in national CVD conventions of the Ministry of labor, Health and Social Affairs of Georgia.
- **Cardiac Rehabilitation Program:** The cardiac rehabilitation program at East Georgia Regional Medical Center is intended to improve the personal satisfaction for individuals who have encountered a cardiac occasion. The talented professionals in our group are uncommonly trained to help patients who are beginning the excursion towards a healthier way of life. They help rehabilitation patients regain their certainty while increasing generally speaking prosperity. Program members are offered assets to regain their capacity to come back to work and perform day by day exercises.
- **Non-communicable:** Non-communicable diseases make the best proportion of the complete weight of disease and injuries in Georgia affecting the most gainful long periods of life. According to WHO 2014 Health Report, non-communicable diseases represent about 94% all things considered, among them 69% due to CVDs, 14% to malignancy, 1% to diabetes and 4% to interminable respiratory diseases; they make influence on health as well as on the sustainable improvement of the nation. Among CVDs the greatest offer as far as mortality and morbidity falls on Hypertension (more than 50%) and tobacco. For the successful prevention and control of NCDs it is basic to have convenient access so precise and dependable information, to monitor and interpret health indicators, to monitor and assess the effect of interventions. For the viable NCD reconnaissance Georgia executed. The WHO STEP-wise methodology; 2 rounds of STEPS reviews have been led in 2010 and 2016 with specialized and financial help of the WHO-Euro and WHO-HQ and giving us the one of a kind probability to contrast the information and other nations as well as to monitor and assess examples and patterns of NCDs and hazard factors in Georgia. These are the initial steps to add to building sustainable observation frameworks, which improved national limit and gave the better health information and, in this manner, better opportunities important for successful NCD prevention and control to improve the health of our residents. In light of the information gave by the STEPS studies the multisector state gathering on NCDs prevention and control was set up in 2015. The National Strategy of NCD Prevention and Control and a 4-year activity plan has been endorsed in January 2017. The National Center for Disease Control and Public Health([www.ncdc.ge](http://www.ncdc.ge)) is implementing the State Program on Health Promotion, the biggest part of which is tobacco control, which includes a media crusade, training of the quit-smoking line staff and essential care centers, monitoring of enforcement of without smoke enactment in public premises, developing tobacco suspension portable application and school instructive materials. The other parts are among others liquor, nourishment, physical action, emotional well-being. In view of the STEPS and other review information and according to the technique and activity plan the fundamental medications for major NCDs (IHD and stroke, asthma and COPD, Diabetes type 2 and thyroid gland brokenness) for the most defenseless populaces are presently given through the Universal Healthcare Program. This has been operational during the previous four years and spreads essential support agreement administrations and a few meds at the essential care level. Georgia praises the World heart Day consistently with various occasions (World Heart Day run/stroll in Georgia, medical gatherings and so on.) The organizers of these occasions are the Georgian Society of Cardiology and Georgian Heart Foundation.
- **Future Prevention Planned** NCD's and hazard factors observation has an extraordinary potential to control the essential as well as optional prevention, disease screening and the executives. This remains most noteworthy test. They do trust that with international help, (for example, from the EAPC) we will have the option to conquer this test in the Nearest future considering effectively arranged reforms in essential just as public health frameworks of Georgia. Georgia main and prompt objective is to introduce a contemporary arrangement of epidemiological observation of the main non-communicable diseases and we plan to begin an expansive research program. Despite the fact that at present this is as yet dependent upon administrative endorsement. The key activities for the following 5 years: Systematic appraisal of obstructions to CVD prevention on the degrees of patient, supplier, health care framework and organizational level. Improvement of CVD the study of disease transmission and measurable examination strategies, just as piloting of different incentives for furtherance of prevention in health care, including the essential care level. Cardiac rehabilitation: organizing cardiac rehabilitation programming every major emergency clinic and clinics, just as establishing specific centers in the major urban communities. They have to examine the experience of other nations which have experienced a similar progress of cultural advancement and health care

restructuring.

## 5. CONCLUSION

Georgian Health Department are taking lots of efforts to reduce the impact on non-communicable diseases. They have taken various step to reduce non-communicable diseases under National Center for Disease Control and Public Health (NCDC), Georgian Society of Cardiology (GSC), the Georgian association for CVD Prevention and the Rehabilitation (GACPARD), Georgian Heart Foundation Cardiovascular percutaneous coronary intervention (PCI) centers, European Guidelines of CVD Prevention in Clinical Practice (ESC) and Cardiac Rehabilitation Program.

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## An Analysis of Effective Hybrid Multi-level Intrusion Detection System in Cloud Computing

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### ABSTRACT

In recent years, the cloud computing technology has grown to greater heights in delivering secure, reliable, sustainable, scalable computational resources with fault-tolerance systems at a nominal cost. In spite of exclusive services offered, the security in cloud computing is still a question of concern and threat. The threat to security mainly occurs due to hacking the cloud or intruders attacking the private data. To detect intrusion and prevent them, various classification methods in the form of algorithms have been used. In this paper, we have presented the Intrusion Detection System through classification. We have used the NSL-KDD dataset and tested using WEKA and analysed the Information Gain (IG) to select relevant features and conducted an analysis for better performance.

**Keywords:** Information Gain (IG), Intrusion Detection System (IDS), NSL-KDD dataset, Decision Tree, Support Vector Machine (SVM) classifier.

### 1. INTRODUCTION

The cloud computing technology deals with the applications and services connected to the data centres in the world through the internet. This technology helps users to store, process and share resources and other services [1]. The intrusion detection and prevention is now a challenge in the cloud computing environment. The security over the networks also pose increasing number of threats. The Intrusion Detection System (IDS) has been categorised into two types: Host-based Intrusion Detection System (HIDS) and Network-based Intrusion Detection System (NIDS). The HIDS can analyse and monitor the information retrieved from the host machine. It reports intrusion when there is a change in the behaviour. The NIDS has a robust detection mechanism to detect the intruders of the network. The intrusion is detected based on the comparison of the current behaviour and the past behaviour [2]. There are certain limitations to detect the threats. The Signature-based intrusion detection, requires an entry into the database. Based on the known patterns stored in the form of signature in the database, the threat gets detected [3]. In this paper, we have planned to apply the Information Gain (IG) as a filter-based method for feature selection of the dataset. Following which we have proposed to construct and enhance the detection accuracy of the IDS using hybrid classification algorithm using NSL-KDD dataset in WEKA 3.8.

### 2. RELATED WORKS ON HYBRID INTRUSION DETECTION

A new hybrid algorithm named Rough Set Neural Network Algorithm (RSNNA) had been used widely to reduce the amount of computing resources in terms of memory and CPU time to detect the attacks [4]. The stated algorithm used Rough Set theory to select features and a trained Artificial Neural Networks (ANN) has been used to identify new kinds of attacks. The KDD99 dataset was used for analysis and implementation.

Again with slighter development, the Linear Discriminant Analysis (LDA) algorithm was used for feature extraction for detecting intrusions and Back Propagation algorithm was used for classification of attacks [5]. Another new hybrid algorithm known as Principal Component Analysis Neural Network Algorithm (PCANNA) was used. The Principal Component Analysis (PCA) was used a reduction tool [6]. In this model, both the training time and testing time saw reduction.

Genetic Algorithm (GA) and K-Nearest Neighbour (KNN) were combined together to improve the classification performance. The K-Neighbours with GA calculated the distance to classify the samples used for testing through classification. The results showed the reduction in complexity [7].

An Anomaly-based Intrusion Detection System classified and detected numerous attacks. Packet behaviours were used as parameters for the anomaly detection [8]. To learn the system's behaviour, Back Propagation Artificial Neural Network was used with the KDD'99 dataset. Later using the Neural Network with Indicator Variable using Rough Set for attribute reduction (NNIV-RS) algorithm was used, which helped in the reducing

the amount of computer resources such as memory and CPU utilization time. It helped in classifying the network traffic packets [9].

The K-star algorithm with filtering analysis helps to build a Network Intrusion Detection using the NSL-KDD CUP'99 dataset. It provided accurate result with low false positive rate and high true positive rate [10].

### 3. PROPOSED APPROACH

In the proposed approach, we have planned to employ the anomaly detection through machine learning approach. The steps of the proposed work carried are as follows:

Step 1: Load the NSL-KDD dataset with a minimum of 42 attributes.

Step 2: Pre-process the training data and test data separately.

Step 3: Perform feature selection using the Information Gain filter-based method on the training data.

Step 4: Apply Random Forest classification technique to create normal trained and testing model.

Step 5: Generate the classified attack list and produce the performance results.

The step-by-step sequence of the proposed approach is represented in a figure shown below:

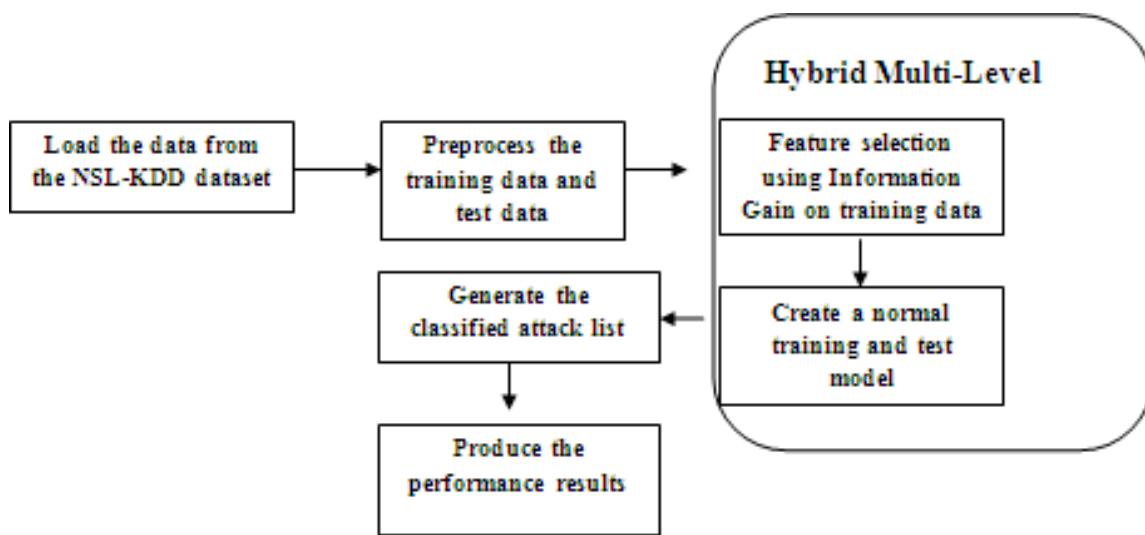


Fig. 1: Proposed Approach architecture

### 4. NSL-KDD DATASET DESCRIPTION

The NSL-KDD dataset is used for in the proposed approach. It is an enhanced version of KDD dataset. The attributes detect attacks like DoS, Probe, R2L, U2R and is widely used for anomaly detection. The description of attack classes is given below:

- **Denial of Service (DoS):** Determines successful computing of the attacker and busy memory resources or denies legitimate user access.
- **Probe:** Complete scan of network computer attacker gathers all information to find out known vulnerabilities of the target system.
- **Remote to Local attack (R2L):** Attacker gains access as a user to a specific machine without credentials. The attacker sends packets to exploit vulnerability.
- **User to Root (U2R):** Attacker gains normal access to user account and then gain the root access to system to exploit vulnerability.

### 5. TOOL APPLIED

We have used the WEKA 3.8.3 tool for pre-processing and classification. This tool does data processing, classification, regression, clustering, visualization and association rules. In the NSL-KDD dataset we have directly applied the Random Forest classifier algorithm for both the training and test datasets.

## 6. EXPERIMENTAL RESULTS AND ANALYSIS

All the 42 attributes of NSL-KDD dataset of both the training set and test set have been tested for intrusions.

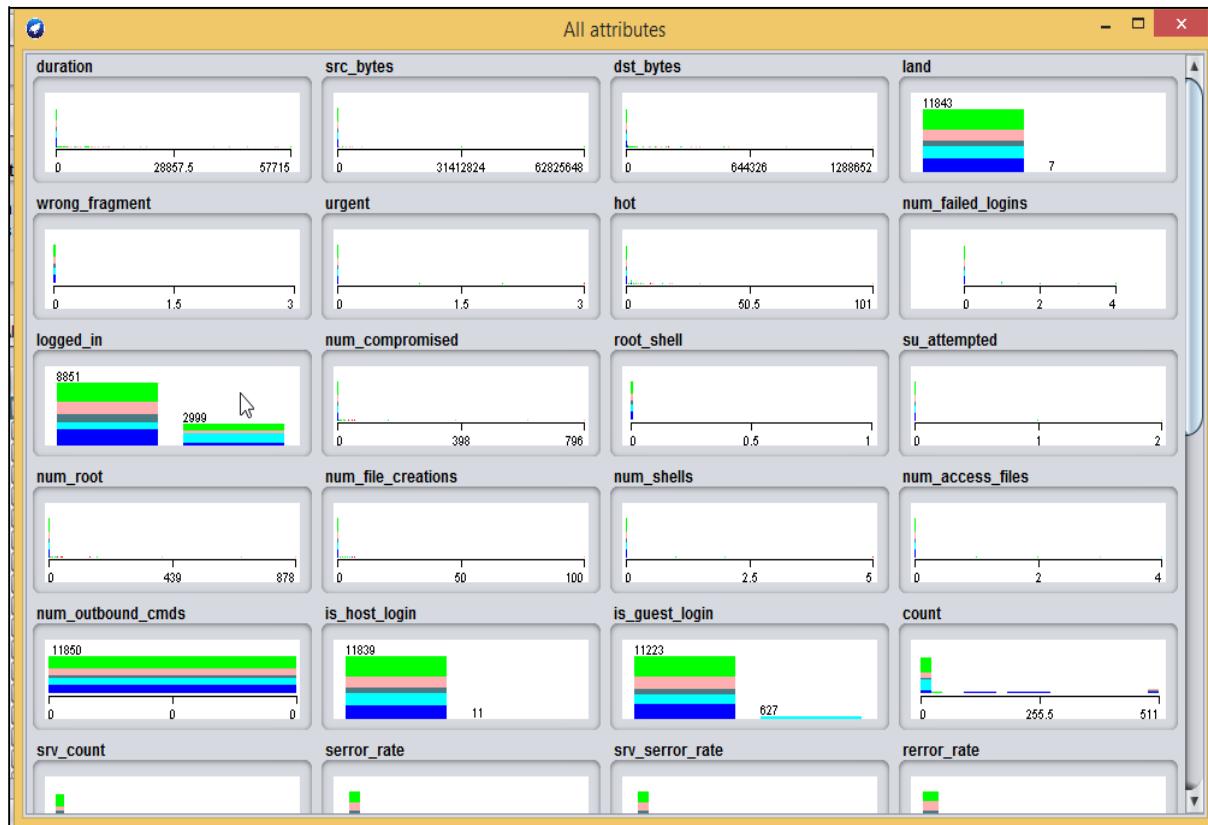


Fig 2: Visualization of NSL-KDD Multiclass test dataset



Fig 3: Visualization of NSL-KDD Multiclass training dataset

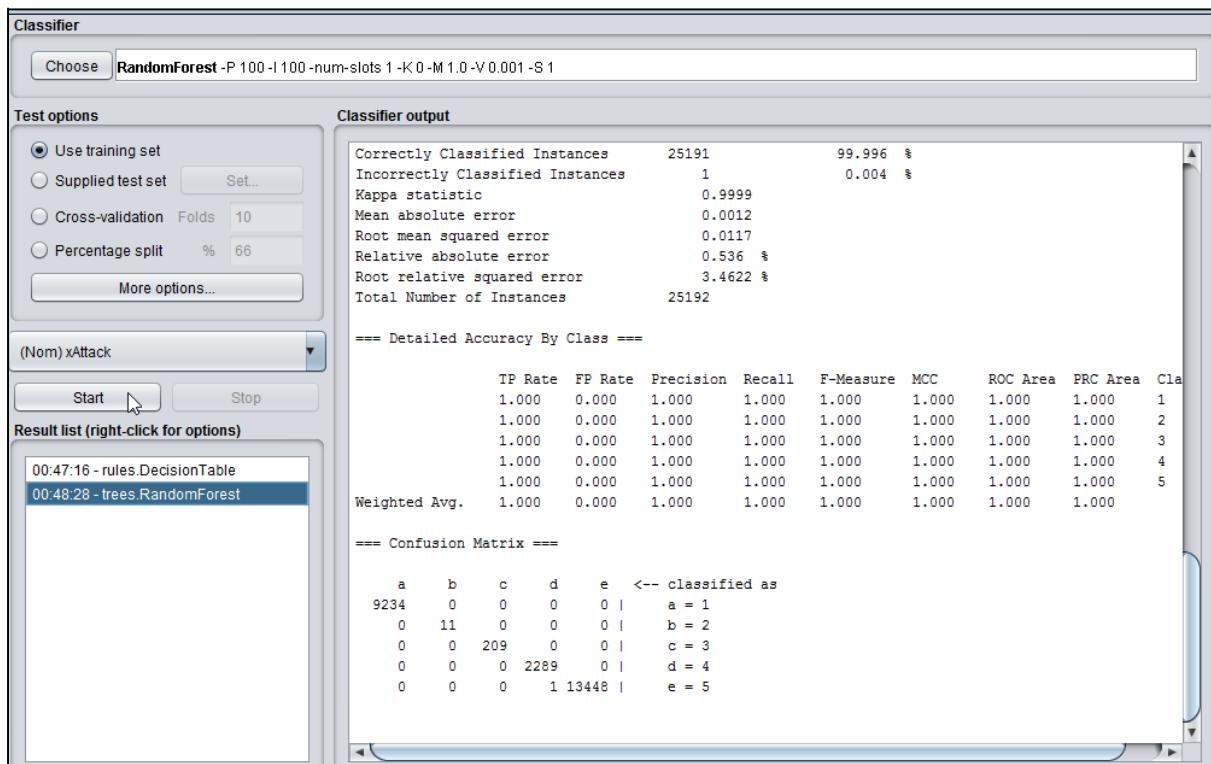


Fig 4: Evaluation result and confusion matrix of NSL-KDD training dataset

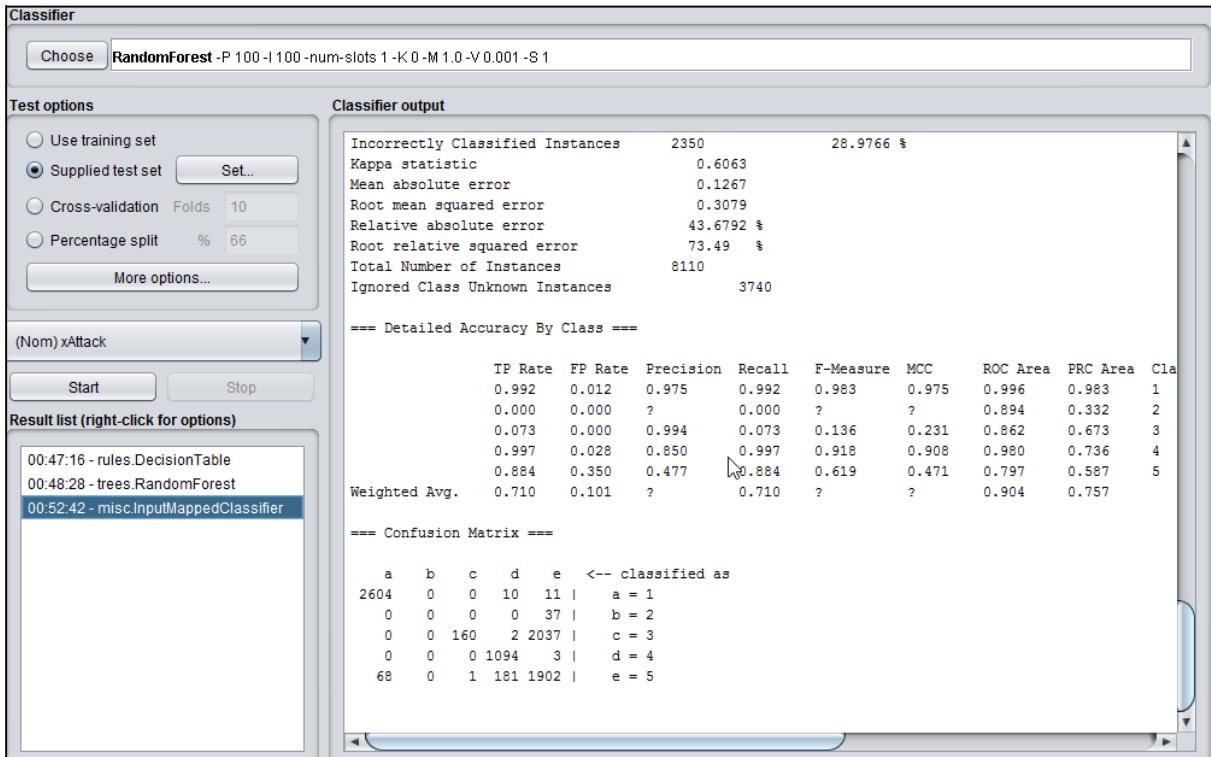


Fig 5: Evaluation result and confusion matrix of NSL-KDD test dataset

## 7. CONCLUSION AND FUTURE WORK

In this paper, we have implemented Random Forest classifier algorithm after pre-processing of both test and training dataset of the NSL-KDD dataset. The experiment is conducted on all the 42 attributes. Possibility of intrusion exists as we proceed with our work on the datasets. We have shown improvements in the performance of classifier for intrusion detection. As part of our future work, we continue to work on the performance metrics and analyse the completed hybrid model of our proposed work.

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## A exclusive case study on an individual suffering from unspecified pulmonary heart disease in Russia

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### ABSTRACT

*This paper talk about unspecified pulmonary heart disease unique case is diagnosed. The person is undergoing treatment in Russia. In the research the case history with all the details are mention in the paper.*

*Keywords: Pulmonary heart disease and Cardiac insufficiency*

### Main Disease: - Cardiac Insufficiency

#### 1. Personal Data: Case History

Date of Birth: 05-08-1960

Age: - 59 yrs.

Gender: Male.

Date of admission in to the Hospital: 10-09-2019

#### 2. Complaints of the patient

At the time of ocuompa, there is no shortness of Breathing. At the time of exercise, the pain in chest and shortness of breathing.

Dafrurue solu at the time of exercise, Blood pressure is 170/90 mm Hg, there is no feeling cold and no t°

No Dispeptic syndromes are occurs.

#### 3. History of the patient

There are no signs of Increasing Blood Pressure during whole life. Never took any kind of medicine for the regulation of Blood pressure

He told that he never felt pain in any body part region.

#### 4. Anamnesis of life

A Satisfactory medical condition, there is no medical history.

Bad habits is No alcohol, No drugs heredity not Burned.

Postponed diseases - HIV, sexually transmitted disease, viral Hepatitis, Denies, Tuberculosis Negative, Diabetics negative, all diseases were negative, Epidemiological History not burdened, Transfusion history is Negative, No Allergic History, No psychological problems, No problems with vision, No colour changes in vision, visible mucous membrane are visible also and clean.

No edema, conditions of varicose dilated & enlarged, but the peripheral lymph nodes are not enlarged, Muscular System there is No patholog. Bone system is rough visible pathology, Joints are not enlarged General examination of Pt. is normal & Consciousness.

#### Respiratory System

Breathing Quality through nose

Dryness during the respiration

Scratching behind the breast bone

**COUGH-** Appears in the morning time without sputum Dry Cough)

No asthma, No asphyxia

**PAIN-** in the chest to the left side irritation left part (upper part) of the body

**FEVER-**  $t^o$ -36 $^o$

**Voice-** Normal,

## **Digestive System**

Normal Appetite

No diarrheal effects, No nausea, Vomiting regularity of Excrements of faeces with Normal Colour. No itching in anus No pain with the time of defecation.

## **Review of ORGANS and Systems**

General Status: - Overall Health is Normal, No weakness,  $t^o$  – 36 $^o$ , weight loss, presence of edema at the lower limbs.

Blood System: pain in pericardial zone, localization of pain in behind the (Breast bone the left of sternum, in the apex), Crushing pain, Irradiation to the spacula and left hand with periodically ory continuously in nature, physically stress by removing by the ( Nitroglycerin, analgin), Behaviour during pain is high/up, the locomotor activity during the pain fear of death, depression high/up , sweating high/up, shortness of breathing is high/up, palpation is intensified,

Edema: - Feet, Abdomen mainly in the morning time.

Stolic BP: - 140 mmhg Diastolic BP 20mmhg

## **Urinary System**

No pain in lumbar zone, of over the pubis below the abdomen.

Nature of orientation in frequent at daily volume, No sign of polyuria, dysuria, anuria, orgaria)

No pain at the time of Micturation

Urine colour is transparent.

No blood sediment in urine.

## **Nervous System**

Headache, Dizziness with physical exercise change in body position with the time of pain, loss of consciousness at the time of pain, clear vision, smell & taste, no hearing loss signs.

## **Musculo skeleton system**

The pain in fonts, no stiffness in joints, no morning stiffness in movements, no tremor in limbs & convulsions.

## **5. Physical examination**

### **Inspection**

Consciousness - clear

Posture - Direct

Bodytyp e- Normostenic

Skin colour - earth grey

Edema - general

Lymph node - pherepheral lymph nodes enlarged.

## **6. Diagnoses**

KZ- sinus oumes C 4CC 93 B uuH (left voilation)

Hapywehue in ventral part.

Unspecified pulmeny heard disease.

Diaparatonic disease

Tricuspid malformation

Pulmonary arterin valve insufficiency.

## 7. Treatment (Cardiac Insufficiency)

Rx-

1. Duretics -

Spirinolactone- 50 mg/day in morning time.

2. Anticoagulative –

Warferins- 100mg/clay

3.  $\beta$  – Blocker-

Bicoprolal- 5 mg/ 1 tab/day (under control B.P.)

4. Analoprill- 2.5 mg in evening

5. Bicillin – 5 – 1.5 mg/ 2 times in a year – (summer / winter)

6. Tremetazilin 35 mg/ 2 times in a day- 2 month or 3 times in a year.

7. Panangin- 1tab – 3 times in a day for 3 months

## Demonetization and Informal Working in India

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### ABSTRACT

*All the factors of production engaged in economic activities in the modern monetized structured state are being hired on the monetary factors of payments. The modern state working factors are being facilitated through the state very less amount of promissory notes than the actual production of goods and services being produced in the society which in the traditional direct society were exchanged in barter at their full valued level of production.*

*The GDP currency ratio of developed country like Japan is about 24%, whereas the Indian GDP Currency ratio is merely about 7% on the purchasing power parity (PPP) basis. The people currency ratio in India is one least in the major world even lesser than the technically most advance nation where the digital money can be easily transected, forcing Indian unorganized 94% working to be engaged in the non-monetary & under monetary factors payment of economic activities which directly reduces the total production and basic utilities of the unorganized workers.*

*The sudden disruption of demonetization has created the mayhem and chaos in the economy which reduces the pace of the economic growth & development and encompasses through numerous pains and trauma to its informal subsistence working people of the recent over 86% currency demonetization, the economy has lost in all sector of growth which reduces the ongoing jobs to many of more than 1.5 crores out from the working industries of agriculture allied, small manufacturing, cotton textile, Handlooms, weaving, to services sector, overall the sudden process of demonetization has weaken the demand side of the economy.*

*This paper studies the economic growth and development of unorganized sector working through the trade-off of the informal working and the amount of total coins and currency in papers notes based money supply in the economy and disruption in basic currency money supply to digitals in the developing unorganized working economy.*

**Keywords:** Economic-State, Informal working, Money Supply, Demonetization.

### INTRODUCTION

The major workforce engaged in the Indian economy is Informal workers more than 81% of workforce out of 94% of unorganized sector workforce in India. India's informal sector workers has strengthen the backbone of Indian economy but at the same the backbone of informal workers has not been proportionately strengthen and formalized instead it has pushed workforce into the larger extent of informalisation since the independence.

The 15<sup>th</sup> International conference of labour statistician held on January 19-28, 1993 organized by international labour organization (ILO) at Geneva has identified a worker having no regular job contract, having no social security at the minimum wages that fulfills the basic household needs are informal workings.

The national commission for enterprises in the unorganized sector (NCEUS) has been constituted by government of India in 2004 under the chair of Professor Arjun Sengupta to look after the conditions of informal workforce and strive out the solutions for formalizing the maximum workforce. The commission found in their studies primarily the maximum unorganized sector workers of 93% informal workers at the larger extent having no such regular job contract and social securities.

The assessments of the cash money supply to the economy and working of informal work is going on for long time with less supply of money in that suffering conditions the November 08, 2016 immediate demonetization of 86.40% has ousted the financial flow of informal workers in that contemporary period, as the informal workforce transactions is usually based on the paper note based cash, so for the years 2016, 2017, 2018 it has been the years of decelerating growth, development over the periods of times and formalized and strengthen the free market big cartelized section at the cost of informal working.

## REVIEW OF LITERATURE

**Vipin Malik 2019** talks that the demonetization has weaken the confidence of people in the state will and sanctity and accusing the banking institution and government has created the extra cost charging intermediaries at the cost of people and system.

**Dash & Farooque 2019** found that the sudden demonetization of November 08, 2016 has broaden the extent of informalisation of workforce in absolute as the under payment extent to the major 94% unorganized sector working peoples has increased in the contemporary period.

**Sen 2019** strongly asserted that Indian economy has suffered in many ways and all the ways to the major of working by the government unplanned and un-assessed immature decision of demonetization.

**Basu 2018** the former chief economic advisor (CEA) of government of India asserted that demonetization has only added and burdened the informal workforce.

**Subramanian 2018** found being the contemporary chief economic advisor (CEA) the demonetization has shocked the informal sector, the government didn't even consulted the on such an important subject and policy to CEA office.

**Ghatak 2017** found that the informalisation of formal jobs has been pushed through demonetization as the formal sector commands informal sector at the very cheaper rates.

**Thaler 2017** the nobel laureate economist found that the demonetization has been deeply a flawed as demonetizing of Rs 1000 and printing the Rs 2000 will simply increase the hoarding and the corruption instead of any checking of anything else.

**Stiglitz 2017** the idea of demonetization has replaced the human from the mainstream to fragile informality at large.

**Patnaik 2016** the forced cash-wiping out from the poor and mass has increased the vulnerability of already the larger extent under paid informal working which decreases the productivity and essentialities.

## OBJECTIVE OF THE STUDY

This study has been made on secondary data basis subjectively assessing the impact of disruptive money supply to the informal sector and its consequences on the workforce employment, remunerations, growth and development. The paper simply trying to understand the philosophy of the policy and practice of monetization, demonetization & re-monetization with informal workforce.

## MAGNITUDE & DIRECTION OF DEMONETIZATION AND INFORMAL WORKFORCE

The Indian economy has been decelerating since the demonetization at annual growth rate of GDP at constant prices 2011-12.

Years	Growth Rate at Constant Prices	2011-12 in %
2014-15		6.1
2015-16		6.8
2016-17		5.8
2017-18		5.2

Source: Central Statistical Organization (CSO), Ministry of Statistics and Programme Implementation (MSPI),  
Table 2.1 Page 3

The above table of post demonetization of three years data of growth on constant price at 2011-12 clearly showing the post demonetized period has registered the decelerating growth which affected the most to the informal sector in those 3 years of period. The three years aggregate decline in the rate of growth is much bigger than the aggregate domestic yearly production (GDP) of least the least 137 countries of the world, whose total annual aggregate production is less than Rs10 lacs crores.

The most important and remarkable analysis says the demonetization of low currency denominations has been sinking from the long times, for last 20 years since 2000 the share of high denominations of Rs 500 & 1000 has gone up from 26% in 2000 to 86.40% in November 2016, so the accusation to the current government alone of demonetization and replacing the low denomination is wrong but in fact by march 2018 the share of Rs 500 & 2000 notes was 80.20% which is still lower than Rs 500 & 1000 of 86.40%.

So the overall discussion and analysis suggest the policy of demonetization was not well assessed in prior to the implementation, which suffered mostly to the informal working and asserted the cost of formalizing the free market economy to the informal workforce.

## CONCLUSION & SUGGESTIONS

The immediate ban of 86.40% of total currency from the economy has taken away the payments factors of informal working in the years which cascading effect affected the further factors of payments and factor productivity of the informal sector at the same it has been found that demonetization has formalized the free market organized institutions. On the global per people average of paper currency India needs more paper currency to print and especially of lower denominations which should be made accessible and available to the informal workforce like agriculturist, weavers, manufacturing workers etc that transform the increasing productivity, growth and development of informal workforce at the par of formal workforce and economy, state and society be transformed into a formalized and better one.

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## Reasons to Use AI in Healthcare

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### ABSTRACT

*“Time and tide waits for none” by Geoffrey Chaucer .The idiom here speaks about has been used to help understand the importance of technology in servicing the human beings. This paper speaks about the history, the evolution and relationship between artificial intelligence, machine learning and deep learning and its fabulous impacts, which have helped medical science in multiple arenas. The paper aims to explain artificial intelligence use to aid radiologist understand the early detection and analysis of diseases, here we have also given the various applications where it can be used.*

**Keywords:** Artificial Intelligence, Machine learning, healthcare, cancer, exoskeletal.

### 1. INTRODUCTION

Artificial intelligence (AI), defined as computers that behave in ways that formerly were thought to require human intelligence, has the potential to considerably improve radiology, help patients, and decrease cost [1]. More commonly, AI refers to a field of computer science keen to the creation of systems performing tasks that usually require human intelligence, branching off into different practices [3]. Machine learning (ML), a term announced by Arthur Samuel in 1959 to describe a subfield of AI [4] that includes all those methods that allow computers to learn from data without being explicitly automated, has been extensively applied to medical imaging [5]. Among the techniques that fall under the ML umbrella, deep learning (DL) has arose as one of the most promising. Certainly, DL is a technique belonging to ML, which in turn refers to a broader AI family (Fig. 1). DL methods fit to representation-learning methods with multiple levels of representation, which process raw data to perform classification or recognition tasks [6].

Radiologists are experts at obtaining information from medical images. AI can extend this expertise, extracting even more data to make better or entirely new predictions about patients. Going forward, conclusions about images will be made by human radiologists in combination with intelligent and autonomous machines. Though the machines will make mistakes, they are likely to make decisions more efficiently and with more uniformity than humans and in some instances will contradict human radiologists and be proven correct. AI will affect image interpretation, report generation, result message, and billing practice [1, 2]. AI has the budding to alter professional relationships, patient engagement, knowledge hierarchy, and the labour market. Additionally, AI may aggravate the concentration and imbalance of resources, with entities that have important AI resources having more “radiology decision-making” capabilities. Radiologists and radiology departments will also be data, characterized and evaluated by AI models. AI will infer patterns in personal, professional, and institutional behaviour. AI is complex and carries probable pitfalls and inherent biases. Extensive use of AI-based intelligent and autonomous machines in radiology can increase systemic risks of harm, raise the possibility of errors with high penalties, and amplify complex ethical and societal issues. Presently, there is little experience using AI for patient care in all its challenging and diverse settings. Widespread research remains to be done to understand how to use AI in clinical practice and the operational characteristics they should have. The tactic to these issues will be shaped as much by the community’s ethics as by technical factors. Other effects are secondary, such as algorithms that make enterprise or public policy verdicts or find patterns in the data of large populations to improve public health and our considerate of diseases and treatments. Radiology’s goal should be to derive as much value as possible from the ethical use of AI, yet resist the lure of extra financial gain from unethical uses of radiology data and AI. This consensus statement aims to notify a common understanding of the ethical issues connected to using AI in radiology and to inspire radiology AI’s builders and users to improve radiology’s intelligence in humane ways to promote just and beneficial outcomes while evading harm to those who expect the radiology public to do right by them.

ML includes computational models and algorithms that imitate the architecture of the biological neural networks in the brain, i.e., artificial neural networks (ANNs) [7]. Neural network architecture is structured in layers self-possessed of interconnected nodes. Each node of the network performs a weighted sum of the input

data that are consequently passed to an activation function. Weights are vigorously optimised during the training phase. There are three diverse kinds of layers: the input layer, which receives input data; the output layer, which generates the results of data processing; and the hidden layer(s), which mines the patterns within the data. The DL approach was developed to improve on the performance of conservative ANN when using deep architectures. A deep ANN varies from the single hidden layer by having a huge number of hidden layers, which characterise the depth of the network [8]. In the ensuing 60 years, enthusiasm for AI has waxed and waned but has reignited recently with the availability of ever less expense, massively parallel computing systems. The term deep learning was added to the AI lexicon to reflect the ability to harness new computing power to develop more powerful AI approaches with more layers of examination. The accomplishments of AI series from IBM (Armonk, New York) in the games of chess and the quiz show Jeopardy! (Deep Blue) and from Google (Mountain View, California) in the game of Go (DeepMind) [9] were exciting indicators that made people outdoor of the scientific community aware of AI and its possible.

Major companies and governments around the world have comprised AI technology as one of the important policies for dealing with the enormous amounts of digital data being produced in the information age—the age of “big data.” AI is also on the entrance of medical exercise. The radiology community has played a leading role in insisting medicine into its digital age and now has the opportunity to become a leader in seeing medical applications of AI. The tens of millions of radiology reports and billions of images now stored in digital form illustrate the concept of “big data” and constitute the required substrate for AI research. The important question is whether AI applications in radiology can add value. Adding value includes the discovery of new knowledge and extraction of more and better data from imaging examinations to achieve better outcomes for patients at lower cost. For radiologists, adding value includes establishment of more efficient work procedures and improved job satisfaction. The goal of this viewpoint is to help create a framework—apart from a conversation of AI technology per se—for developing strategies to explore the potential of AI in radiology and to identify a number of technical, cultural, educational, and ethical matters that need to be spoken.

## 2. HISTORY OF AI

Alan Turing (1950) was one of the originators of modern computers and AI. The “Turing test” was based on the fact that the intelligent behaviour of a computer is the ability to achieve human level performance in cognition related tasks. Study in the 1960s and 1970s created the first problem-solving program, or expert system, known as Dendral. Though it was intended for applications in organic chemistry, it provided the basis for a succeeding system MYCIN, considered one of the most important early uses of artificial intelligence in medicine. MYCIN and other systems such as INTERNIST-1 and CASNET did not attain routine use by physicians.

The 1980s and 1990s saw a rise in interest for AI. Artificial intelligent methods such as fuzzy expert systems, Bayesian networks, artificial neural networks, and hybrid intelligent systems were used in diverse clinical situations in health care. In 2016, the biggest chunk of investments in AI research were in healthcare applications associated with other segments.

AI in medicine can be classified into two subtypes: Virtual and physical. The virtual part arrays from applications such as electronic health record schemes to neural network-based supervision in treatment decisions. The physical part works with robots supporting in performing surgeries, intelligent prostheses for handicapped people, and elderly care. The foundation of evidence-based medicine is to create clinical correlations and insights via emerging relations and patterns from the existing database of information. Conventionally, we used to employ statistical methods to establish these designs and associations. Computers learn the art of identifying a patient via two broad techniques - flowcharts and database method.

The flowchart-based tactic involves interpreting the process of history-taking, i.e. a physician asking a series of questions and then arriving at a likely analysis by uniting the symptoms available. This requires nourishing a large amount of data into machine-based cloud networks considering the wide variety of symptoms and disease progressions encountered in routine medical practice. The outcomes of this methodology are limited because the machines are not able to detect and collect cues which can only be witnessed by a doctor during the patient questionnaire. On the contrary, the database method exploits the principle of deep learning or pattern recognition that involves teaching a computer via repetitive algorithms in recognizing what certain groups of symptoms or certain clinical/radiological images look like. An example of this approach is the Google's artificial brain project floated in 2012. This system skilled itself to distinguish cats based on 10 million

YouTube videos with effectiveness improving by revising more and more images. After 3 days of wisdom, it could guess an image of a cat with 75% correctness. [10, 11]

### 3. ARTICLES PUBLISHED ON ARTIFICIAL INTELLIGENCE, MACHINE LEARNING AND DEEP LEARNING

The great eagerness for and vitality in the expansion of AI systems in radiology is shown by the increase in publications on this topic. Only 10 years ago, the total sum of publications on AI in radiology only just exceeded 100 per year. Thereafter, we had a tremendous increase, with over 750–900 publications per year in 2016–17. In the last couple of years, computed tomography (CT) and magnetic resonance imaging (MRI) have jointly accounted for more than 55% of articles, though radiography, mammography, and ultrasound are also signified. Neuroradiology is the most involved subspecialty, followed by musculoskeletal, cardiovascular, breast, urogenital, lung/thorax, and abdominal radiology, each representing between 6 and 9% of the total number of papers. AI presently has an impact on the field of radiology, with MRI and neuroradiology as the major fields of novelty. Table 1 indicates the countries publishing articles related to artificial intelligence in radiology. [17]

Studies presented the application of DL algorithms for measuring the risk of malignancy for a lung nodule, guessing skeletal maturity from paediatric hand radiographs, classifying liver masses, and even precluding the need for thyroid and breast biopsies [14–16]; at the same time, the vendors presented instances of AI applications in action [14, 15].

**TABLE I: Countries With Highest Numbers of Radiology Artificial Intelligence Publications (2000–2018)**

Rank	Country	Total No. of Publications
1	United States	3836
2	China	973
3	Germany	762
4	United Kingdom	612
5	Canada	493
6	Japan	398
7	The Netherlands	372
8	France	365
9	India	317
10	Italy	311
11	South Korea	305
12	Australia	239

Note—Some publications are recorded in more than one country according to authorship.

### 4. APPLICATIONS OF AI, ML AND DL IN HEALTHCARE

#### Recognizing cardiovascular irregularities and saving analysis time

Gauging the varied structures of the heart can reveal an individual's risk for cardiovascular diseases or identify problems which will got to be addressed through surgery or pharmacological management. Automating the detection of abnormalities in commonly-ordered imaging tests, like chest x-rays, could lead on to quicker decision-making and fewer diagnostic errors.



Fig : The amount of time a doctor can save while interpreting the reports generated.

For example, when a patient enters the casualty department with a complaint like shortness of breath, “the chest radiograph is usually the primary imaging study that’s available,” ACR DSI says. “It are often used as a fast initial screening tool for cardiomegaly, which in and of itself are often used as a marker for heart condition. A fast visual assessment by a radiologist is usually inaccurate.”

Using AI to spot left atrial enlargement from chest x-rays could rule out other cardiac or pulmonary problems and help providers target appropriate treatments for patients.

Similar AI tools might be wont to automate other measurement tasks, like semilunar valve analysis, carina angle measurement, and arteria pulmonalis diameter. Applying AI to imaging data can also help to spot thickening of certain muscle structures, like the ventricle wall, or monitor changes in blood flow through the guts and associated arteries.

“Automated arteria pulmonalis flow quantification would save the interpreting physician time via elimination of manual measurements, prevent detection errors, and supply structured quantitative data, which might be utilized in later studies or risk stratification schemes. Algorithms could mechanically populate reports, saving time for human clinicians, and recognize dimensions or values that qualify as irregular.

## **IDENTIFYING FRACTURES AND FORMER MUSCULOSKELETAL WOUNDS**

Fractures and musculoskeletal wounds can give to long-term, chronic pain if not handled quickly and correctly. Injuries like hip fractures in elderly patients also are tied to deprive overall outcomes thanks to decreases in mobility and related hospitalizations. Using AI to spot hard-to-see fractures, dislocations, or soft tissue injuries could permit surgeons and specialists to be more self-assured in their treatment selections. After trauma, fractures are often measured secondary in position, a minimum of compared to internal bleeding or organ injury. For example, a patient presenting to the ED with head and neck trauma might be assessed for odontoid fracture – a kind of fracture within the cervical spine – by using an AI radiology tool. The fracture type is usually problematic to detect on standard images, but AI tools could also be more likely to fix subtle variations within the image that would specify an instability that needs surgery. Allowing unbiased algorithms to review images in trauma patients may help to make sure that each one injuries are accounted for and obtain the care required to safe a positive outcome. Providers can also find that AI provides a useful safety net when conducting routine follow-ups for common hip surgeries, like hip replacements. “There are roughly 450,000 total hip arthroplasties (THAs) done yearly,” “Every patient has annual follow-up exams, which may add up to about 120 exams per day for a musculoskeletal radiologist who works with arthroplasty surgeons. “Unfortunately, recognizing problems round the site are often thought-provoking. “Findings aren’t willingly apparent on x-ray and need comparison with multiple prior exams to ascertain progression of abnormality over time,” “Delay in analysis could delay treatment for years. AI meeting this use case would help to scale back the false negative rate, patient risk, and medical legal risk for the radiologists. High-risk patients might be screened for raised serum cobalt levels and sent to MRI for further evaluation.”

## **ASSISTING IN THE DIAGNOSIS NEUROLOGICAL AILMENTS**

Degenerative neurological diseases, such as amyotrophic lateral sclerosis (ALS), can be a shocking diagnosis for patients. While there is presently no cure for ALS and many alike neurological conditions, accurate diagnoses could help individuals realize their likely outcomes and plan for long-term care or end-of-life wishes.

**Identifying** – and distinctive among ALS and primary lateral sclerosis (PLS) – depend on imaging studies. Radiologists must select if lesions are related or simply imitating the structures of one of the diseases, and false positives are fairly common. Recent research into improving the speed and accuracy of identifying has focused new biomarkers.

“Currently, manual segmentation and quantitative susceptibility mapping (QSM) assessments of the motor cortex are necessary, difficult, and time consuming,” “Automating this process with machine learning would ease research and assist in the development of a promising imaging biomarker. “Algorithms may be able to streamline this process by flagging images that indicate suspect results and offering risk ratios that the images contain evidence of ALS or PLS. Algorithms may also be able to automatically populate reports, reducing workflow burdens on providers.

## Flagging Thoracic Difficulties

Pneumonia and pneumothorax are two situations that need quick replies from providers. Both may also be major targets for artificial intelligence algorithms. Pneumonia, moreover acquired in the community or after a medical procedure, can be life threatening if ignored. Radiology images are often used to diagnose pneumonia and differentiate the illness from other lung conditions, such as bronchitis. Yet radiologists may not always be existing to read images – and even if radiologists are existing, they may have difficulty recognizing pneumonia if the patient already has lung conditions, such as malignancies or cystic fibrosis. In addition, subtle pneumonias, such as those projecting below the dome of the diaphragms on front chest radiographs, can easily be ignored and lead to recurrent CT scans, which AI could help reduce. An AI algorithm could evaluate x-rays and other images for sign of opacities that specify pneumonia, then alert providers to the potential diagnoses to allow for speedier treatment. AI can similarly help to identify high-risk patients when pneumothorax is suspected, particularly when radiologists are not present.

In clinical settings where a radiologist is not willingly available, detection [of pneumothorax] would be of value to non-radiologists. Artificial intelligence may be able to help rank the type and sternness of pneumothoraxes, which may change the urgency of action. One possible extension to this use case is to track variations in size of previously noticed pneumothoraxes and those under treatment.

## Screening for Common Cancers

Medical imaging is usually utilized in routine, preventive screenings for cancers, like carcinoma and carcinoma. In carcinoma, micro calcification in tissue can often be difficult to conclusively identify as either malignant or benign. False positives could lead on to unnecessary invasive testing or treatment, while missed malignancies could end in delayed diagnoses and worse outcomes.

“There is inconsistency in radiologist interpretation of micro calcifications at the time of diagnostic imaging,” “AI can help improve accuracy and use measurable imaging features to more precisely categorize micro calcifications by level of doubt for ductal carcinoma in place (DCIS), potentially decreasing the speed of pointless benign biopsies.” Providing risk scores for areas of concern could allow providers and patients to form more informed decisions about the way to proceed with testing or treatment. Similarly, patients undergoing screenings for colorectal cancer may have more productive conversations with their providers if polyps are found during routine checks. Polyps are precursors to cancer. “CT colonography (CTC) provides a slightly invasive structural exam of the colon and rectum to detect clinically significant polyps,” explains. “However, less experienced radiologists can miss polyps and take excessive time to finish the exam. AI could help improve correctness and efficiency of polyp discovery at CTC, reduce false positives, and reduce medical legal risk for radiologists.”

For patients with recognized cancers, AI could support the finding of malignancies that have spread. Extra nodal extension (ECE) of cancers is related to poor prognosis, and is usually only discovered at the time of a surgery. A performant algorithm could potentially identify ECE for diagnoses that don't usually proceed to surgery, potentially enabling better treatment stratification during this population. Automated ECE cataloguing and identification could also enable better radiotherapy targeting of nodal basins, also as action optimization for post-operative imaging-detected nodal disease. AI might be useful for head and neck cancers, prostatic adenocarcinoma, colorectal cancers, and cervical cancer, the society says.

## Drug creation

Machine learning algorithms are now being used with numerous achievements to decrease drug discovery times. Developing pharmaceuticals by means of clinical tests is exceptionally tedious, as often as possible taking considerably more than 10 years, and cost billions of U.S dollars. Using AI to revive parts of the drug discovery process can be much quicker, cheaper, and safer. At an equivalent time AI cannot completely remove all the stages concerned in drug creation, it can assist with stages like, discovering new compounds that would be possible drugs. It also can assist to seek out new applications for previously tested compounds [18]. Between the West Africa Ebola in 2014 virus outbreak, a program powered by AI was used to scan accessible medicines which may be redesigned to fight against the disease. Two drugs were discovered to scale back infectivity in at some point, when analysis of this type generally takes months to years, a difference that might signify saving thousands of lives [19]. Shortly from now, AI platforms united with in-memory computing technology will have the capacity to supply accelerated drug discovery and development and delivery and also help scientists find new uses for drugs [18].

## Diabetes Management

Diabetes may be a chronic progressing metabolic turmoil described by high blood sugar level. Increment in blood sugar level is distinguished due to either pulverization of pancreatic  $\beta$ - (Type I) or cells immune to insulin (Type II). The disease development directs to severe micro vascular or macro vascular disorders such as neuropathy, nephropathy, retinopathy and cardiomyopathy [20]. The rationale for AI in analysis or checking of diabetes and its inconvenience can build up the patient's magnificence of life [21]. The pc assisted diagnosis, decision support systems, specialist systems and execution of software may help physicians to scale back the intra and inter-observer variability. The appliance of AI enhances illumination of outcomes with high accuracy and extreme speed.

## 5. CONCLUSION

Needless to say time has brought multiple technologies to healthcare industry always boosting for the best of human kind, but the applications and its future scope will eventually help us for a smooth survival indeed; provided the best form is used and not misinterpreted for personal growth.

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## Impact of Data Mining on Value Enhancement in the Education Sector

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### ABSTRACT

*Data mining is the procedure of examination of huge measure of information to discover valuable examples and rules. Datamining is the way toward taking data from an informational collection and changing over it into a justifiable and important structure for additional utilization. Educational Data Mining (EDM) is a rising field to investigate the information from different instructive settings. It gives characteristic information about conferring the instruction, which is utilized to upgrade the nature of educating and learning. Powerful arranging can give customized training. Information can be utilized for ordering and anticipating the understudies' conduct, execution, dropouts just as instructors' presentation. What's more, lays accentuation on use of information mining that add to offer focused courses and improve their business. It additionally finds the exhibition and enthusiasm of understudies in different fields. Information mining is utilized in training part to deal with the record of understudies proficiently. Establishments might want to know, which understudies will join up with which course, and which understudies will require help. Here and there the board needs more data about understudies like their outcome, the accomplishment of new courses. The appropriate response of every one of these issues is "Data Mining". EDM is valuable in a wide range of regions including recognizing in danger understudies, distinguishing need adapting requirements for various gatherings of understudies, expanding graduation rates, adequately evaluating institutional execution, augmenting grounds assets, and enhancing subject educational plan recharging. This paper displays an overview on different segments of educational information mining alongside its destinations.*

*Keywords: Data Mining, Education, Value Enhancement*

### INTRODUCTION

#### Data mining

Data mining is a procedure of taking out valuable data and patterns from a significant measure of information. The principle objective of this investigation procedure is to take data from an informational collection and convert it into a reasonable and significant structure for additional utilization. Data Mining is utilized for taking care of issues by dissecting information that is available in the databases.

#### Need of Data Mining in Education

Regardless of critical advancement in the course of the most recent ten years, Indian higher education is confronted with the following expansive difficulties:

- Gap between Demand and Supply
- Poor Quality of educating and learning
- Limited research Capacity

There are incredible openings in the instructive information through which our insight towards training is massively expanded as looked at in the previous decade. Instructive information is expanding quickly as increasingly more training framework is going on the web. It has opened new zones like new computer driven interactive learning strategies and designs smart coaching framework, recreation activities which had opened up chances to gather and break down understudy information, to find patterns in those information and to make new disclosures and test speculation about how understudies learn through on line classes. The information gathered from web-based learning frameworks can be collected over huge quantities of learners and can contain numerous factors that information digging calculations can investigate for model structure.

#### EDUCATIONAL DATA MINING (EDM)

Educational Data Mining (EDM) is an upcoming field in Knowledge discovery. Because of far reaching development of advanced education, forecasts identified with students' performance can be precisely done through EDM. Not just expectations, order, affiliations and gathering should likewise be possible with

flawlessness utilizing statistical and programming tools. The Education framework can be furnished with more data identifying with future drop out of undergraduates and their achievement in enlisted courses. Students as well as other partners could be profited by EDM. These days intelligent e-learning strategies and instruments have opened a chance to gather and investigate understudy information.

## DATA MINING TECHNIQUES

Data mining methods are utilized to operate on extensive volumes of information to discern hidden patterns and connections accommodating in decision-making. While data mining as well as knowledge discovery in database are mostly used interchangeably, data mining is a part of knowledge discovery.

Multiple techniques and algorithms used for knowledge discovery from databases:

**A. Classification:** Classification is the most frequently applied data mining technique that utilizes a lot of pre-classified guides to build a model that can categorize records on the loose. This often utilizes decision tree or neural network-based classification algorithms. The data order process includes learning and grouping. Here the training data is examined by classification algorithm. In classification test, information is utilized to evaluate the exactness of the classification rules. On the off chance that the exactness is satisfactory the principles can be applied to the new data tuples. The classifier-training calculation utilizes these pre-arranged guides to decide the arrangement of parameters required for legitimate segregation. The algorithm at that point encodes these parameters into a model called a classifier.

**B. Clustering:** Clustering can be said as ID of similar classes of items. By utilizing clustering method, we can additionally recognize dense and sparse locales in object space and can find generally dispersion pattern and relationships among data properties. Classification approach can likewise be utilized for successful means for recognizing gatherings or classes of object yet it turns out to be expensive so clustering can be utilized as a pre-processing approach for attribute subset choice and classification.

**C. Predication:** Regression technique can be adjusted for predication. Regression analysis can be utilized to demonstrate the connection between at least one independent variables and dependent variables. In data mining independent variables are qualities already known and response factors are what can be foreseen. However, some issues are not just predictions. Along these lines, increasingly complex procedures (e.g., decision trees, logistic regression, or neural nets) might be important to gauge future values. A similar model can regularly be utilized for both regression and classification. For instance, the CART (Classification and Regression Trees) decision tree algorithm, can be utilized to develop both classification trees (to classify categorical response variables) and regression trees (to forecast persistent response variables). Neural networks can also create classification and regression models.

**D. Association rule:** Affiliation and co-relation are generally to discover frequent item set findings among huge data sets. This kind of finding causes organizations to settle on specific choices, for example, index configuration, cross marketing and customer shopping behaviour analysis. Association Rule algorithms should have the option to create rules with certainty esteems short of what one. The quantity of conceivable Association Rules for a given dataset is commonly exceptionally large and a high extent of the guidelines are as a rule of pretty much nothing (if any) value.

**E. Neural networks:** Neural network is a set of associated input/yield units and every association has a weight present with it. During the learning stage, network learns by modifying loads in order to have the option to foresee the right class labels of the info tuples. Neural systems have the exceptional capacity to get importance from convoluted or loose information and can be utilized to extricate designs and identify patterns that are too mind boggling to be in any way seen by either people or other PC methods. These are appropriate for continuous value inputs as well as outputs. Neural networks are best at distinguishing trends in data and appropriate for gauging needs.

**F. Decision Trees:** Decision tree is a tree-formed structure that speak to sets of decisions. These decisions create rules for the grouping of a dataset. Specific decision tree techniques incorporate Classification and Regression Trees (CART) and Chi Square Automatic Interaction Detection (CHAID).

**G. Nearest Neighbour Method:** A strategy that groups each record in a dataset dependent on a combination of the classes of the k record(s) generally similar to it in a verifiable dataset (where k is greater than or equivalent to 1). Also called the k-nearest neighbour technique.

## APPLICATION OF DATA MINING TECHNIQUES IN EDUCATION SECTOR

The following functional areas can benefit from the application of data mining in the education sector:

<b>Predicting Learners' Admission in Higher Education</b>	<p>As an increasing number of organizations are built from private divisions, the student's expectation from these establishments is likewise expanding. They apply for admission in any new course after scrutinizing different components that are considered vital for their holistic development.</p> <p>It was noticed that the significant quality in foreseeing undergraduates enrolment is seen as Graduation Stream (GS) by Yadav et al (2012). The study shows that the student's past scholastic performance can be utilized to make a decision tree model utilizing ID3 calculation that is utilized for predicting a learner's enlistment in MCA course. The study found that students with a foundation of math or computers performed better in MCA course over students with other academic foundations.</p> <p>Classification and regression (CART) are the generally utilized Data Mining procedures for such forecasts. Kovacic, J. Zlatko (2010) utilized CART for foreseeing learners' affirmation. Aksenova et al. (2006) form prescient model for fresher, existing and returned students at both graduate and undergrad levels. Based on pre-enrolment information they suggested students who are arranged in the class of "High Risk" ought to be tutored so as to limit dropouts</p>
<b>Predicting Learners' Profiling:</b>	<p>EDM can likewise be utilized as a viable instrument in profiling students on both hard as well as soft skills. The hard factors incorporate academic foundation, evaluations and accomplishments while soft factor incorporates correspondence, conduct, attitude, interests and so forth. Various Data Mining Techniques and algorithms have been employed for this task.</p> <p>Naïve Bayes, Support Vector Machines, Bayes Net, Logistic regression and Decision Tree are for the most part utilized for student profiling. Cluster analysis should be possible to learners' profiling and separate promoting strategies can be set up to target segmented students.</p>
<b>Predicting Learners' course/programme selection</b>	<p>Selection of a course relies upon different factors, for example, learner's advantage, grades, further interest and so on. Kardan et al. (2013) decide different components impacting a learner's course determination utilizing neural networks, for example, qualities, learners' workload, course reviews, course type, course span, and time clashes, final assessment time and students' interest. These components are utilized as contribution of neural system displaying. Besides, Guo (2010) dissect and anticipate understudy network modelling utilizing neural networks. He found that number of learners enlisted to a course and high qualification rate in conclusive reviewing are the two most powerful factors to students' course satisfaction.</p>
<b>Predicting Learners' Performance:</b>	<p>Data Mining is most prominently used to foresee performance of learners. Different prediction tools are accessible like regression and correlation examination, decision tree, Bayesian systems, neural network and so forth. Kumar and Uma (2009) examined students' performance in the course utilizing data mining techniques, especially classification techniques, for example, Naïve Bayes and Decision tree dependent on student ID and grades or marks scored in course. Data mining techniques causes students and educators to improve the former's performance. Tair M. M. Abu (2012) et al indicated the use of Data Mining in higher education to find information about students' performance. The paper proposes different strategies to improve the performance of graduates. It proposes to utilize two classification techniques, Rule Induction and Naïve Bayesian classifier, to anticipate the evaluation of the alumni understudy. Students' clustering was done by utilizing K-means clustering algorithm. Distance based Approach and Density-Based Approach</p>

	exception approach was utilized to distinguish all anomalies in the information.
<b>Completion of the Course</b>	Universities and Colleges can cluster graduates and undergrads into collectives dependent on the latter's satisfaction, loyalty and objections to comprehend their trends in course completion.
<b>Predicting Learners' Survival in a course/ Learners' Dropouts</b>	The issue of student dropout is common in professional courses. Regularly students find themselves un-accommodatable for the course and accordingly withdraw. Massa and Puliafito (1999) considered the issue of college dropout by utilizing Markov Chains, another data mining system. They reason that conduct of homogenous groups can be examined through Markov chain. It tends to be used to characterize groups of students related with various dropout risk degree.
<b>Instructors' teaching performance</b>	There can be different measures to judge an instructor's syllabic execution. Students' input is a well-known measure yet frequently it gives skewed outcomes. It is on the grounds that there is high relationship found between marks of the student and feedback of the instructor. A few DM methods have been utilized in this assignment, despite the fact that association rule mining has been the most widely recognized. Mardikyan and Badur (2012) distinguished elements that influence educators' training execution in college by utilizing stepwise regression and decision tree of data mining procedures. Educator frame of mind, Teacher status, student participation, and students' criticism influence instructing execution.
<b>Curricula Development:</b>	So as to capture what is required by the student and how it very well may be conveyed, different quality tools are utilized. Quality Function Deployment (QFD) is one of them yet it is very tedious procedure to arrive at conclusions. Coloured Petri Nets is a mining tool to meet commonly used for educational plan improvement. Curriculum update has been finished by association rule mining so as to distinguish and comprehend whether educational plan corrections can influence students in a college. Hsia et al. (2008) study course inclinations, fruition rates and calling of enrolees by utilizing data mining calculation, for example, decision tree, link analysis and decision forest. They found the connection between course classification and enrolee professions. They lay emphasis on significance of data mining in building curriculum and marketing in the field of higher education.
<b>Predicting Learners' Placement opportunities</b>	Shreenath Acharya and Madhu N (2012) proposed a model for anticipating students' situation dependent on chronicled data of database which can be used by instructive organizations to uncover some intriguing patterns that could be examined to design their future activities. It has been truly helpful for the higher specialists like Director and Head of the departments.
<b>Learners' relationship management</b>	Analysing learners' data by utilizing data mining procedures is essential for students' relationship management. Data mining methods can be utilized to procure, maintain and hold the learners to accomplish the benefit of an institution or organization.

Classic DM Problems	Educational Example
<b>Classification</b>	Learners' categorizing and profiling and comprehending their learning styles and preferences.
<b>Predictive Modelling</b>	Creating models that can foresee if (and when) a learner will pass a course or not or will graduate or drop out.
<b>Clustering</b>	Grouping similar learners based on behaviour, performance, etc or courses, etc, to discover collaborative learning patterns
<b>Bi-Clustering</b>	Finding which tasks and courses among others are difficult/easy for which type of students.

<b>Frequent Pattern Mining</b>	Identifying elective courses taken together or in-demand behaviour in study programmes or actions in LMS.
<b>Emerging Pattern Mining</b>	Finding patterns that capture significant differences in behaviour of learners who graduate vs. those learners who do not or that explain changes in behaviour of generations over various years.
<b>Collaborative filtering and recommendations</b>	Suggesting suitable learning objective, based on the examination of the performance of other learners, recommending remedial classes for the students.
<b>Visual Analytics</b>	Facilitating reasoning about the educational processes or learning results via interactive data/model visualization, for instance visualizing collaborations.

## CONCLUSION

A great deal of intrigue has been seen in EDM nowadays in light of the fact that a significant number of students are enlisting for higher education. Through EDM institutions, specialists and stakeholders can bring increasing satisfaction among students. Instructive data mining finds its application in descriptive and predictive investigation as well as in prescriptive examination where reasonable activities can likewise be prescribed. Understanding learners, suitable profiling and precise forecasts won't just enhance the quality of instruction but will also in addition create better learning experience.

Due to increasing utilization of web by students today, a large amount of information is accessible about them. Through data mining, valuable data can be separated that can help the education system to plan suitable strategies for students.

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## Organic Products, A Path to Healthy Lifestyle

Prachi A and Sidra U

### ABSTRACT

*In this article, we review and discuss the factors which affect the change in consumer buying behaviour and nutrition they consume. Organic food market is growing rapidly in the country. Consumers have raised great interest to healthy and tasty life with nutritional content and sustainability. Now-a-days, people are indulging in healthy lifestyle in order to avoid lifestyle diseases. In this research paper we are going to discuss the changing patterns of farming, difference in conventional vs organic farming, Consumer perspective and buying behaviour, its influence due to social media, trends in upper class to have dieticians, Increase in fad diets like keto, intermittent fasting etc. If we see, the organic farming produce is growing by leaps and bounds thus giving an impetus to various brands which are coming up for promotion of organic produce. Organic farming practices encourage soil and water conservation, and reduce pollution.*

**Keywords:** Organic farming, lifestyle, fad diets, sustainability, Organic products

### LITERATURE REVIEW

India has a new culture now of being health conscious. Thanks to the exposure of technological development and social media which has become an indispensable part of our lives. If we see, people in India are getting health conscious to avoid the repercussion of bad health afterwards. All these lifestyle diseases occur because of the life style that we are leading. Mostly, if our day is spent with little or no activity except our fingers gliding on the screen of the phone or our eyes gazing at the screen of the phones or our expensive tabs. So there comes up a new market of organic, health conscious & customized food available only for health conscious people.

According to the Global Wellness Institute, **the global health and wellness industry is now worth \$4.2 trillion.**

The industry has been growing with **12.8%** between 2015 and 2017 and represents 5.3% of global economic output.

The Health and Wellness industry encompasses all activities which promote physical and mental wellbeing: from yoga to healthy eating, personal care and beauty, nutrition and weight-loss, meditation, spa retreats, workplace wellness and wellness tourism.

### INTRODUCTION

The term 'organic' refers to how certain food is grown naturally or what natural processes are used to grow the farm produce. It is grown without the use of chemicals and pesticides. In order to be considered organic, animals & plants products can be used as fertilizers which comprises of excellent manure for the farm produce and also give a boost to the plants or farm growth.

If we want organic milk the cattle should not be fed antibiotics or other growth hormones. They should be fed 100% organic feed ration that can include forages from land in your farm production plan that is being managed organically.

If we see, organic products which we are bragging about it all day and many film stars boast that they indulge only in organic products. It is not a new system or a fad. India has been following the organic trend since ages. Now, due to innovation and technological advancement we have started using chemical fertilisers and other things which has a negative effect on us and as environment as whole. So, since these fertilizers have caused many ill health so again people want to switch to the roots. Organic farming is cultivating the crops and raising the crop in such a way that it keeps the soil alive and in a good health. So the organic waste includes crop, animal and farm wastes, aquatic wastes) and other biological materials along with beneficial microbes (biofertilizers)

As per the definition of the United States Department of Agriculture (USDA) study team on organic farming "organic farming is a system which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc) and to the maximum extent feasible rely upon crop rotations, crop

residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection”

FAO suggested that “Organic agriculture is a unique production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity, and this is accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs”.

## OBJECTIVE

- Why people are opting for healthy lifestyle
- Increase in the consumption of organic
- Is healthy eating a fad or a lifestyle?
- To understand the increase in consumption of organic produce or healthy eating diet food

## MAIN BODY

1. **Consumers' awareness and knowledge:** Now- days if we see the trend has changed. Middle class people also are concerned about their healthy lifestyle and as we know to increase the production of food grains and oil. There is lot of adulteration taking place. Since, people have got health conscious. They tend to research on each and every aspect before buying. As we can see the vegetable, fruits, grains and milk that we buy are adulterated. So many people have opted not only organic fruits and vegetables but they have also changed the consumption of edible oil consumption pattern. No-a days if we see people prefer cold pressed oil than the conventional packets that we buy in this stores and for that matter many new companies are emerging for organic milk which provides organic milk to its consumers.
2. **Food safety concern:** Good Agricultural Practices (GAP) are defined "practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products" by the FAO. The aims of the GAP are as follows:

The agricultural production should not harm the environment, agricultural production, the health of human & animal.

- natural resources should not be harmed
- sustainable agriculture,
- The quality and safety of food chain should be given priority.

Now food safety concern, has really become a concern for people as it damages the whole system of food chain and even the safety of health and human are at stake. Food safety is not just restricted to fruits vegetables and grains, it is also essential in case of sea food and meat. So these safety of food should be given priority and should also as organic food is sustainable with no harm to the environment and with little or no residue.

**Consumers' attitudes towards** purchasing organic food is growing among people. Some of the most prominent factors that include the favourable buying behaviour of the customers about buying the organic food includes environmental concern, health concern and lifestyle, product quality. If we talk about environmental concern, Consumers are getting environmental conscious and are also willing to contribute to protect the environment many people those who are obsessed with the nature and rather care about it think to emit less carbon foot print and hence make wise decision of purchasing the organic food. The quality of product again is an important factor and in fact organic food buyers are less price sensitive and are more concerned over the quality than quantity.

**Precautions attitude of today's youth :** Young adults these days are becoming extremely cautious about their health. they are indulging in healthy diets and are giving great importance to fitness. Recently there has been a rapid growth of lifestyle diseases like diabetes, PCOS PCOD blood pressure. Thus in order to avoid such lifestyle diseases people are choosing a healthy lifestyle. They prefer to splurge their hard earned money on gym memberships and expensive organic food as opposed to paying the doctors fee. This has increased the organic food market not just in India, but around the world

**Influence of social media and celebrities:** Today we are in the social media era. Instagram Facebook and YouTube has given rise to social media influencers and bloggers. Instagram has also given the opportunity to general public to get a glimpse of the plush lifestyles of celebrities. Celebrities today are all about fitness. This factor has influenced the mass. We have Bollywood personalities like Akshay kumar, Hrithik roshan, Tiger Shroff who are able to influence the mass to a greater extent as compared to others. Bollywood actress Shilpa shetty has a YouTube channel dedicated to healthy Indian cooking using organic produce. We have writers like Rujuta Diwekar who has swooped the youth by her healthy desi eating philosophies. Many bloggers and youtubers like Anjali Mukharjee, Kyla Itsines have also contributed to this cause.

If an individual can't afford to pay a dietician or nutritionist, he can simply acquire knowledge from the internet. There are number of blogs and videos available that have enlightened the consumers on healthy eating and living.

**Increase in fad diets:** Protein only. Carb only. Weight-waters. Atkins. Paleo. Mediterranean. Gluten-free, ketogenic, Intermittent are the fad diets which people follows now a days. People are obsessed with the fad diet and weight loss. These fad diets have gained popularity due to social media. Individuals consult professional dieticians or nutritionist before commencing such diets, or they just make their own diet plan by acquiring information from the internet.

## RESEARCH METHODOLOGY

We have collected the data from various secondary resources like journals, research papers, blogs.

## CONCLUSION & LIMITATIONS

The study highlighted the reasons as to why Indians are buying organic food in the recent years. The findings highlighted the attitude-behaviour of individuals from urban India towards having a healthy lifestyle. This attitude is influenced by various personal factors like environmental concern, health consciousness, food safety concern and organic food knowledge, along with social factors like influence of social media, bloggers and celebrities. Further research can be conducted to analyse the barriers to organic food purchase such as habits, culture, skepticism, lack of knowledge, lack of availability, high price point of these organic produce.

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## A Study on Depression among the Youth With Reference to Stress Factor

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### ABSTRACT

*Depression' nowadays is a common illness universally with more than 264 million people affected due to it. Depression is common among people but some people hardly recognize it. Women, men, teenagers and even children face the problem of depression. Stress is a feeling of emotional or physical tension. It can come from any event or thought that makes you feel frustrated, angry, or nervous. The stress amongst the youth, attracts wide attention from the society because it creates mental illness for them. The stress is one of the reasons for depression amongst the youth. In this paper, authors studied the depression faced by the college students and the employee up to the age of 30 years. This study mainly focuses, factors contributing to stress, impact of stress on their behavior, how stress is handled by youth and the relation between stress and depression. The authors used primary data for the study.*

*Keywords: Stress, Depression, Youth, Mental illness*

### INTRODUCTION

Depression is a mood disorder which lasts for more than two weeks. Mood disorder is different from mood fluctuation, which people face in their everyday life. It can also be said to be a state of mental illness. Stress can cause depression or anxiety disorders if left untreated, while depression can cause suicidal thoughts if left untreated. Depression as described by Pinette (2003) is caused by a combination of factors such as hormones, sleep habits, heredity, and chemical imbalances within the brain. Depression changes people's behaviour, their attitude which leads to the physical and mental health disorder. Depression is diverse from usual mood variations and short-lived emotional responses to challenges in everyday life. It can cause the affected person to suffer greatly and function poorly at work, at school and in the family. At its vilest, depression can lead to suicide. Close to 800 000 people die due to suicide every year. Suicide is the second leading cause of death in the age group of 15-29-year-olds.

The World Health Organization (WHO) reported that of all illnesses, depression is the leading cause of ill health and disability worldwide. Depression affects the student's concentration in their studies, an Employee's ability to work, and also affects the interpersonal communication. A study conducted for the NCMH (National Care Of Medical Health), states that at least 6.5 per cent of the Indian population suffers from some form of the serious mental disorder, with no discernible rural-urban differences. Though there are effective measures and treatments, there is an extreme shortage of mental health workers like psychologists, psychiatrists, and doctors. The average suicide rate in India is 10.9 for every lakh people and the majority of people who commit suicide are below 44 years of age.

### SIGNIFICANCE OF THE STUDY

The primary concern of this research is to study the causes of stress amongst the youth and how stress leads to depression. This study will elaborate how it affects the mental as well as physical health of an affected person. Most of the people are unaware that they are suffering from depression and most of them ignore these symptoms casually, which results in serious health problems. When a person is suffering from depression, he or she cannot take even a simple decision, and is always under a negative frame of mind. The main aim of the study is to create awareness among youth.

### LITERATURE REVIEW

**Hong Ji and Lei Zhang (2011)** this study reveals about the physical and mental illness of a student facing the current situations in the world. Absence from college or suicidal thoughts are due to their mental depression. This study elaborates on the stress because of the academic and social factors. In this study, they made an analysis on four aspects, i.e., study conditions, employment situations, economic conditions, and personal

factors. Personal factor is further divided into three main parts interpersonal communication, self-care ability, and family condition. Financial issues, inferiority complex is also some of the factors which effects the mental health. **Narasappa Kumaraswamy (2012)** Mentioned in their study, the students get more depressed when they can't find a solution to their actual problem. They suggested in their study that the teachers should have a good relationship with the students to help them come out of fear. The teacher can be a good advisor, mentor to the entire student fraternity, especially the first year newly joined ones.

**Cheng Kai-Wen (2015)** this study focuses on how to handle the depression of the students. When a student can't accept failure, it leads to a mental stress and a sudden change in their behavior. A survey has been conducted in Taiwan, where it was revealed that 84.2% students experienced depression. **Tapas Karmakar and Santosh Kumar Behera (2017)** This study explored on depression among the college students. Research survey on college student's reports said that there will be 10 to 20 % of student population suffering from psychological problems (Stress, Anxiety & Depression. It is also found that there is significant difference that exists between Rural and Urban College students with regard to depression.

The above studies show that lots of study has been carried out separately for stress and depression. The authors found more studies were carried among school and college students. But no study was conducted on youth and the impact of stress on depression. Hence the present study is focused on youth and the impact of stress on depression.

## RESEARCH OBJECTIVES

- 1) To identify the various predominant factors contributing to stress among youth.
- 2) To assess the behavioral pattern of youth towards stress.
- 3) To find out if there exists depression among youth in Mumbai due to stress

## HYPOTHESES

- 1) **H<sub>01</sub>:** There is no significant difference between the stress experienced by male and female.
- 2) **H<sub>02</sub>:** There is no significant relationship between stress and depression experienced by youth.

## RESEARCH METHODOLOGY

The study is based on analytical. The target population of the study is youth and for this study college students and youngsters up to the age of 30 is considered as youth. Area of the study is Mumbai. Primary as well secondary data are used. Judgmental and Convenience sample is used to collect the data from youth. The sample size is 102 and the same was collected through questionnaire. Secondary data are collected from various journals, article and websites. The data collected during November 2019 to January 2020. Statistical tools like frequency distribution, Percentage and Chi-square for hypothesis test are used to analysis the data. SPSS version 25 is used to analyze the data.

## ANALYSIS AND RESULT

### 1) Socioeconomic Profile of the Respondents:

**Table 1: Socioeconomic Profile**

Particulars	Categories	Frequency	%	Particulars	Categories	Frequency	%
Age Group	18-23	64	62.7	Occupation	Student	52	51.0
	24-30	38	37.3		Employee	42	41.2
Gender	Male	45	44.1		Business	1	1.0
	Female	57	55.9		Other	7	6.9
Marital Status	Married	16	15.7	(Source: Primary Data)			
	Single	86	84.3				

Table 1 shows the summary of respondent's details with respect to gender, age, occupation, and marital status. For easy understanding purpose, this is expressed in terms of frequency and percentage. 62.7% of the respondents are belongs to 18 to 23 age group. 55.90% of the respondents are female and 44.10% are male. Majority of the respondents are students i.e 51%. 84% of the respondents are unmarried.

## 2) Stress Experience:

**Table-2: Stress Experience among Youth**

	Frequency	%
Never	6	5.9
Some Times	61	59.8
Many Time	25	24.5
Nearly Everyday	10	9.8

The frequency table 2 clearly shows that around 94% of the respondents are experiencing stress. Out of that 60% of youth have experienced some times and around 25% of youth have experienced many times. Around 10% of the youth have been feeling the stress every day. This indicates that one in every 10 is facing the stress every day and 1 in 4 facing many times and 1 in 2 facing the stress sometimes.

**Table-3: Chi-Square Tests**

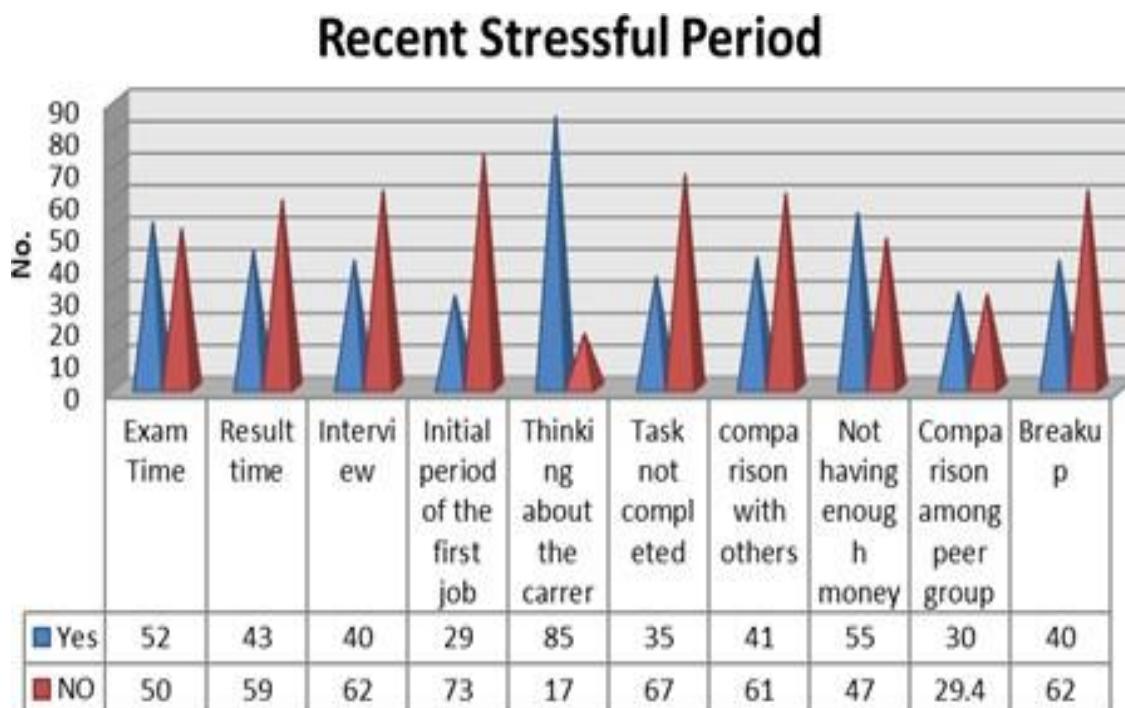
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.923 <sup>a</sup>	3	.008
Likelihood Ratio	14.416	3	.002
Linear-by-Linear Association	3.718	1	.054
N of Valid Cases	102		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is 2.65.

It is observed from the result of Chi-Square in table 3, the calculated *p* value is .008, which is less than .005 (at 5% level of significance). As the *p* value is less than .005, the null hypothesis (H<sub>1</sub>) is rejected. Hence it can be inferred that there is a significant difference between the stress experienced by male and female

## 3) Recent Stressful Period:

This chart clearly shows that more than 83% of youth have stress while thinking about their future career. Next to that they felt stress for not having enough money which means economic background of the family and during exam time. Only 28.4% of the youth, faced stress only during the Initial period of their first job. Positive sign about youth is more than 70% of the youth did not face any stress due to Comparison among peer group and more than 60% of them did not face any stress during interview, and also when the task is not completed as per the schedule, Breakup from Lover or Friend, and Comparison with others by Parent/Teacher/Officer.



## 4) Reason for Stress

**Table-4: Reason for Stress**

Reason	Minimum	Maximum	Mean	Rank	Reason	Minimum	Maximum	Mean	Rank
Parent / Family Pressure	1.0	7.0	3.559	10	College Work	1.0	7.0	3.990	7
Friends Circle	1.0	7.0	4.265	1	Financial Status	1.0	7.0	3.804	8
Lover / Spouse	1.0	7.0	4.186	2	Inferiority Complex	1.0	7.0	4.000	6
Illness	1.0	7.0	4.059	5	Lack of self confidence	1.0	7.0	3.725	9
Lack of social Life	1.0	7.0	4.137	3	Others	1.0	7.0	4.118	4

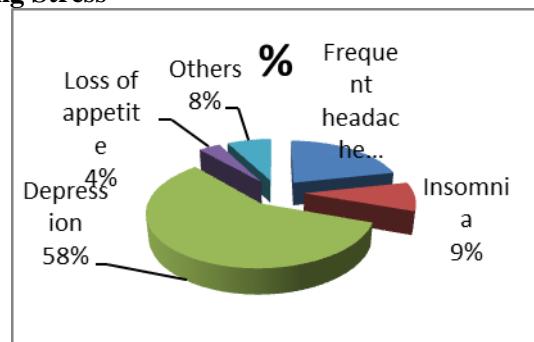
(Source: Primary Data)

The top reason for stress among youth is due to friend circle, next to that is lover or Spouse followed by is Lack of social life which shows that social life helps to avoid stress. In the fourth place, others are there and next place is illness which shows that youth are suffering from sickness, disease or weakness. The subsequent reasons are inferiority complex i.e. about their beauty, skin tone etc., College work, financial Status, Lack of self confidence and pressure from parents or family.

## 5) Symptoms of Stress

**Table 5: Symptoms during Stress**

Factor	No.	%
Frequent headache	22	21.5
Insomnia (inability to sleep)	9	8.8
Depression	59	57.84
Loss of appetite (no interest to eat food)	4	3.8
Others	8	7.7
Total	102	100



(Source: Primary Data)

The above table shows about the students experiencing the stress and their symptoms. The highest percentage is 57.84% suffering from depression followed by frequent headache and insomnia. It clearly shows that more youth are nowadays having the problem of depression. When they are not able to complete the project, which is assigned to them on time or when they are not able to fulfill their desires as per the expectations, then they experience stress. The stress is highest among the youngsters and this leads to loss of appetite and poor health.

## 6) Behavior during Stress

**Table 6: Behavior during Stress**

Factor	No.	Percent	Factor	No.	Percent
Feeling bad	21	20.6	Not doing anything	43	42.2
Feeling ill	4	3.9	Not having proper sleep	11	10.8
Loneliness	5	4.9	Quick anger	8	7.8
Loss of appetite	7	6.9	Suicidal thoughts	1	1.0
No focus on work/ study	2	2.0			
Total				102	100

(Source: Primary Data)

This table shows how youth behave during stress. The highest percentage is 42.2% were people won't do anything during stress followed by feeling bad and not having proper sleep. Other strategies are loss of appetite, loneliness and quick anger. Few respondents are thought of not interested in work and have suicidal thoughts.

## 7) Strategies used to Handle the Stress

The different strategies used by the youth to maintain the stress level are, the highest rank (39.2%) shows that most of them talk to their friend when they are under stress. Next to that, 22.5% do window shopping or go for shopping to feel free from stress. The rest of them listen to music, meditation, sleeping and using internet etc., to reduce stress.

**Table-7: Strategies used to Handle the Stress**

Factor	Frequency	%	Rank
By sleeping	7	6.9	5
By having favourite food	2	2.0	6
Talking to friends	40	39.2	1
Watching movie	1	1.0	8
Listening Music	16	15.7	3
Interaction through social media	2	2.0	6
Meditation	8	7.8	4
By shopping or window shopping	23	22.5	2
Others	3	2.9	7
	102	100	

## 8) Relation between Stress and Depression

66.7 % of the respondents said that they have experienced depression. The table clearly shows that the person who experienced stress many times and every day faces depression also. 60% of the person who experienced stress faces depression. The respondents are asked to score for what matter they bothered. The average score of the respondents on experiencing botheration of different problems is 8.37. This score is calculated by using the score sheet of PHQ (Physical Health Questionnaire). This score i.e. 8.37 indicates that youth are experiencing mild depression. The score is less than 9, so as of now there is no need of treatment for depression. If the individual score crosses 9, then that person has to go for depression treatment.

**Table 8: Stress Vs Depression**

	Experienced Depression		Total
	Yes	No	
Experienced any stress	Never	0	6
	Some Times	37	24
	Many Times	21	4
	Every day	10	0
Total	68	34	102

(Source: Primary Data)

**Table 9: Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	21.372 <sup>a</sup>	3	.000
Likelihood Ratio	26.093	3	.000
Linear-by-Linear Association	17.875	1	.000
N of Valid Cases	102		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is 2.00.

It is observed from the result of Chi-Square in table 9, the calculated  $p$  value is .000, which is less than .05(at 5% level of significance). As the  $p$  value is less than .05, the null hypothesis (H2) is rejected. Hence it can be inferred that there is a significant relationship between stress and depression experienced by youth.

## FINDINGS

- One in every 10 experiences every day and 1 in 4 experience it many times and 1 in 2 experience it sometimes.
- More than 83% of youth have experienced stress while thinking about their future career. Next to that they felt stress for not having enough money and during exam time. Only 28.4% of the youth faced stress only during the Initial period of their first job. In the fifth place of reason for stress is illness which shows that youth are suffering with sickness, disease or weakness.
- The top reason for stress among youth is due to friend circle, next to that is lover or Spouse followed by a Lack of social life which shows that social life helps to avoid stress.
- The impact of stress on health is around 58% suffering from depression followed by frequent headache and insomnia due to stress.
- During the time of experiencing stress, around 42% of the youth are not interested in doing any work. Next to that they are feeling very low and suffer from insomnia.
- Different strategies are used by the youth to reduce their stress. Around 40% talk to their friends when they are under stress to reduce it.
- 6 in every 10 youths experienced depression and the score (8.37) indicates that youth are experiencing mild depression.
- The stress experienced by male and female vary.
- Stress is one of the leading factors for depression experienced by youth.

## SUGGESTIONS

The youth are the future leaders of our nation so it is very important to identify the symptoms, causes of stress among the youth and help them to recovery from it. The suggestions are

- The college committee and the team management of an employee can conduct a regular seminar, workshop and make them aware about the problem that leads to depression. The regular and one to one mentoring session in college/working place helps to manage stress and mild depression.
- The fifth reason for stress is illness which shows that youth should take proper care of their health. For that, they should do regular exercise, yoga, walk and take proper food on time.
- Positive thinking and attitude help to reduce stress and depression.
- The youth should have a good social group which help them be motivated and active in their life

## IMPLICATION AND CONCLUSION

This study result is applicable to youth in Mumbai. This study clearly states that youth are experiencing stress. Some of the symptoms which are mentioned above are insomnia, poor health. Among all the above factors, the highest rank shows are when they think about the future, having financial problem and poor health. The present study clearly depicted that todays youth have mild depression. There is no need of medical treatment for this depression. In this stage, it can be cured by taking some precaution and guidance by friends/families/experts. So, the youth has to take proper precaution by increasing their self-confidence, social life and proper exercise.

## LIMITATIONS AND SCOPE FOR FURTHER STUDY

The study is applicable only to Mumbai and compared with the population of the study, the sample number is very less. The study also evaluated how stress leads to depression. There are so many factors which leads to depression that can be studied in future. This study focused on the stress factors faced by the youth. The same study can be done in various cities with various age group.

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## An Automated Saline Monitoring System

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### ABSTRACT

In healthcare organization most common providing nutrition in appropriate amount to the patients is by providing saline solution to them. This method is performed manually by nurses and various hospital staff. Due to increase in population and illness have also increased proportionally. Hence it becomes very difficult for a single medical staff to look after every ill person. Thus, this paper has proposed a device which will automatically sense the level of the saline solution present in the pouch and will inform the hospital staff accordingly.

**Keywords:** Saline, Microcontroller, Load Cell, IoT

### 1. INTRODUCTION

An ill person, when admitted in a hospital must undergo a heavy medication. This leads to dehydration and loss of immunity to the patient. So, to maintain the water level and to increase the immunity of the body the patient is hydrated with saline solution.

According to the traditional methodology, nurse or other hospital staff has to check regularly the level of the saline content in the pouch to avoid reverse suction of blood in the infusion pipe and cause any accidents. But due to increase in population the number of patients it becomes very difficult for a staff member to take care of the patients. This mismanagement leads to cause of accident and other fatalities.

While implementing the system, the most important part of this is to detect the level of the liquid. In recent year many researches took place in providing a solution for solving a system in which the amount of saline present in the pouch is detected by using IR-Sensors. Bhaviskar D, et. al. have used 2 IR sensors [1]. First is used to detect the saline level in the pouch and the second sensor is used in the interveinal tube for sending an alert message to the doctor as well as nurse regarding immediate change of the saline bottle. The send IR sensor will also help to automatically stop the air flow through the pipe. Similarly, Shyama Yadav et. al. has used RFID tags to detect the level of saline present in the bottle [4]. Furthermore, Chidgopkar et. al. and Debjani Ghosh et. al. have used load cells to detect the weight of the liquid present in the bottle and the information was send by using Bluetooth technology [2] and by using low cost WiFi Module ESP32 in which MQTT-S protocol was used [5] respectively so that the device will be able to perform the necessary actions required to minimize the accidents. The drip rate can also be controlled automatically by using Volume Measurement algorithm as prescribed by H.A.C. Amarasekara et. al. [3].

### 2. Proposed Methodology

The pictorial description of the propose device has been mentioned below.

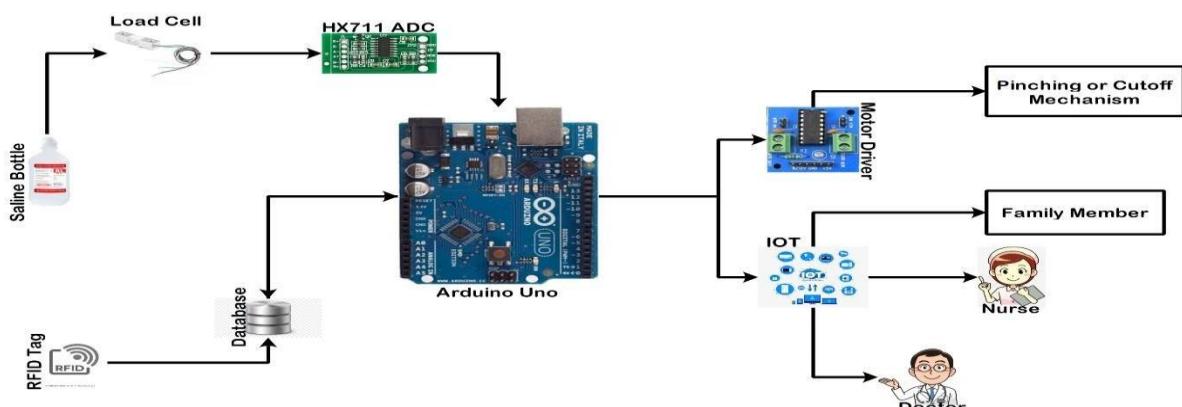


Fig-1: Block Diagram

The weight of saline bottle is detected continuously by using load cell. The output of the load cell is analysed by a microcontroller and the weight of the bottle is less than threshold value then an alert message will be sent to the hospital staff and attender. To maintain more robustness the messes will be sent to concerned persons for avoiding confusion. The database is updated by scanning the visitor's card.

### 3. Hardware Requirement

To implement the system, it is necessary to select the appropriate hardware which would make a system more cost effective and easy to deploy.

#### 3.1 HX711 Module

This module is used to interface load cell with Arduino controller. Being analog in nature HX711 helps to convert the analog signal to digital signal as it is a 24-bit ADC. The weigh of the object is converted to the voltage value.

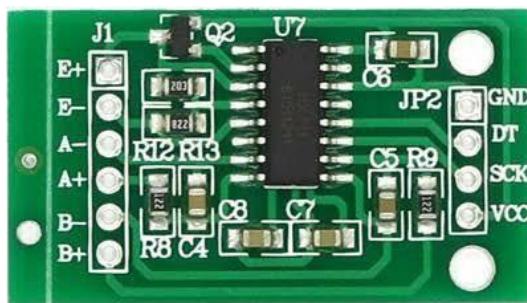


Fig-2: HX711

#### 3.2 Load cell

It is most important part of the system because it will help to detect the weight of the saline bottle and will send signal to the microcontroller as soon as the weight is less than the threshold value. It is a transducer which converts the force, pressure or torque into an electrical signal which is converted into digital signal by HX711 and send to the controller for fater required procedures.

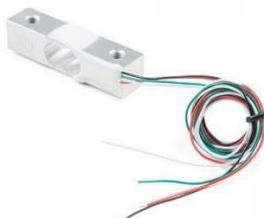


Fig-3: Load Cell

#### 3.2 Arduino Uno

It is the heart of the system which will help to manage the whole working by itself and also will make the system smart. It will take the input from the load cell and will enable the cutoff mechanism to stop the air flow in the interveinal pipe. It is commonly used controller which has 14 types of I/O pins among which 6 pins are analog I/O pins and rest of them are considered as digital I/O pins.



Fig-4: Arduino UNO

## 3.2 RFID card

A radio frequency identification embedded in a card of the visitors or attenders of the patient. It will be used to update the database automatically. The database will have an information regarding the nurses and doctors serving and diagnosing the patients respectively. Apart from the information of the visitor or attender present in the hospital.



Fig-5: RFID

## 4. CONCLUSION

The above system will help from a smarter system and will reduce the manual work required by the medical staffs for the patients. It will also help the medical staff to provide more smooth and efficient services to a large number of the patients. This system can also be deployed in home of the patient and can be used without getting admitted for week in hospitals. The inclusion of IoT have enable the system to have a communication with the desired person through cloud. The dynamic databased updation have made the system more local and easier to approach.

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## Impact of Technology on Cost Effective Solution Human Resource Solution in Small & Medium Enterprises in Thane Region

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### ABSTRACT

*SME's (Small and Medium Enterprises) share in GDP is 8% in India. Its contribution to employment is 22%, according to a Forbes report published in July 2018. What the segment is lacking is the adoption of technology on a large scale. Most of the time, SMEs presumes technology adoption in their business execution is a costly affair; however, it's not always. This paper discusses how issues of human resource are addressed in Indian small and medium enterprises (SMEs). It also highlights the indigenous approaches to human resource management (HRM) that have surfaced in the Indian SME context. This paper covers that there is need to provide Information Technology assistant to reduce cost of HR in SMEs for improving the profitability of SME.*

*Keywords: Sme, Hr, Technology, Cost Variable, Efficiency And Productivity*

### 1. INTRODUCTION

Improvements in human resources (HR) practices and technology are a key reason for the continuous rise of India's technology sector. However, the growth of the tech sector is having its own impact on HR as well. It may be noticed that the ordinary application adoption in giant corporations beyond the Admin function is around 61%, while in mid-sized organizations it is 55%, and even reduce at 48% of small businesses. This indicates the pinnacle-room to be had for HR Tech solution vendors in all companies as a rule and SME in special. The document extra reveals that nearly 40% of businesses are either evaluating to replace or changing most HR technology options and the essential factor driving these substitute is 'user experience'.

Another trend that's observed within the SME sector concerning HR technology is the demand and adoption of mobile-first for use of HR technology, notably in science IT and technology-enabled businesses. Many business and HR leaders at the present point out their proclivity for wanting a mobile-first procedure mainly within the HR tech implementation except for functions like payroll, attendance, leave and travel application processing.

Small and Medium-sized Enterprises (SME) are recognized as a significant part of the both developed and developing economies. For developing economies like India they are especially important as SMEs play vital role in poverty reduction through employment generation. In the past, HRM research focused mainly on large firms but of late, researchers have taken due cognizance of HRM in SMEs. At present, information technology is widely used in various areas of Human Resource Management. Nowadays, more and more SMEs have started to use information technology in their Human Resource Management functions to optimize them management and improve their efficiency. This paper explores the role of Information Technology (IT) in HRM precisely in the recruitment function of the small sized enterprise under study.

### 2. REVIEW OF LITERATURE

**Researcher has also covered some research literature to support the data taken in the study paperf.**

1. Stahl et al., (2012), examined the extent of use of IT in various small and medium business organizations in Brunei Darussalam. Their study attempted to assess the depth and breadth of IT usage in business. They concluded that the chief executive's computer knowledge is positively associated with the use of IT and that businesses in different sectors have different information processing needs.
2. According to Gupta & Singhal (1993), companies are not accidentally creative or innovative but they know how to effectively & creatively manage the human resources. Also if technology is being used in a proper & effective way it helps in the growth of the organisation in a systematic manner.
3. According to Laursen, it is unlikely that new innovative HRM practices will be equally effective across different sectors. The key areas of their analysis include recruitment and selection, pay and benefits,

training and development, employee relations with emphasis on key HRM strategies. These may be taken as evidence of the fact that the impact of IT on HRM functions may show differences between sectors.

4. Appelbaum (2001), Human resource management practices is the management of people within the internal environment of organizations, comprises the activities, policies, and practices involved in planning, obtaining, developing, utilizing, evaluating, maintaining, and retaining the appropriate numbers and skill mix of employees to achieve the organization's objectives.
5. Khan & Chahar (2010) revealed that in energetic business atmosphere, there is a need of an approach to achieve better performance, to originate and implement HRM practices. In considerable and insubstantial extent the organizations need to invest in such practices to get a competitive advantage.

### 3. SIGNIFICANCE OF THE STUDY

The present study encompasses the different dimensions of Technological advancements in HR department in SMEs with special reference to Thane region of Maharashtra, India.

- 1) There is no sufficient study or research done on impact of technology on HR.
- 2) There is a need to study factors affecting the growth of SMEs due to usage of advance technology.
- 3) The study will provide valuable insights to other SMEs who are looking for solving HR related problems.

### 4. OBJECTIVE OF THE STUDY

Researcher has designed following core objectives for the study:

- 1) To understand the role of technology in HR to minimize the overheads to maximize profitability of SMEs.
- 2) To understand the role of technology in HR to improve growth & progress of Small & Medium
- 3) To provide effective solution based on the observations and findings of the study to other SMEs.

### 5. DATA ANALYSIS

**Table-1: Age of the respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 30 years	68	15.0	15.0
	31 to 40 years	186	41.2	56.2
	41 to 50 years	132	29.2	85.4
	51 to 60 years	43	9.5	94.9
	Above 60 years	23	5.1	100.0
	Total	452	100.0	

Age of the respondent is one of the main criteria to understand the result of the study problem. 15% respondents are below 30 years of age, 41% respondents are between the age group 31 to 40 years, 29% respondents are between the age group 41 to 50 years, 10% respondents are between the age group 51 to 60 years, 5% respondents are above 60 years of age.

**Table-2: Educational Qualification**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High-school	21	4.6	4.6
	Diploma	186	41.2	45.8
	ITI	193	42.7	88.5
	Graduate	28	6.2	94.7
	Post-Graduation	24	5.3	100.0
	Total	452	100.0	

4.6% respondents have high-school as their highest educational qualification, 41.2% respondents have diploma as their highest qualification, 42.7% respondents have ITI as their highest qualification, 6.2% respondents have graduate as their highest qualification, and 5.3% respondents have post-graduation as their highest qualification.

**Table-3: Nature of Ownership**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sole Proprietor	117	25.9	25.9
	Partnership	239	52.9	78.8
	Subsidiary	96	21.2	100.0
	Total	452	100.0	

25.9% responding SMEs operate as a sole-proprietor, 52.9% responding SMEs operate as a partnership firm, and 21.2% responding SMEs operate as a subsidiary firm.

**Table-4: Annual Turnover**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 10 Cr	13	2.9	2.9
	11-50 Cr	138	30.5	33.4
	51-100 Cr	192	42.5	75.9
	101-500 Cr	86	19.0	94.9
	501-1000 Cr	23	5.1	100.0
	Total	452	100.0	

2.9% responding SMEs have their annual turnover less than INR 10 Cr, 30.5% responding SMEs have their annual turnover between INR 11-50 Cr, 42.5% responding SMEs have their annual turnover between INR 51-100 Cr, 19% responding SMEs have their annual turnover between INR 101-500 Cr, 5.1% responding SMEs have their annual turnover between INR 501-1000 Cr.

**Table-5: Strength of Employees**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-100	67	14.8	14.8
	101-200	119	26.3	41.2
	201-500	193	42.7	83.8
	501-1000	56	12.4	96.2
	>1000	17	3.8	100.0
	Total	452	100.0	

14.8% responding SMEs have their employee strength between 0-100, 26.3% responding SMEs have their employee strength between 101-200, 42.7% responding SMEs have their employee strength between 201-500, 12.4% responding SMEs have their employee strength between 501-1000, 3.8% responding SMEs have their employee strength more than 1000.

**THE ABOVE STUDY IS BASED ON THE PRIMARY DATA COLLECTED THROUGH SMEs TO UNDERSTAND THE ROLE OF TECHNOLOGY IN MINIMISING COST TO IMPROVE THE BENEFITS OUT IT. RESEARCHER HAS TAKEN FEEDBACK FROM SMEs ON THE BASIS OF DIFFERENT DEMOGRAPHIC FACTOR TO THROW LIGHT ON THE COST VARIABLES AS MAIN HURDLE OF SMEs. THIS STUDY WILL ALSO HELP SMEs BY IMPLEMENT AND USING TECHNOLOGY TO OVERCOME SUCH HURDLES. HENCE THE RESEARCHER HAS PROVED ALL OBJECTIVES MADE IN THE RESEARCH PAPER.**

## 6. LIMITATIONS OF STUDY

The study suffers from certain limitations:

1. Distance was the biggest constraint while conducting research.
2. Absence of detailed HR manuals in SMEs was one of the biggest constraints.
3. The findings are based on the ability of respondents to inquire of the researcher and if respondents are not given their true information it leads marginal error.
4. Owners are willing to give interview but reluctant to provide enough data related to financials like turnover, spent, etc. and impact of technology on their financials.

## 7. SUGGESTIONS

During the selection process not only the experienced candidates but also fresh candidates should be selected so as to avail the innovation and enthusiasm of new candidate.

- 1) As it is a start-up and attrition rate is high, selection of candidate should be done carefully and systematically.
- 2) Company requires systematic planning because candidates are selected first and then job post is created. Moreover at times candidates are selected and called for work but they do not have sufficient work to allocate them.
- 3) The job description should mention the other scope of work that might come up in future.
- 4) Right person should be employed for the right job because Job Misfit is one of the reasons for attrition.

## 8. CONCLUSION

Every company is different with a different set of requirements. Yet HR remains the core pillar that ensures the ethos and drives the culture of all functioning. Therefore, implementing HR tech software is one of the most efficient way that must be adopted to sustain maximum ROI, recognition, and retention for the SMEs in India. Every SME in India should adopt technology to enhance their HR performance for their wellbeing and economic development. It will also increase the share of SMEs in export, enhance image, market performance, efficiency, for entering in the new projects, to provide employment etc.

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## Students Perception while Selecting Education Institutions for P.G. Courses

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### ABSTRACT

*College rankings are increasingly disseminated with great detail about the different components of the overall score, and the “stories” that frequently accompany the presentation of the overall position of an institution often refer to the general climate on campus and to the level of satisfaction of the students. In a narrower sense, measures of student satisfaction have long been used to assess the effectiveness of different college services (e.g. housing, student life, financial aid) and programs (e.g., programs dealing with special student populations such as commuters, adult learners and international students). This paper has been prepared with an objective to understand students’ perception about the service quality of business institutes/universities and to assess the significant determinants of service quality for business institutes/universities in India.*

*And also analyze is there any significance difference of service quality perception in male and female students. Primary data was collected through a self-designed questionnaire based on Rank Scale.*

### INTRODUCTION

Institutions of higher education are increasingly realizing that they are part of the service industry and are putting greater emphasis on student satisfaction as they face many competitive pressures. On the one hand, student satisfaction has been related to recruitment and retention and academic success which has lead university administrators to pay great attention to those factors that help them to more effectively attract students and create a supportive learning environment.

Administrators and educators also recognize that understanding the needs and wants of students and meeting their expectations are important to develop environments in which students can learn effectively Furthermore, psychologists have found that student satisfaction helps to build self-confidence, and that self confidence helps students develop useful skills, acquire knowledge, and become more confident, in what may be described as a virtuous cycle.

Learners use self-regulatory attributes to control their personal learning processes and self-efficacy influences choice, efforts, and volition. Successful students seem to have an ability to motivate themselves to complete a task, while less successful students have difficulty in developing self-motivation.

### RATIONALE OF THE STUDY

#### Purpose

The purpose of this Guide is to help higher education institutions make the best use of their student feedback. All institutions collect feedback from their students and in many different forms. They use it to improve the quality of the education they provide. In recent years, there has been a shift in the balance between informal and formal types of student feedback with a greater emphasis on the latter. Thus, as the importance attached to student feedback increases, ensuring that feedback is collected effectively and used wisely becomes an increasing priority for higher education institutions.

### OBJECTIVES

This study has the following specific objectives that would be significant in order To come up with a credible set of data that would the bases for analysis and drawing of the conclusions

- 1) To understand students’ perception about the service quality of business institutes/universities.
- 2) To assess the significant determinants of service quality for business institutes/universities in India.
- 3) To analyze is there any significance difference of service quality perception in male and female students.
- 4) The changing business environment offers challenges and opportunities to the organizations.

5) Excellence in quality has become an imperative for business institutes/universities.

## LITERATURE REVIEW

Cubillo et al., (2006), discussed five factors that most of the student consider while selecting the institute. Three out of them are external and two are internal which directly related to the institute. The external factors were as the personal reasons, previous experiences discussed by the alumni and the location of the program. But the most related to the institute were the image of the institution and the perceived quality of the study programmes. He also suggested that the importance of these internal factors was not ascertained but the institution must maintain their relative image and perceived quality for sustainable competitive position among competitors. Abouchedid and Nasser (2002), said that the service quality to be considered as an unavoidable matter of attention for the successfulness and maintenance of competitive position among the higher education institutes. Oldfield and Baron, (2000), considered the students level of satisfaction as an important source of the institute for the maintenance of its competitive position and financial stability. Berry et al., (1988), discussed that the search of quality and measurement of the perceived service quality satisfaction became an emerging trend for the industry. Most of the service firms were interested in measuring the perceived service quality of the customers

Surjadja et al., (2003), said that the advancement of the technology provided the ability to organization to provide better services to satisfy their educations. Takeuchi & Quelch (1983), said that expectations of the students from the organizations in term of high quality been increased. Smith (2000), commented that in measuring the organizational performance service quality have been considered a significant factor. Gronroos (1982), suggested the two types of services quality as technical service quality and functional service quality. He defines the technical service quality as the quality which related to what the education actually getting from the service and functional service quality which related to the delivery of the services.

Anderson (1995) and Susan (1997), considered the feedback of students very important especially for providing educators the opportunity for the enhancement of quality of services and enabled them to create positive perception in the minds of the students about the Institutes. Sohail et al.,(2003), commented that many college administrators implement the quality practices like as total quality management practices in their institutes to realized the fact that educations of the higher education are being served in appropriate manner.

## RESEARCH METHODOLOGY

### Scope of the study

The study would try to throw some insights into the existing services provided by the institutions and the gap between the students expectations, perceptions and the actual state of performance. The results of the study would be able to recognize the lacunae in the system and thus provide key areas where improvement is required for better performance and success ratio.

### Sources of data collection

Sources of data collection state the various sources of data from where we collect the information's for the comparative analysis.

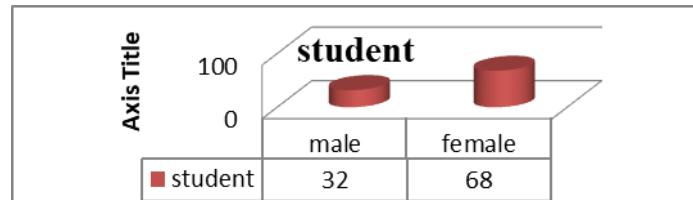
- **Primary Data**
- ✓ It is collected through structured questionnaire by conducting survey.
- **Secondary Data**
- ✓ Books, websites, database at institutions, library research, magazines, news papers

### Sampling plans

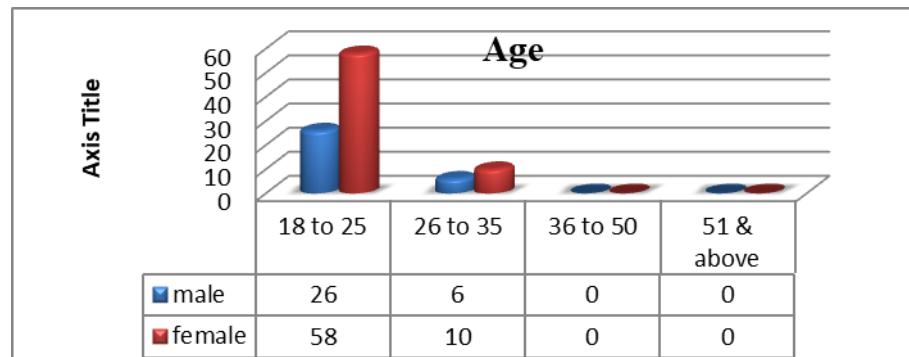
### THE SAMPLE

A sample size of 100 was considered in this project. That is, a total number of respondents were 100 for survey.

## DATA ANALYSIS AND INTERPRETATION

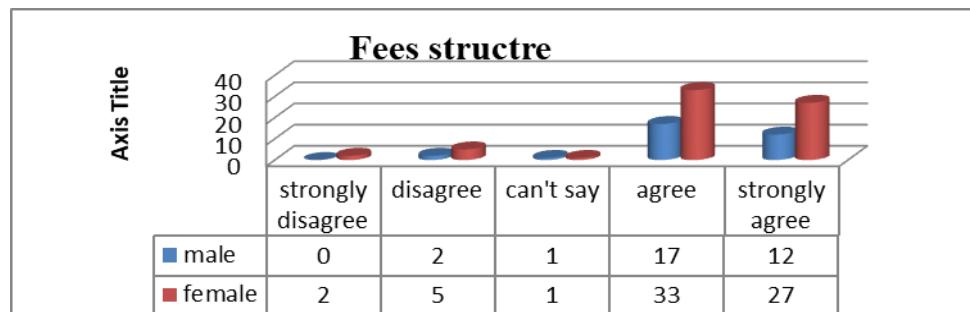


**Interpretation:** As per the above graph, Out of the 100 respondents 32% respondents are male and 68% respondents are female.



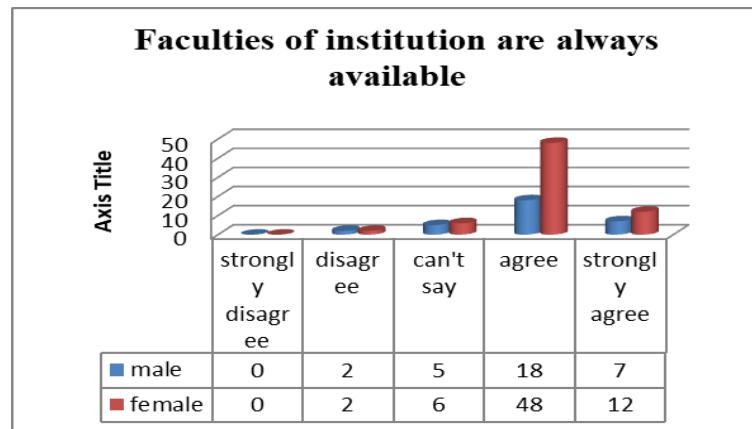
**Interpretation:** As per the above graph, Out of 100 respondents falls under the age category of 18-25 male are 26% and females are 58%, comes under the category of 26-35 male are 6% and females are 10%.

### Fees structure



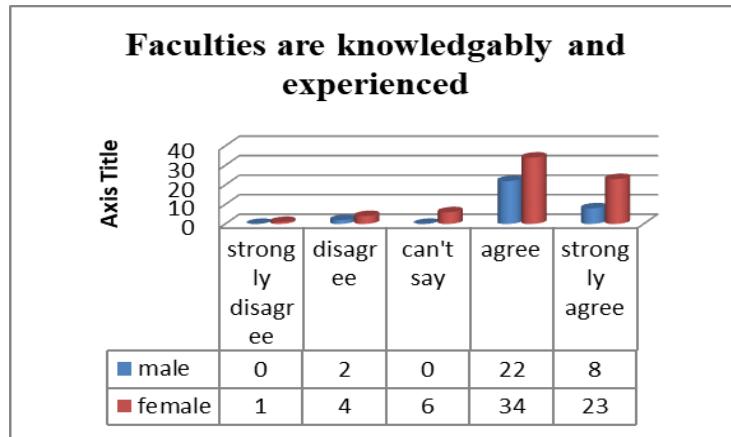
**Interpretation:** As per the above graph, Out of 100 respondents 2% are female are strongly disagree, 5% female and 2% male are disagree, 1% female and 1% male are can't say, 33% female and 17% male are agree, 27% female and 12% male strongly agree with fees structure of the institutes have major impact on choosing institutions.

### Faculties of institution Should available during institutional hours



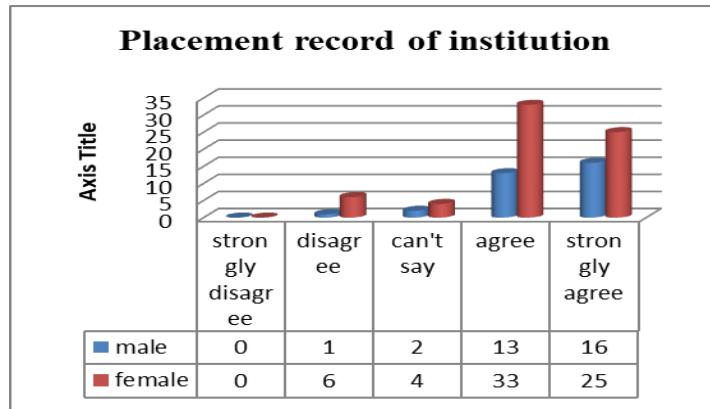
**Interpretation:** As per the above graph, Out of 100 respondents, 2% female and 2% male are disagree, 6% female and 5% male are can't say, 48% female and 18% male are agree, 12% female and 7% male strongly agree with faculties of institution are always available during institutional hours.

### *Faculties Should be knowledgably and experienced*



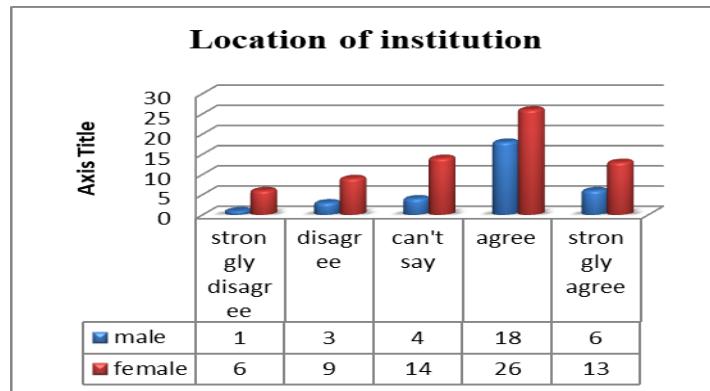
**Interpretation:** As per the above graph, Out of 100 respondents 1% are female strongly disagree, 4% female and 2% male are disagree, 6% female can't say, 34% female and 22% male are agree, 23% female and 8% male strongly agree with faculties are knowledgably and experienced in institutions have major impact on choosing institutions.

### *Placement record of institution*



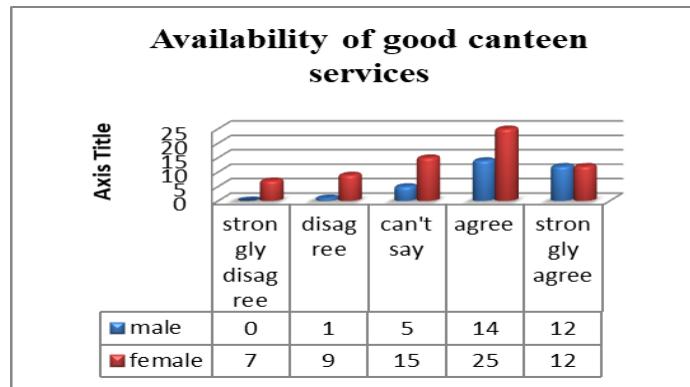
**Interpretation:** As per the above graph, Out of 100 respondents, 6% female and 1% male are disagree, 4% female and 2% male are can't say, 33% female and 13% male are agree, 25% female and 16% male strongly agree with placement records of institution have major impact on choosing institutions.

### *Location of institution*



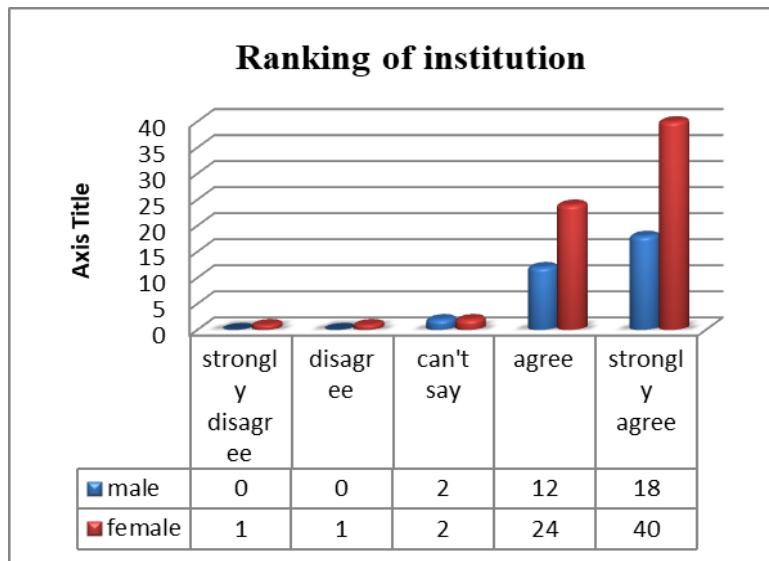
**Interpretation:** As per the above graph, Out of 100 respondents 6% are female and 1% are male are strongly disagree,9% female and 3% male are disagree,14% female and 4% male are can't say,26% female and 18% male are agree,13% female and 6 male strongly agree with location of institutions have major impact on choosing institutions.

### *Availability of good canteen services in institutes*



**Interpretation:** As per the above graph, Out of 100 respondents 7% are female are strongly disagree,9% female and 1% male are disagree,15% female and 5% male are can't say,25% female and 14% male are agree,12% female and 12% male strongly agree with availability of good canteen services institutions have major impact on choosing institutions.

### *Ranking of institution*



**Interpretation:** As per the above graph, Out of 100 respondents 1% are female are strongly disagree,1% female are disagree,2% female and 2% male are can't say,24% female and 12% male are agree,40% female and 18% male strongly agree with ranking of institutions have major impact on choosing institutions.

## **FINDINGS**

- Fees structure plays an important role while selecting educational institution.
- Most of the students are interested in selecting government institute.
- The faculties teaching methods, availability of faculties, experienced faculties also affect the student decision
- Institute is affiliated to which university also affect the student decision.
- Most of the student agreed on the fact that campus size & good placement from the institution also affect the student decision.

- Most of the student agreed on the fact that an institution must have a good library and well equipped lab.
- Most of the student agreed on the fact that apart from studies cultural and sports activity must be done in institute

## LIMITATION AND SCOPE

### Limitations

The Guide records the things that people in institutions have told us work. It does not mean they will work in the reader's own context. Nor does it mean that there is necessarily 'hard' evidence that they actually do work, in terms of enhancing the quality of higher education. But the experiences of large numbers of practitioners should not be discounted.

## SCOPE OF THE STUDY

The study would try to throw some insights into the existing services provided by the institutes and the gap between the students expectations, perceptions and the actual state of performance. The results of the study would be able to recognize the lacunae in the system and thus provide key areas where improvement is required for better performance and success ratio of institutions.

## CONCLUSION

- The results of the analysis indicate that the students have positive perception the service quality of the institutes/universities.
- They agreed with the service quality level provided by the institutes/universities except the quality of food and services level at cafeteria. They are overall satisfied with the service quality provided by the business institutes/universities.
- The service quality determinants as reliability, responsiveness, competence, tangibility and communication are significant determinant of service quality for business institutes/universities.
- There is no significance difference between the male and female students perception about the service quality of the business institutes/universities it is almost the same for male and female students.

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## Predicting Epilepsy using Machine Learning Techniques

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### ABSTRACT

Epileptic seizures occur because of disorder in brain practicality which may have an effect on patient's health. It is vital to predict the epileptic seizures before the start of onset phase in order to prevent seizures by medication. Machine learning techniques have received increasing attention in medical applications. There are numerous Machine Learning Technique and computational methods which are used for predicting epileptic seizures from Electroencephalograms (EEG) signals. However, preprocessing of EEG signals for noise removal is major issue that is been faced which predicting Epileptic seizures. These problems have adverse impact on anticipation time and true positive prediction rate. This review examines the progress made in epilepsy; it highlights the applications in automated seizure detection from electroencephalography (EEG). This paper present commonly used machine learning approaches and challenges faced in predicting epileptic seizures.

**Keywords:** Epilepsy, Electroencephalograms, Machine Learning, Support Vector Machine, Wavelet Transform

### INTRODUCTION

Epilepsy [1] is a chronic disorder in which patients suffer seizures caused by a brain functionality disorder. While more than fifty million people around the world are diagnosed with epilepsy, in the United States, about three million patients have been affected by epilepsy. Epilepsy is the third most common brain disorder [2]. Meanwhile, there are several possible causes of epilepsy, one of which is burst of electrical impulses in the brain escape their normal limits. Although the main cause of epilepsy remains unknown, early diagnosis can be useful for treating epilepsy patients. Epilepsy patients can be treated with drugs or surgical procedures [3]. However, these methods are not fully effective. In these cases, patients cannot independently work and do some activity. This leads to social isolation of individuals and economic difficulties.

Early prediction of epileptic seizures will give enough time to treat the patient and avoid the attack. Epileptic seizures have four different states. First state is the preictal state, which is a state that appears before the seizure begins, second state is the ictal state that begins with the onset of the seizure and ends with an attack, third state is the postictal state that starts after ictal state, and last state is interictal state that starts after the postictal state of 1st seizure and ends before the beginning of preictal state of consecutive seizure. Figure 1 shows different input states of the three different channels. In addition, seizures are often predicted by detecting the beginning of the preictal state

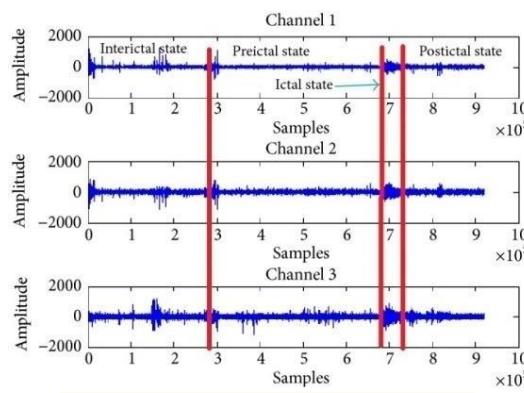


Figure 1: States of epileptic seizure

Detecting the appearance of preictal state [4] will help to predict the seizure. . Therefore, it is important to detect the appearance of preictal state for epileptic seizures. Machine learning model effectively help us to predict epileptic seizures. These machine learning models through which we can predict seizures include an electroencephalogram (EEG), signal acquisition, signal preprocessing, features extraction from the signals, and finally classification [5] between different seizure states. The objective of the prediction model with machine

learning was to detect preictal state's sufficient time before seizure onset starts [6]. Preprocessing is performed for removing noise from the signals and to increase the signal-to-noise ratio (SNR). Many researchers [7] have discussed preprocessing steps that include converting multiple channels of EEG signals into a single surrogate channel, and then filters have been applied to increase the signal-to-noise ratio (SNR).

We have observed in the literature that there is no machine learning model that provides an absolutely reliable method for both preprocessing and features extraction, the review paper discussed about Various Machine Learning technique used for prediction of seizures. There are various model of machine learning used by various Authors that will be discussed in entire paper.

## RELATED WORK

In the previous section, four states of seizures were explained. Out of these four states, ictal state and preictal state are very useful for predicting epileptic seizures. The ictal state can be used to classify seizure and non-seizure EEG (Electroencephalograms) signals. Preictal State begins several minutes before the onset of a seizure, and it ends with the start of ictal state. Many researchers tried to detect the beginning of the preictal state by using EEG signals. Preprocessing of the EEG signal tends to increase signal-to-noise ratios (SNR).

In review, it used only six EEG channels in their proposed model and extracted 22 univariate linear properties. It was assumed by the author that preictal time starts 10 to 40 minutes before the ictal state with a difference of 10 minutes. The prediction sensitivity after applying Machine Learning Algorithm is 73.90%.

Support Vector Machine was used as a classifier to classify the preictal and ictal states of EEG signals. The review papers have used extracted univariate linear features using the window size of seconds in their algorithm. In the second step, preprocessing is done, and finally a decision was made on EEG signal. Data is collected by extracting three EEG channels by placing electrodes on the patient's scalp focusing on seizure, while the three electrodes are located outside the confiscated surface. Then this data of the acquired EEG signals are converted into segments of a non-overlapping window having the size of 5 seconds. After conversion of data, the Butterworth filter was used to reduce the noise effect.

Teixeira et al. in [8] in his research have proposed a model for prediction of epileptic seizures by choosing only six channels of EEG signals and have extracted 22 linear univariate features for each channel. The overall feature space expands to 132 dimensions. The reason behind this minimum electrode selection is to set free the patient from wearing a large number of electrodes, as patients are often unwilling to wear so many electrodes on their scalp due to discomfort. Therefore, in order to give comfort to the patient, only six channels have been acquired and used for prediction purpose

There are two methods for testing, one method is by randomly selecting six EEG electrodes, while the second method is to choose six channels from electrodes which have been placed on the scalp area from where seizures originate. After this step notch filter was used for smoothing as preprocessing step for noise removal. Reviews have used three classifiers for classification and have approximately predicted every seizure.

Training data is fed into Support Vector Machine for training the classifier after which test data is passed for determining classification, accuracy and sensitivity. It is been observed that sensitivity of detecting the seizure is 75.8%, meaning that, out of 87, they have successfully detected 66 seizures

Another method for prediction of Seizures is Wavelet method. In this method Features are extracted including wavelet energy and wavelet entropy. Two or three channels have been selected to conduct the testing on data set of six to seven patients. After testing with wavelet method sensitivity has been calculated as 88% with average anticipation of 22 minutes.

There is another research for predicting seizures using scalp EEG signals on the basis of Zero Crossings. Prediction has been made by computing the histogram of all intervals using moving average window. It selects the values from particular bins of observations. After completing entire process last 5 seconds of observations are compared with different reference set of point containing preictal and interictal states. Similarity index is measured on basis of variational Bayesian Gaussian mixture [9] model of EEG data.

## CONCLUSION AND FUTURE WORK

The aim of this study is to detect epileptic seizure using different Machine Learning Techniques due to which epilepsy-affected patients will get more time for proper medication required for preventing the seizure before it actually occurs.

In the future, preprocessing of the EEG signal can be further improved to get an increased sensitivity of seizure prediction and this would help patients to extended level.

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## Nano Sponge: Real Friend of the Environment

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### ABSTRACT

*There is a continuing interaction of the humans with the surroundings. These interactions have an effect on the standard of life, years of healthy life lived, and health disparities. Environmental pollution can be defined as "the contamination of the physical and biological components of the earth/atmosphere system to such an extent that it will adversely affect the normal life." Environmental health consists of preventing or controlling pollutant from occurring, and mixing with the surroundings. Controlling pollution is one factor and stopping it from intermixing within the surroundings is different. Several efforts are taken for controlling the pollution however once the harmful waste material mixed with the surroundings it became not possible to stop it from inflicting harmful effects therefore efforts should be taken before it mixes with the Environment. Thinking for the same I would like to present the idea of using Nano Sponge for controlling pollution.*

**Keywords:** Pollutant: a substance that pollutes Environment, membrane: a thin sheet of tissue or layer of cells acting as a boundary,

### 1. INTRODUCTION

We have seen it repeatedly that smoke comes from the vehicle's exhaust pipe mixes with the environment. Vehicles are the major contributors to pollution. Air pollution is the presence of unwanted substances in the air that don't belong there, or excessive amounts of certain contaminant that wouldn't harm us otherwise. It happens because cars burn gasoline and they emit pollutants. Gasoline fumes escape into the air even when we pump gasoline into our fuel tanks [1].

According to the study there are four major pollutants:

- An automotive emits carbon monoxide gas once the carbon in fuel that burn partially.
- A car's exhaust emits hydrocarbons.
- When fuel burns, element and gas react with one another and element oxides (NOx) comes as an output.

Maintaining healthy surroundings is extremely vital to extend the standard of life and years of healthy life. Globally, seven million of deaths round the world area unit because of pollution solely [2]

Poor quality environment has its greatest impact on people whose health status is already at risk. Therefore, environmental health must address the factors that increase the likelihood of exposure and disease.



Fig. 1: Statistics Air Pollution

### 2. METHODOLOGY

Now we all understood that it is very important to avoid the blending of carbon within the atmosphere. supported this we've got typical technique conjointly like separating dioxide from flue gas is amine adsorption, but it isn't economical at scale as it adds significant capital cost and reduces the electrical output of power plants. [3]

Scientist developed a new, highly permeable carbon capture membrane. Through which it is possible to separate carbon dioxide from vehicles, preventing the greenhouse gas from entering the atmosphere and contributing to climate change in more efficient way.

The researchers focused on a hybrid membrane that's half chemical compound and half metal-organic framework, that may be a porous three-dimensional crystal with an oversized internal expanse immense quantity of molecules.

Carbon dioxide molecules can travel through the membrane via two distinct channels. Molecules can travel through the polymer component of the membrane, or molecules can flow through "carbon dioxide highways" created by adjacent metal-organic frameworks.

Initial phase test results into two-route approach makes the hybrid membrane eight times more carbon dioxide permeable than membranes composed only of the polymer. It is a big goal in efforts to develop carbon capture materials that are energy efficient and cost competitive. [4]

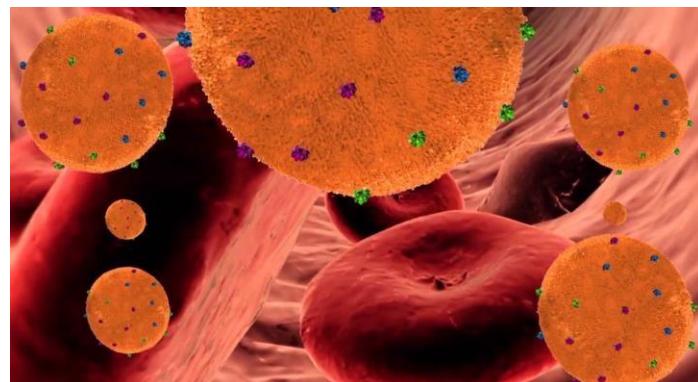


Fig. 2: Nano Molecules

Our plan is to use this feature in cars by implanting this nano sponge within the car's pipeage. By doing this it is possible to prevent carbon from mixing in the Environment not only carbon but other pollutant also. This is same as preventing tea powder from mixing with the tea while serving using sieve. According to the study if pollutant mixes with the Environment for more 15to 20 years it will become impossible for the human being to survive.

### 3. CONCLUSION

The only difference between animals and humans is that animals change themselves for the environment, [5] but humans change the environment for themselves. Much is being done to control, monitor and rectify damage done by pollutants. The pollution problems are of many types, and some are known and some of them are not. But it is important to keep a control over pollutants so that we can maintain the environment in an acceptable condition for our future generations. Nano Sponge is the need of the current world. Its extraordinary features make it as a friend of Environment. Implementing it in vehicles will make a change in the environment.

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## “Study of awareness among working class people in Mumbai region about retirement planning fund.”

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### ABSTRACT

*The present study is an attempt to find out whether provision is made for retirement fund among urban working class people in Mumbai region, the instrument they select to achieve their retirement goal and most importantly the proportion of income they are saving for this goal. Study to find about parameters which they keep in mind while investing in such funds also was assessed. The study has been made by collecting response of urban working class people in Mumbai region through survey monkey response structured questionnaire. A total of 100 respondents were sent questionnaire through Gmail and whatsapp to fill in their responses. 41 people response were collected .The findings was analyzed which reflected there is high penetration in mind of working class for need of retirement fund which they create. About 80 percent are regularly saving but the proportion of saving is merely 10 percent of their monthly income and highest priority is given to traditional method of saving that is fixed deposit, followed by mutual fund retirement plan. Family structure of surveyed people mostly are nuclear with nearly 50 percent consisting of 4 members and most important parameter for selecting an instrument for creating such fund is liquidity, safety, and return. Lastly people are open to meeting financial advisor who can assist them in financial planning. Overall people are investing but they are not saving adequately for this goal.*

### INTRODUCTION

Saving is the mantra for long term happiness and prosperity this is an age old ancient belief. Retirement planning goes well with those who wants to be financially independent and have a happy secured life.

In general usage, a financial plan is a comprehensive evaluation of an individual's current pay and future financial state by using current known variables to predict future income, asset values and withdrawal plans.

Financial planning = Sources of funds+ Utilization of funds

In ancient period man for survival were hunters and gatherers. Each day they had to hunt for animals or gather fruits from tree for their survival. But later civilization emerged where there were food producers or some form of farmer's whose main occupation was to do agriculture and supply goods to all over. Hence once a man gets up today there is food readily available in market which he can easily get which was not the case in ancient period.

Civilization essentially means planning for future, right from day one to reach a specific life goals.

Financial planning is essentially that where you save systematically for creating the fund for your goals of life which can be: Children's education, career, and most important your own retirement funds.

### Objective of the study

1. To find out awareness among working class people on retirement fund planning need?
2. To find out preference of instruments which they invest to make their retirement goal achievable ?
3. To find out are they investing sufficiently for achieving the goal ?

### RESEARCH METHODOLOGY

#### Sources of data

Mumbai being an economic capital with a population of 130 crore citizens it was not feasible to meet each and every person. Hence a questionnaire was sent by Survey Monkey to approximately 50 people and out of which 41 people completed the survey report.

#### Secondary data

The data was collected from various secondary sources like journals, books, newspapers and websites

#### Sample design

For the purpose of study, respondents known were selected on the basis of convenient sampling technique.

Sample size: The sample size consisted of 41 respondents residing in Mumbai region were posed questions through google forms and personal visit.

## **Research Report**

Data interpretation of primary research:

Of the respondents posed questionnaire 60 percent were service 20 professionals, 10 percent retired and 10 percent were doing business.

## **FINDINGS AND OBSERVATIONS**

### **Analysis and interpretation**

Major analysis was around 80 percent of people are saving for their retirement fund but the proportion of monthly income for saving varies, nearly 50 percent are saving less than 10 percent of their salary whereas only 10 percent being cautious save 50 percent of their income. The number of family members mostly in 50 percent cases consist of 4 members whereas family member more than 5 member's percentage was around 20 percent.

Nearly 30 percent prefer fixed bank deposit, 28 percent respondents prefer mutual fund retirement plan for saving instrument, 3rd preference is for insurance retirement plan whereas 12 percent prefer property and 15 percent prefer other instrument.

68 percent of the respondent highly feel they need to save for retirement fund, whereas 22 percent felt probably there is a need for retirement fund whereas 7 percent were neutral and 3 percent felt there is no need for retirement fund.

The major strong reason for planning for retirement fund is to be financially independence which is approximately 83 percent, whereas 15 percent felt saving for retirement is for enjoying retired life. Only 3 percent felt other reason for retirement fund.

A question was posed that if still they didn't plan for retirement would they like to meet a financial advisor to which 30 percent were willing to meet whereas 28 person said most likely whereas around 25 were not likely willing to meet financial advisor.

The final question posed was open ended question asking the reason for financial planning in their own words to which respondents answer was it helps in emergency, life a dignified life and planned future.

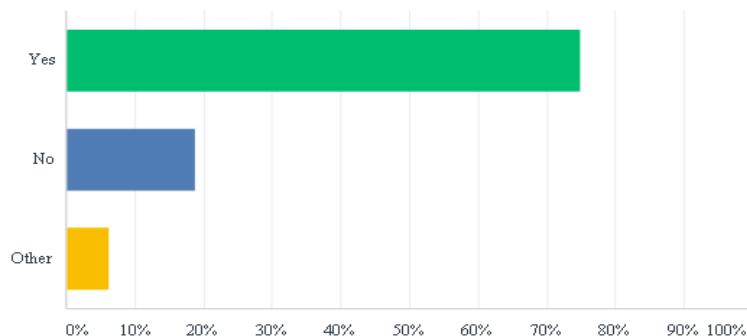
The instrument selection depends on return on investment safety liquidity and risk are major parameters people feel are important criteria which they look before they select any retirement plan.

## **CONCLUSION**

All said and done there is a wave of positive vibes for masses towards need for financial plan but the proportion of saving in relation to income is mere which is a major issue. Traditional saving instrument fixed deposit is first preference choice as that's easy to do and doesn't require any guidance and analysis. Mutual fund retirement is the second choice for saving for retirement. And other avenues like insurance fund slowly gaining confidence in making masses fulfill their retirement life goals.

## Q.1 Are you saving for your retirement fund ?

Answered: 32 Skipped: 0



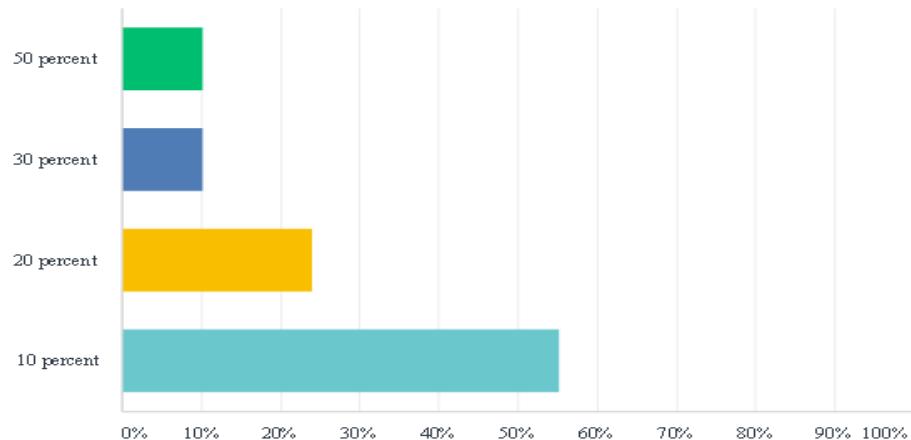
### ANSWER CHOICES

### RESPONSES

Yes	75.00%	24
No	18.75%	6
Other	6.25%	2
TOTAL		32

## Q.2. If yes what proportion of your monthly income you are saving?

Answered: 29 Skipped: 3



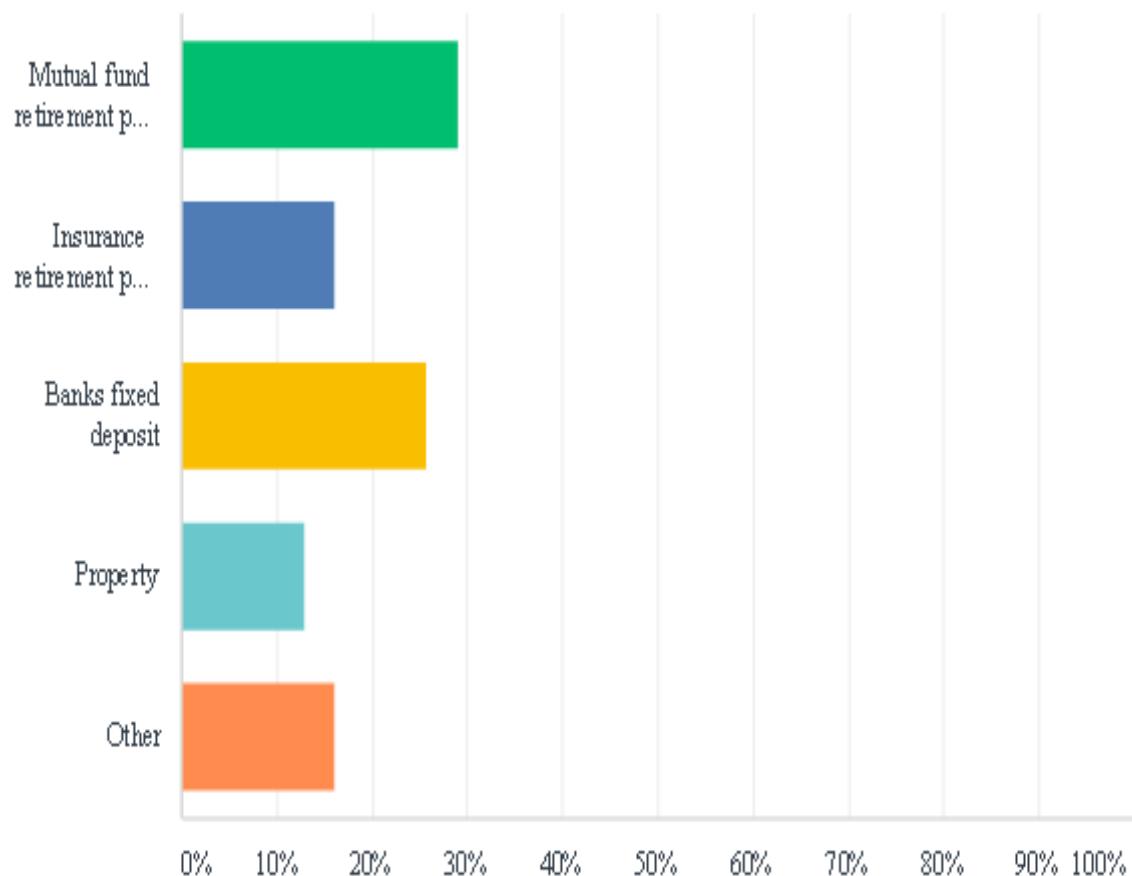
### ANSWER CHOICES

### RESPONSES

50 percent	10.34%	3
30 percent	10.34%	3
20 percent	24.14%	7
10 percent	55.17%	16
TOTAL		29

which instrument you are creating retirement fund?

Answered: 31 Skipped: 1



## ANSWER CHOICES

## RESPONSES

Mutual fund retirement plan	29.03%	9
Insurance retirement plan	16.13%	5
Banks fixed deposit	25.81%	8
Property	12.90%	4
Other	16.13%	5
<b>TOTAL</b>		<b>31</b>

When you think about the retirement fund , do you think of it as something you need or don't need?

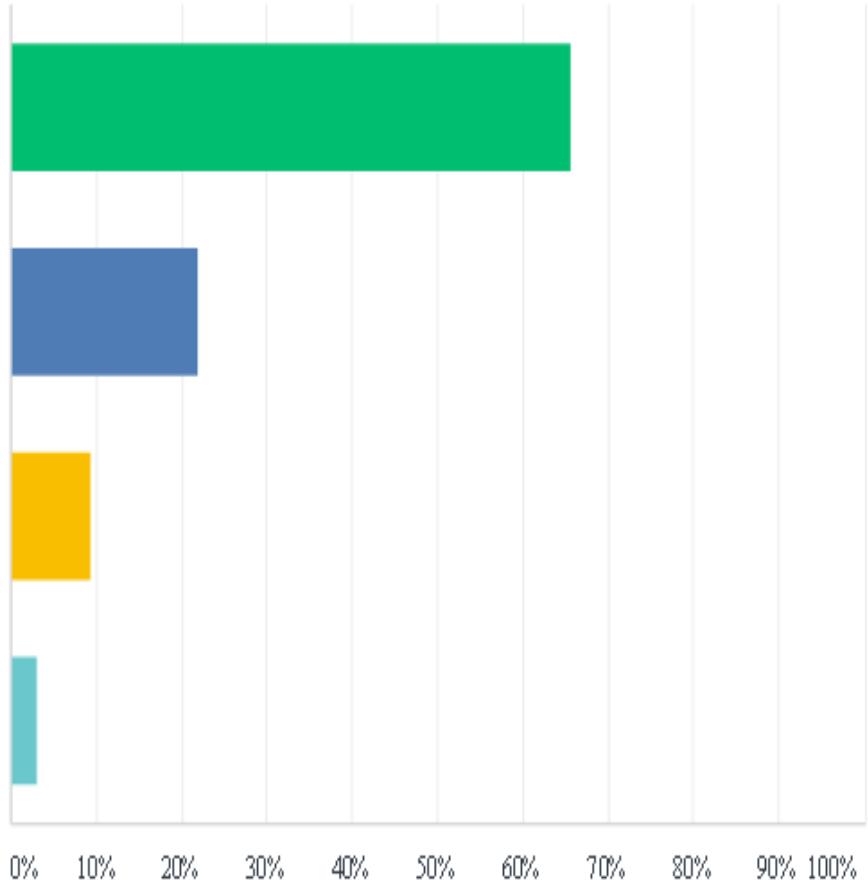
Answered: 32 Skipped: 0

Definitely need

Probably need

Neutral

Probably don't  
need



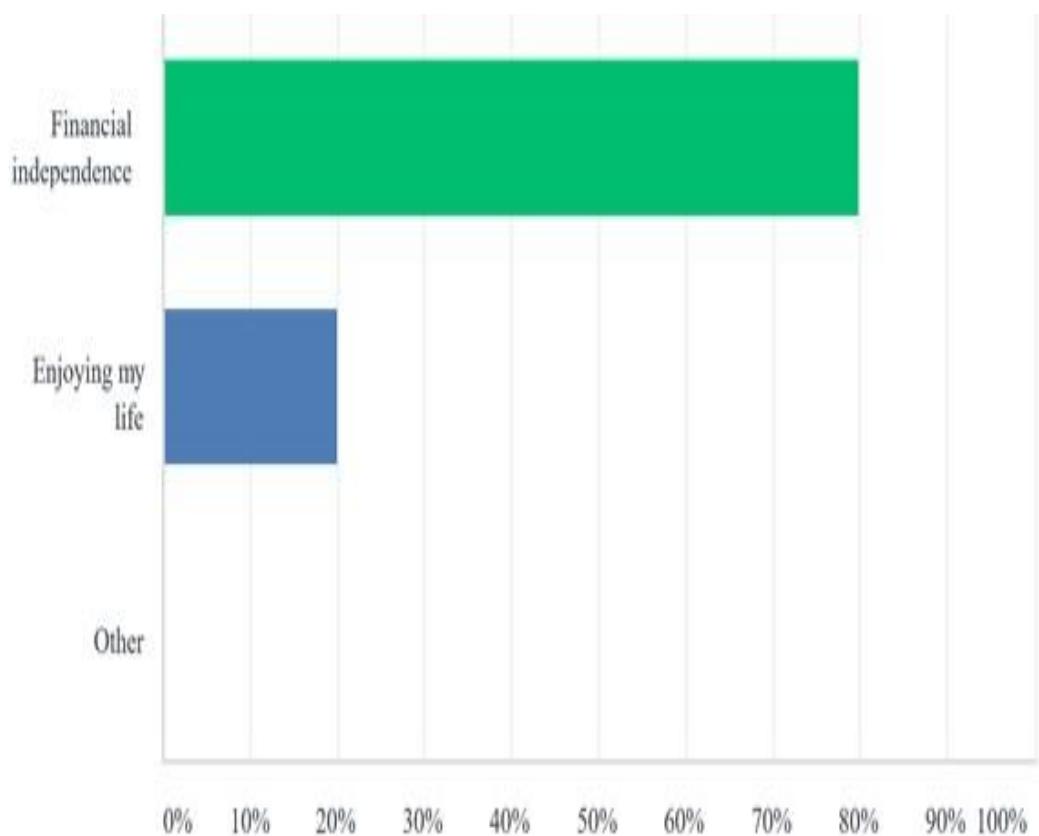
## ANSWER CHOICES

## RESPONSES

Definitely need	65.63%	21
Probably need	21.88%	7
Neutral	9.38%	3
Probably don't need	3.13%	1
<b>TOTAL</b>		<b>32</b>

What u feel makes you to save for retirement fund?

Answered: 31   Skipped: 1



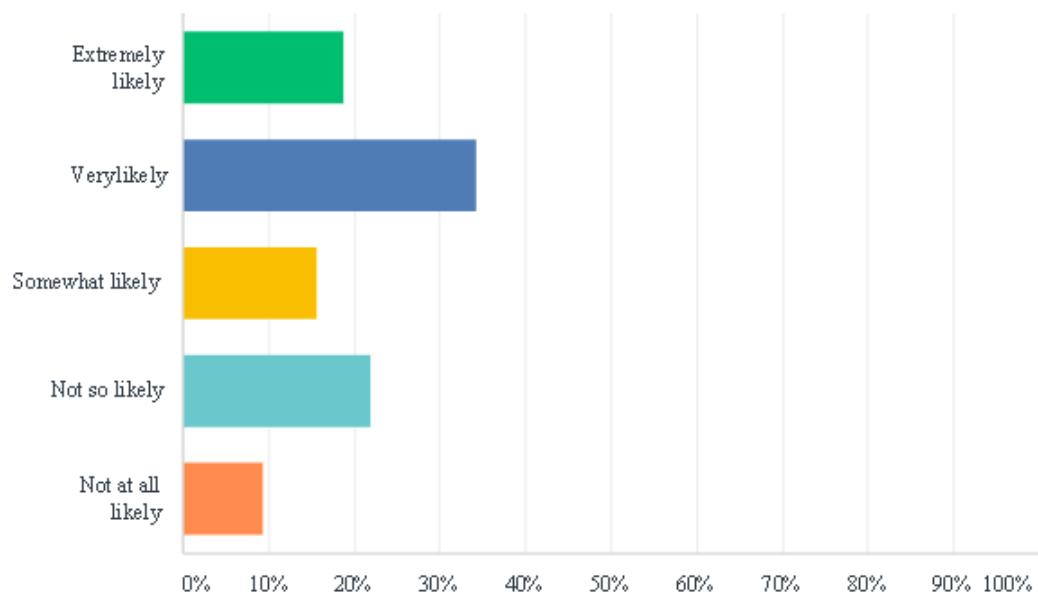
## ANSWER CHOICES

## RESPONSES

Financial independence	80.65%	25
Enjoying my life	19.35%	6
Other	0.00%	0
<b>TOTAL</b>		<b>31</b>

If still u didn't plan and you have been given a chance to meet a financial advisor how likely u will consider?

Answered: 32    Skipped: 0



## ANSWER CHOICES

## RESPONSES

Extremely likely	18.75%	6
Very likely	34.38%	11
Somewhat likely	15.63%	5
Not so likely	21.88%	7
Not at all likely	9.38%	3
<b>TOTAL</b>		<b>32</b>

How likely is it that you would recommend our new product to a friend or colleague?

Answered: 31 Skipped: 1



DETRACTORS  
(0-6)  
65%  
20

PASSIVES  
(7-8)  
13%  
4

PROMOTERS  
(9-10)  
23%  
7

NET PROMOTER®  
SCORE  
-42

In your own words, what are the things You consider before doing financial planning for retirement fund?

Answered: 26 Skipped: 6

## Implementation of 3D Printing in Health Care

Mithila Chavan<sup>1</sup>, Ashish Jaiswal<sup>2</sup> and Ashutosh Kolambkar<sup>3</sup>

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### ABSTRACT

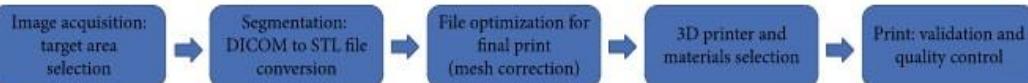
*Three-dimensional (3D) printing alludes to several fabricating innovations that create a physical show from computerized data. Therapeutic 3D printing was once a yearning pipe dream. In any case, time and venture made it genuine. These days, the 3D printing innovation speaks to a huge opportunity to assist pharmaceutical and restorative companies to make more particular drugs, empowering a quick generation of restorative inserts, and changing the way that specialists arrange methods. Patient-specific 3D-printed anatomical models are getting to be progressively valuable apparatuses in today's practice of exactness pharmaceutical and for personalized medicines. Within the future, 3D-printed implantable organs will likely be accessible, lessening the holding up records and expanding the number of lives spared. Added substance fabricating for healthcare is still exceptionally much a work in advance, but it is as of now connected in numerous distinctive ways in the restorative field that, as of now reeling beneath colossal weight with respects to ideal execution and decreased costs, will stand to pick up exceptional benefits from this good-as-gold innovation. The objective of this examination is to illustrate by a profound investigation of the 3D-printing applications in the restorative field the value and how effective innovation it is.*

### INTRODUCTION

Among the diverse fabricating forms that are now embraced by the industry, 3D printing is an added substance method. It could be a handle through which a three-dimensional strong question, for all intents and purposes of any shape, is produced beginning from a computerized show. Therapeutic 3D printing was once a driven pipe dream. Be that as it may, time and venture made it genuine. These days, 3D printing innovation speaks to an enormous opportunity to assist pharmaceutical and therapeutic companies to make more particular drugs, empowering a fast generation of therapeutic inserts and changing the way that doctors and specialists arrange strategies. This innovation has different applications, and the quickest developing development within the therapeutic field has been spoken to by the appearance of the 3D printing itself. Five specialized steps are required to finalize a printed show. They incorporate selecting the anatomical target range, the advancement of the 3D geometry through the handling of the therapeutic pictures coming from a CT/MRI filter, the optimization of the record for the physical printing, and the suitable choice of the 3D printer and materials (Figure1). This record speaks to the direction for the ensuing printing, "slicing" that advanced plan shows into cross segments. That "sliced" plan is at that point sent to a 3D printer, which fabricates the question by beginning at the base layer and building an arrangement of layers on best until the question is built utilizing the crude materials that are required for its composition. A patient-specific show with anatomical devotion made from imaging dataset is at last gotten. In this way, the 3D printing has the potential to altogether make strides the inquire about information and the aptitudes of the modern era of specialists, the relationship between understanding and specialist, expanding the level of understanding of the malady included, and the patient-specific plan of implantable gadgets and surgical apparatuses and optimize the surgical prepare and fetched. These days, diverse printing methods and fabric are accessible in

**Figure 1**

3D-printing workflow.



arrange to way better replicate the quiet life structures. Most of the accessible printing materials are unbending and thus not ideal for adaptability and versatility, not at all like organic tissue. Subsequently, there are these days materials able to shut the hole between the genuine life structures and the replicated one, particularly considering the delicate tissue.

## 1. PROBLEM DEFINITION

Injuries and absconds that require tissue or organ transplantation stay pressing issues in clinical medication, and issues still exist for the utilize of current approaches, which incorporate auto-transplantation xeno-transplantation, and the implantation of fake mechanical organs. Although auto-transplantation can abdicate a palatable impact, the positive result is at the fetched of an antilogous wellbeing organization and may lead to numerous complications and auxiliary wounds. Potential dangers are moreover related to xeno-transplantation, such as immunological dismissal and viral transmission; besides, source benefactors are constrained. In any case, the implantation of counterfeit organs in clinical medicines is regularly effective and makes strides the quality of life of patients. Three-dimensional (3D) printing innovation is anticipated to unravel the impediments that are experienced when utilizing conventional strategies by joining the personalized development of human bionic tissue or organs.

## 2. ADDITIVE MANUFACTURING /ADDITIVE PROCESS

To get it what is 3D printing and how is it distinctive from conventional printing, one should get it two concepts, two-dimensional printing by desktop printers and carving or figures. 3D printing is most commonly done by printheads (ink) comparable to the office or domestic desktop printers, and consequently, the innovation picked up the well-known title of 3D printing. The distinction is that, rather than ink, the printheads apportion different materials such as plastics, metals, and wood powder. It is more fitting to compare it with carving or figures. Ordinarily, the design is made by the craftsman with a visual picture in intellect and carving or chiseling the stone gradually diminishing the total stone into the conclusion item.

The chiseled stone is for the most part squandered; the celebrated case is the development of the Taj Mahal. This sort of carving whether in stone, wood, etc., is called subtractive preparation since the initial beginning fabric is subtracted to create the conclusion item. The 3D printing works precisely the opposite. The conclusion item (say Taj Mahal demonstrates) is built by the testimony of the fabric (e.g., Plastic) layer by layer on a platform by the printhead. The ultimate item (a plastic Taj Mahal) is composed without squandering any fabric, and consequently, usually called added substance printing (including layer by layer).

The beginning diagram is within the shape of a computer record (commonly created by a computer app-computer-aided plan [CAD]) which is encouraged into the computer joined to the 3D printer. From that point, the printing goes on without any extra inputs required and may take a few hours to print depending on the estimate of the conclusion item.

## 3. COMMON TYPES OF 3D PRINTERS

All 3D printing forms offer points of interest and disadvantages. The three most commonly utilized 3D printer innovations in therapeutic applications are particular laser sintering (SLS), warm inkjet (TIJ) printing, and combined testimony modeling (FDM).

### SELECTIVE LASER SINTERING

An SLS printer employments powdered fabric as the substrate for printing unused objects. A laser draws the shape of the protest within the powder, melding it together. At that point, a modern layer of powder is laid down and the method repeats, building each layer, one by one, to create the object. Laser sintering can be utilized to make metal, plastic, and ceramic objects. The degree of detail is limited only by the accuracy of the laser and the fineness of the powder, so it is conceivable to make particularly nitty-gritty and sensitive structures with this sort of printer.

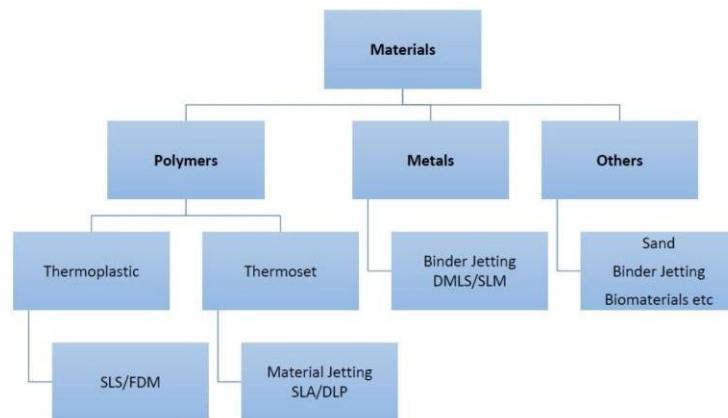
### Thermal Inkjet Printing

Inkjet printing could be a “noncontact” procedure that employments warm, electromagnetic, or piezoelectric innovation to store little beads of “ink” (real ink or other materials) onto a substrate agreeing to computerized instructions. In inkjet printing, bead testimony is ordinarily done by utilizing warm or mechanical compression to launch the ink drops. In TIJ printers, warming the printhead makes little discuss bubbles that collapse, making weight beats that launch ink drops from spouts in volumes as little as 10 to 150 picolitres. Bead estimate can be shifted by altering the connected temperature angle, beat recurrence, and ink viscosity.

## Fused Deposition Modelling

FDM printers are much more common and cheap than the SLS sort. An FDM printer employs a printhead comparable to an inkjet printer. In any case, rather than ink, dots of warmed plastic are released from the printhead because it moves, building the question in lean layers. This handle is rehashed over and over, permitting exact control of the sum and area of each store to shape each layer. Since the fabric is warmed because it is expelled, it wires or bonds to the layer's underneath. As each layer of plastic cools, it solidifies, steadily making the strong question as the layers construct. Depending on the complexity and taken a toll of an FDM printer, it may have upgraded highlights such as numerous printheads. FDM printers can utilize an assortment of plastics. 3D FDM printed parts are frequently made from the same thermoplastics that are utilized in conventional infusion molding or machining, so they have comparable solidness, strength, and mechanical properties

## 4. MATERIALS



The magnificence of the 3D printing is that a huge assortment of fabric having distinctive properties has been always included at a quick pace. This has made 3D printing an all-inclusive apparatus. It can print objects as straightforward, murky, rubber-like, plastic, metallic, wooden, glass, and with any color of ones' choice. The most recent propels are within the field of science where human and animal tissues are moreover utilized as a fabric for 3D printing. The choice of material depends on the ultimate properties alluring within the end product. If you wish biodegradable fabric, at that point polylactic corrosive (PLA) could be a great choice, and if you wish quality, adaptability, and solidness, at that point nylon and acrylonitrile butadiene styrene (ABS) is nice. The fabric utilized can be classified as:

## 5. BIOMATERIAL

There are special challenges to overcome when the manufactured fabric is to be embedded interior of the human body. The 3D structure ought to be congruous with other tissues and not inspire an immunological reaction. It must be able to operate for a long time submerged in body liquids. The estimate and thickness change from microns to millimeters to a few centimeters.

Even though the mechanical 3D printers can presently construct layers of microns thickness, such as 16–75  $\mu\text{m}$  determination for SLA, 80  $\mu\text{m}$  layer thickness for SLS, and 178  $\mu\text{m}$  layer thickness for FDM, the human tissues require an endless extent of sizes. The glomeruli of kidneys are ~approximately 200  $\mu\text{m}$  in breadth, the human liver lobule is almost 1.5 mm in breadth, and blood vessel systems extending from micrometer (capillary) to multi-centimeter (human aorta) may require numerous spouts from 100 to 1000  $\mu\text{m}$  estimate. The human tissues are categorized as large scale-, small scale-, and nano-architectures. The macro-architecture is the in general shape of the organ or tissue, such as liver or bones; the microarchitecture is the format of the tissue such as intercellular format, porosity, and shape; the nanoarchitecture is surface adjustment such as separation, multiplication, or cell grip at the atomic level.

The integration of RP (Rapid Prototyping), CAD, attractive reverberation imaging (MRI), and computed tomography (CT) has empowered the printing of large scale-architecture and microarchitecture. Strong freeform creation is the sort of RP that has encouraged the planning and manufacture of complex biomedical gadgets. The biomaterials commonly utilized are living practical cells on scaffoldings of polymers (engineered

and common), ceramics, and metals. These “bio-inks” contain living cells and are chemically or physically cross-linked with polymers to create hydrogels.

There are exceptionally few biodegradable and biocompatible biomaterials when utilizing SLA innovation. Different tars have been utilized for a single construct with PEG-DMA and PEG-DA with fluorescently labeled dextran and fluorescently labeled bioactive PEG inside diverse districts of the framework. More current macromers utilized are portions of PCL (three-armed hydroxyl-terminated), photo-curable poly (D, L-lactide), and PPF-DEF.DM innovation in bioprinting has commonly utilized biocompatible polymers such as PCL and bioactive glass composites, PLGA with collagen invasion, PCL coated with gelatin, PMMA, and PLA.

3D bioplotting and biofabrication are moderately more current procedures being utilized progressively. Bioplotting materials incorporate PLGA, TCP, collagen and chitosan, collagen-alginate-silica composites coated with HA, soy protein, and agarose with gelatin. These are utilized with human umbilical vein smooth muscle cells, human skin fibroblasts, rodent essential bladder smooth muscle cells in collagen beads, human microvascular endothelial cells in fibrin, and alginate beads. Moreover, there's bioprinting of single cells and cell-laden hydrogel-PCL frameworks [–]. Piece cell printing, a tall throughput printing of single-cell clusters, has been accomplished. The greatest headway will be to consolidate exactness infusion molding into 3D Printing.

## 6. ROLE OF 3D PRINTING IN MEDICAL FIELD

Even though 3D printing isn't as refined as specialists would like it to be, applications are as of now still accessible for 3D printing in healthcare. Agreeing to Kaur (2012), applications incorporate hearing helps, jaw substitutions, bones, crowns and bridges, appendage substitution, and tooth caps. Hearing helps can be 3D printed to the precise measure and shape of a person's ear canals in arrange to form a correct and personalized fit. This external shell that's made from a 3D printer can at that point have hearing help embedded into it, making a totally one of a kind arrangement to hearing shortfalls. Bones can moreover be reproduced to duplicate a person's unique bone. The jaw bone is such an illustration, as we are able presently to supplant a complete jaw bone with misleadingly made materials. Plastic polymers are the most components of these bones, which is diverse than the surgical titanium approach that has been the tried and genuine ordinary approach to bone substitutions. Prosthetics are moreover actually fit the person in arrange to form the correct fitment. These prosthetics are customized in an assortment of ways. For illustration, a prosthetic leg can be custom fit utilizing 3D printing from numerous angles. The leg can be balanced based on stature, a width of the leg being supplanted, and most critically, how the leg would be connected to a person's distal parcel of what is cleared out of their leg. Finally, dental practitioners can reproduce teeth that were once in an individual's mouth to correct details. With these current applications of 3D printing in healthcare, the long run looks bright.

### Prosthesis development

AM is additionally being utilized within the make of low-cost prosthetics. The collaborative nature of the AM industry has implied that a speedy web for 3D printed prosthetics uncovers a tremendous extent of peer-reviewed items that can be printed on desktop AM printers at an awfully moo fetched. These plans can effectively be scaled or changed to impeccably coordinate the measure of the client. The e-NABLE Community comprises of a bunch of individuals from all over the world who are utilizing their 3D printers to form free 3D printed hands and arms for those in require of an upper appendage assistive gadget. Concepts like this are presently getting to be more commonplace as AM proceeds to move into the standard.

### Tissue engineering

Therapeutic innovation is building minor organs utilizing the principals of 3D printing with stem cells as the generation fabric. Their little organs, once construct, will be in future be able to develop interior the body of a wiped out quiet and take over when a natural organ falls flat.

### Drug Development

The pharmaceutical industry stands on the brink of a transformation, calling for the acknowledgment and embracement of novel methods. 3D printing (3DP) is a figure to reshape how drugs are outlined, made, and utilized. Although a clear slant towards customized manufacture is seen, here we complement the merits and deficiencies of each innovation, giving experiences into angles such as the productivity of generation, worldwide supply, and coordination's. Modern openings for 3DP in medicate disclosure and pharmaceutical advancement and fabricating are divulged, advertising a forward-looking see on its potential employments as a digitized device for the customized apportioning of drugs.

## 7. LIMITATIONS

Some of limitations of AM when applied to the medical industry include:

Whereas time to print parts is regularly much speedier when compared to conventional fabricating strategies there's still critical time required for the transformation of check information to deliver a printable STL record. Since of this, for more pressing cases like injury surgery, nonexclusive inserts or therapeutic gadgets may be a more alluring arrangement.

Whereas the buy of a desktop FDM or SLA machine regularly ranges from \$1000 - \$5000, high-end AM printers (SLS, fabric flying and metal printing) extend from \$200,000 to \$850,000. Materials for these AM innovations are moreover as of now exceptionally costly. Right now, for these advances, the ideal arrangement is to induce items made out of the house.

A sound understanding of each AM innovation is basic and ought to be determined within the setting of the required yields. Each technology has qualities and shortcomings and the variety in cost to urge parts made can be noteworthy.

## 8. 3D PRINTING IN NEAR FUTURE

Within the close future, we'll see signs of progress counting the 3D printing of drugs (print-your-own medication) and tailor-made sensors to screen the conditions of your organs (think of an IoT gadget joined to your heart). "By 2021, 25% of specialists will hone on 3D-printed models of the understanding earlier to surgery," predicts Dwindle Basiliere, inquire about bad habit president at Gartner. "3DP will move from darkening back-office labs more into the cutting edge as a portion of a methodology to move forward surgical preparing and simulations." While non-living inserts (such as hip joints) are as of now accessible, the sacred chalice of medical 3D printing lies within the region of living organs such as kidneys, livers, and hearts. Progress in this field has the potential to upset the current framework of organ gifts and enormously move forward the wellbeing prospects of patients with coming up short organs. These inquiries are in its early stages of improvement, although one company has created 3D printed livers for sedate testing purposes since 2014.

## 9. CONCLUSION

Great advancement has been made within the field of medical-oriented 3D printing innovation, and the fabricating innovation of organ models and lasting inserts has ended up more develop. Analysts have effectively utilized different strategies to improve the mechanical behavior of personalized biodegradable frameworks.

Although 3D printing has already been realized in clinical applications, 3D printing innovation is still restricted in terms of materials and within the construction of ECM in vitro. Much work remains to be done sometime recently printed bioactive tissues and organs can be connected within the clinic.

All things considered; 3D printing currently offers numerous applications for healthcare. With it being in its earliest stages but still offering many applications right now. One day within the near future individuals will be walking around with organs interior them that were printed with a computer utilizing their cells, rather than transplanting organs from donors most likely after their lives.

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