3.
An Empirical Study on Knowledge, Perception and Appropriate Monitoring of Youth Towards Generic Drugs

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ABSTRACT

Generic drug industry continues to strengthen as a key pillar of India's economy. Although the market continues to diversify with new Pharmaceutical products like bio similar springing up from within India as well as internationally to sustain this. Thus, a study related to Generic drugs becomes more significant. Positive aspects regarding perception, knowledge and appropriate monitoring of generic drugs is essential in growing support for generic drug substitution exercise. Results of this can be implemented to evolve operative marketing strategies in the direction of youth to encourage the use of Generic drugs.

Keywords: Generic Drugs, Familiarity, Knowledge, Perception, Youth

INTRODUCTION

World-wide essential component of healthcare system is Pharmaceutical Industry, inclusive of social and privatized Institution that finds, evolve, produce, and merchandise drugs for the health of humans and animals. For the prevention and cure of diseases and disorders, pharmaceutical industries depend preliminary on R&D of Medicines. Pharmacological material manifests toxic properties and pharmacological activity. To improve Therapeutic activity and to reduce side effects, scientific and technological advancements are developing innovative pharmaceutical products. Pharmaceutical industry has a huge contribution for new treatments for non-chronic disease by developing wide range of drugs and Pharmacological treatments with the help of different channels and generic developers.

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The global pharmaceutical market has seen the emergence of new trends that are currently shaping the way participants generate value, evaluate investments, formulate strategies, build relationships, realign their branded drug portfolios and compete in an ecosystem. The United States has a significant role in Pharmaceutical innovation. Mainly US originates the new substances in the market. In Pharmaceutical industry the invention of new drugs becomes vital due to the constant loss of patent protection. Due to the expiration of patents the loss of income seems to happen often. Globally as the pressure is increasing, countries chasing various allowances from drug producer. To reduce pricing freedom and tangle of country- specific regulation, the successful global launch of a new pharmaceutical therapy is must. To create a business scenario where manufacturers can produce and launch globally to meet revenue and profit expectations, appropriate efforts for streamlining regulations and encouraging international trade are essential.

According to geology the price varies; the significance on examining health outcomes and aligned trade risks is pronounced in Western Europe, while in United States the analysis of account segmentation and managed care is essential. In order to create an always -increasing price restrictions of global market, price benchmarking, profit limitation, reduction in price and many other factors can be combined. In 2020, with the Indian pharmaceutical companies they have a participation of almost 85 percent and global, 15 percent. In the past 50 years, both in terms of meeting national needs and building a leadership position in the global pharmaceutical landscape, Indian companies have been successful. India already contributes more than 20% in value to the global generic market, and Indian products account for more than 40% (by volume) of US drugs. Low prices make drugs acceptable worldwide. With quality that is required by the USFDA, which has a reputation for providing the best quality standards, India will be able to provide quality medicines at low cost.

To increase production, the government must launch specific financial incentives to promote the manufacturing of diagnostic kits and other medical devices, especially since the raw material for the manufacturing of these devices is highly dependent on imports. It is also an opportunity to bring a much larger share of API manufacturing to India, so that the country is not dependent on critical input imports.

REVIEW OF LITERATURE

Undoubtedly, in medicine utilization branded drug is more influenced, but as Generic medicines do have bio equivalency to branded medicines, they are considered to be safe and cost-effective. Generic drug being extremely good in quality, secure and produced by highly regarded manufacturer. But the survey analysis indicates that customers' buying behaviour regarding generic drug was influenced by drug performance (Shafie and Ibrahim, 2009). Even though Generic drugs have many advantages but at the same time they do have some resistance factors, which are mentioned in terms of their use, like pharmacists have limited availability of these drugs, healthcare professionals have insufficient knowledge, no proper usage

guidelines and negative perception among consumers regarding their use (Claudio Andre and Jéssica Nathalia, 2014).

An institute located at Brazil found that instead of lower price and proof regarding bio equivalency, acceptability and substitution by generic medicines was still a question. According to William Shank's workonly one third of the people preferred generic drug, despite having positive attitude towards it. And quality matters for fifty percent of the physicians from the survey (Nardi and Ferraz, 2015). The general notion and doubt regarding difference in quality of generic versus branded version of medicines as evidenced by our perspective evaluation of physician and patients is appropriate in the present scenario. Improved quality of generic medicines has to be ensured prior to marketing in India (George and Mullavelil, 2020). In Nigeria, the agencies responsible for registration of drugs can enhance the utilization of generic drug, as the concern towards the National Agency for Food, Drug Administration and control increases (Auta and Bala, 2013).

An observational study mentioned significantly lower cost of generic drug, as the Drug Attitude Inventory-10 estimated the adherence towards medication. By observation between generic and branded drug users, there were no differences in adverse effect. Most patients were adherent generic and branded drugs (Pal and Roy, 2008). Pharmacists had conducted many interventions and new services have been developed and implemented, such as review of medication, management of medication, patient counseling. This were constructed to fit into daily practice, but still adherence of medication remains unsolved issue, even with the clinical trials (Anna and Isabella, 2018). A study of consultation services of Pharmacist in California for patient satisfaction found out that medication adherence was found in satisfied patients (Ning yan and Yunwei, 2008).

Japan does not have much use of generic drugs as they are in the West. Survey conducted among outpatient and medical staff showed higher respondents were aware about generic drugs and the reason behind this is that due to newspapers and television advertisements, awareness about generic drugs is increasing. This also found out that generic drug awareness was differed widely among age groups, as younger respondents were much more aware of generic drugs than older respondents. (Hoshi and Kimura, 2008). To increase the use of this kind of medicines, campaigns related to education for healthcare professionals and consumers is the best strategy to be implemented, more importantly it is essential to spread accurate awareness regarding quality. Among all the medicines available in the market and to make sure the supply of generic medicines, this needs to be linked with policies (Guttier and Silveira, 2017).

When the customer tends to purchase product, for the brand choice 'Inertia' is a type of determination. As this contains behavioral factor, its elimination relies on the individual's choice (Hara and Kobayashi, 2019). There was a shift observed according to one research study in the perception of certified physicians and some

specialist regarding the quality and safety of generic drug. But the doubt regarding this is still constant, especially in physicians to whom the information regarding availability was reported by pharmaceutical sales representative. (Kesselheim and Gagne, 2016). Also, when patients become more anxious, they refuse to switch towards generic drug if they are prescribed branded medicines, even if the Generic drugs are cheaper than the branded drugs (Barton and Burke, 2020).

For the countries like Spain, it needs extra efforts for Generic information. The generic drug's application and acceptance increases by activities like educational, safety and generic drug's efficacy. All kinds of health professionals can take an initiative for such educational development (Gimeno and Gómez, 2016). A survey of practitioners at a rural set up concluded in the favour of Generic substitution. Yet, the concerns regarding quality prevented them from prescribing generic drug. This is the only factor that restricts them from doing the same (Patil and Jaykare, 2016).

The details regarding knowledge, opinion and attitude regarding generic drugs was analyzed in Saudi Arabia concluding that the senior physicians of government hospitals were prescribing generic drug in smaller number of times resulting in less market share of local generic drugs. And this was only due to no sufficient knowledge regarding generic drug in the physicians (Salhia and Metwally, 2015). In Tamilnadu, a misconception towards generic drug was found out when the study to analyse the problems associated with generic drugs was analysed among the retailers and pharmacist (Basak and Satyanarayana, 2012).

OBJECTIVES

1. To know the awareness of people towards Generic drugs.
2. To study people's perception towards Generic drugs.
3. To study people's knowledge towards Generic drugs.
4. To study people's satisfaction towards Generic drugs.

RESEARCH METHOD

The research is explorative as well as conclusive in nature. It intends to understand Perception and Knowledge of Generic drugs amongst youth. To address the objective of the current study, two-step methodology was used. For the proper understanding of the research study exploratory research was used. And to collect data for testing hypothesis and validation of model, conclusive research was used.

The Sample

A sample of 203 respondents was chosen by using Non-probability convenience sampling technique across Gujarat State. The published material, such as books, magazines, journals, research papers, newspapers, and reports were used to collect the information. Online databases (computerized full text databases such as Proquest, Emerald, Google Scholar and various websites) were used to collect secondary data.

Primary data for the research study was collected through a structured questionnaire. Researcher has taken age group of 18-35 considering as youth as sampling unit.

The scope of the study is bounded to Gujarat, focusing on knowledge, perception and appropriate monitoring of youth towards generic drugs. The socio-demographic variables such as age, gender, marital status, education and occupation have been included in this study.

The Tools for Data Analysis

The Statistical Package for Social Sciences (SPSS) was used for analysis of the data. The descriptive statistics like screening, coding, decoding, tabulation and bar charts were used, besides inferential statistics like Cronbach's Alpha (to check reliability), Chi-Square test, One-way ANOVA, and Multiple Regression.

ANALYSIS AND DISCUSSION

Below Table highlights the socio-demographic features of respondents which were considered important for the assessment of knowledge, perception and appropriate monitoring towards Generic drugs. There were 52.7% and 47.3% males and females respectively. Most of the respondents were of the age group of 18-23 (53.7%). Whereas (62.6%) respondents were graduates and (51.2%) were students. And majority of respondents were unmarried (72.9%).

Factors	Particulars	Frequency	Percent	Cumulative Percent
Gender	Male	107	52.7	52.7
	Female	96	47.3	100.0
	Total	**203**	**100.0**	
Age	18-23	109	53.7	53.7
	24-29	69	34.0	87.7
	30-35	25	12.3	100.0
	Total	**203**	**100.0**	
Education	No-Formal Education	10	4.9	4.9
	Up to Higher Secondary	13	6.4	11.3
	Diploma	18	8.9	20.2
	Graduation	127	62.6	82.8
	Post-Graduation and above	35	17.2	100.0
	Total	**203**	**100.0**	
Occupation	Student	104	51.2	51.2
	Self employed	27	13.3	64.5
	Salaried	44	21.7	86.2
	Business man	22	10.8	97.0
	Housewife	6	3.0	100.0
	Total	**203**	**100.0**	
Marital Status	Married	55	27.1	27.1
	Unmarried	148	72.9	100.0
	Total	**203**	**100.0**	

Reliability (Cronbach's Alpha Analysis)

Reliability in statistics and psychometrics is in general consistency of a measure. A measure is said to have a more reliability if it produces similar results under constant conditions. Reliability was measured through Cronbach's alpha. Nunnally (1978) believed that an alpha greater than 0.70 is a good indicator of internal consistency. All the construct alpha values were found higher than the standard values. The alpha values were found to lie in the range of 0.779 to 0.959. Thus, all the variables had the alpha values greater than 0.7 indicating very high reliability of the variables.

Variables	Knowledge	Perception
Reliability	0.821	0.983

Mean Test

The Compare Means procedure is useful to summarize and compare differences in descriptive statistics across one or more factors, or categorical variables.

	Mean	**N**	**Standard Deviation**
Familiarity-Generic Drug	1.0394	203	0.19505
Buying Generic Over Branded	1.1823	203	.038702
Asked Physicians for Prescription	1.6453	203	0.47960
Asked Pharmacist for Generic Drug	1.3990	203	0.49091
Pharmacist had Influenced	1.4975	203	0.50123
Knowledge- Active Ingredients	1.5764	203	0.94807
Knowledge- Inactive Ingredients	1.8571	203	1.19167
Knowledge- Quality Standards	2.0049	203	1.31818
Knowledge- Bio Equivalent	1.9901	203	1.24276
Knowledge- No side Effects	3.4187	203	1.26532
Perception- Cheaper price	1.7438	203	1.21190
Perception- Effectiveness	1.9360	203	1.26680
Perception- Non chronic Disease	2.0640	203	1.32038
Perception- Mental Satisfaction	2.1133	203	1.27891
Perception- Easily Available	1.9852	203	1.23672
Perception- Product Details	2.0148	203	1.24470
Perception- Reduce Pharmaceuticals Expense	1.9163	203	1.26565
Perception- Substitution	1.9951	203	1.26059
Perception- Visual Identification	2.0690	203	1.23688
Perception- Pharmacists are knowledgeable	1.9458	203	1.25549
Perception- Characteristic While purchasing	1.8916	203	1.21789
Perception- Reasonable benefits	1.9655	203	1.29117
Perception- First priority as Generics	1.9901	203	1.30114
Satisfaction	1.8030	203	1.14779

The mean test conducted for Knowledge, Perception, monitoring and satisfaction has resulted in overall positively.

Hypothesis Testing- Chi Square Test

Chi-Square between Education and Knowledge regarding Bio-equivalency.

H_0- There is no association between Education and knowledge regarding Bio-equivalency

H_1- There is association between Education and knowledge regarding Bio-equivalency

Chi-Square Tests			
	Value	df	Sig. (2-sided)
Pearson Chi-Square	66.406[a]	16	.000
Likelihood Ratio	57.905	16	.000
Linear-by-Linear Association	30.761	1	.000
N of Valid Cases	203		

Here, Chi-Square test conducted between Education and knowledge regarding Bio-equivalency shows that p-value [0.000] is less than significance level which indicates that there is sufficient evidence to conclude that the observed distribution is not the same as the expected distribution. So, Null Hypothesis [H_0] is rejected. Thus, there is association between Education and knowledge regarding Bio-equivalency.

Chi-Square test between Education and Individuals' perception regarding cheaper price of Generic drug.

H_0- There is no association between Education and Individual's Perception regarding cheaper price of Generic drug.

H_1- There is association between Education and Individuals' Perception regarding cheaper price of Generic drug.

Chi-Square Tests			
	Value	df	Sig. (2-sided)
Pearson Chi-Square	79.630[a]	16	.000
Likelihood Ratio	65.333	16	.000
Linear-by-Linear Association	50.552	1	.000
N of Valid Cases	203		

Here, Chi-Square test conducted between Education and Individuals' Perception regarding cheaper price of Generic drugs shows that p-value [0.000] is less than the significance level which indicates that there is sufficient evidence to conclude that the observed distribution is not the same as the expected distribution. So, Null Hypothesis [H_0] is rejected. Thus, there is association between Education and Individuals' Perception regarding cheaper price of Generic drugs.

Hypothesis Testing – One Way ANOVA

H_0- There is no significant difference between Age group and Individual's Perception regarding Generic drugs.

H_1- There is significant difference between Age group and Individuals' Perception regarding generic drugs.

One Way ANOVA between Age group and Individuals' Perception regarding Generic drugs.

		Sum of Squares	df	Mean Square	F	Sig.
Cheaper price	Between Groups	15.668	2	7.834	5.576	0.004
	Within Groups	281.011	200	1.405		
	Total	296.680	202			
Effectiveness	Between Groups	10.826	2	5.413	3.455	0.033
	Within Groups	313.341	200	1.567		
	Total	324.167	202			
Non-Chronic Disease	Between Groups	14.037	2	7.018	4.151	0.017
	Within Groups	338.131	200	1.691		
	Total	352.167	202			
Mental satisfaction	Between Groups	20.993	2	10.497	6.785	0.001
	Within Groups	309.401	200	1.547		
	Total	330.394	202			
Easily available nearby	Between Groups	15.995	2	7.998	5.460	0.005
	Within Groups	292.960	200	1.465		
	Total	308.956	202			
Detailed product detail.	Between Groups	17.998	2	8.999	6.102	0.003
	Within Groups	294.958	200	1.475		
	Total	312.956	202			

P-values of the perception regarding generic drugs (Cheaper price, effectiveness, non-chronic disease, mental satisfaction, easy availability, detailed product detail) were found to fall between 0.001 and 0.033 which is less than 0.05. The null hypothesis is rejected at 5% level of significance. Thus, there is significant difference between Age group and Individuals' Perception regarding Generic drugs.

H_0- There is no significant difference between Education and Individuals' Knowledge regarding Generic drugs.

H_1- There is significant difference between Education and Individuals' Knowledge regarding Generic drugs.

One Way ANOVA between Education and Individuals' Knowledge regarding Generic drugs.

		Sum of Squares	df	Mean Square	F	Sig.
Active ingredient	Between Groups	41.518	4	10.379	14.674	0.000
	Within Groups	140.049	198	0.707		
	Total	181.567	202			
Inactive ingredients.	Between Groups	79.976	4	19.994	19.136	0.000
	Within Groups	206.881	198	1.045		
	Total	286.857	202			
Quality standards	Between Groups	66.072	4	16.518	11.479	0.000
	Within Groups	284.923	198	1.439		
	Total	350.995	202			
Bio-equivalency	Between Groups	74.195	4	18.549	15.445	0.000
	Within Groups	237.785	198	1.201		
	Total	311.980	202			

P-values of the Individuals' Knowledge regarding generic drugs (Active and Passive ingredients, quality standards Bio-equivalency) were found 0.000 which is less than 0.05; the null hypothesis is rejected at 5% level of significance. Thus, there is significant difference between Education and Individuals' Knowledge regarding generic drug.

Multiple Regression

Regression is a statistical measurement used in finance, investing and other disciplines that attempt to establish the strength of the bond among one dependent variable and a chain of other changing variables. In the Multiple Regression, Individuals' perception towards Generic drugs was inserted as independent variable and overall satisfaction towards generic drugs was inserted as dependent variable to know the impact of the individuals' perception on overall satisfaction of youth.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.915[a]	.838	.836	.46427
a. Predictors: (Constant), Generics provide reasonable benefits, I always prefer to look at drug characteristic while purchasing generic drug				

The model summary of Individuals' perception and overall satisfaction towards generic drugs showed the coefficient of determination (R2) of model as 0.838. Thus, Individuals' perception towards generic drugs explained 83.8 per cent of the variations in overall satisfaction.

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	223.009	2	111.504	517.310	.000[b]
	Residual	43.109	200	.216		
	Total	266.118	202			
a. Dependent Variable: Rate the level of satisfaction for generic drugs						
b. Predictors: (Constant), Generics provide reasonable benefits, I always prefer to look at drug characteristic while purchasing generic drug						

The ANOVA table is used to assess the overall significance of the regression model. F-value of 517.310 was found to have the p-value of 0.000. Model is significant as p-value is less than 0.05 at á = 0.05 level provides enough evidence for the significance of the model.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.135	.061		2.202	.029
	I always prefer to look at drug characteristic while purchasing generic drug	.409	.055	.434	7.436	.000
	Generics provide reasonable benefits	.455	.052	.512	8.784	.000
a. Dependent Variable: Rate the level of satisfaction for generic drugs						

The table of Coefficients shows that the Individuals' perception towards generic drug has positive impact on the overall satisfaction of the individuals. Impact of Individuals' preference to look at drug characteristics while purchasing generic drug and reasonable benefit provided by generic drugs was significant on the overall satisfaction as there were p- values of 0.000 and 0.000, which were statistically significant at 5% level of significance. Generic drugs providing reasonable benefits had higher effect on satisfaction with the standardized beta weight of 0.512, followed by the Individuals' preference to look at drug characteristics while purchasing generic drug with standardized beta weight of 0.434.

In the Multiple Regression, basic knowledge characteristic of Generic drugs was inserted as independent variable and overall satisfaction towards generic drug was inserted as dependent variable to know the impact of the Individuals' Knowledge on overall satisfaction of youth.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.908[a]	.825	.822	.48487
a. Predictors: (Constant), Generics are bio-equivalent to branded drugs, Generic drug differs only by inactive ingredients. (shape, colour, packaging), Generic drugs have same quality standards as its branded drugs., Generic drug have same active ingredient as the branded drug.				

The model summary of Individuals' Knowledge and overall satisfaction towards generic drug showed the coefficient of determination (R^2) of model as 0.825. Thus, Individuals' Knowledge towards generic drugs explained 82.5 per cent of the variations in Overall satisfaction.

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	219.568	4	54.892	233.481	.000[b]
	Residual	46.550	198	.235		
	Total	266.118	202			
a. Dependent Variable: Rate the level of satisfaction for generic drugs						
b. Predictors: (Constant), Generics are bio-equivalent to branded drugs, Generic drug differs only by inactive ingredients. (shape, colour, packaging), Generic drugs have same quality standards as the branded drugs., Generic drugs have same active ingredient as the branded drug.						

The ANOVA table is used to assess the overall significance of the regression model. F-value of 233.481 was found to have the p-value of 0.000. Model is significant as p-value is less than 0.05 at á = 0.05 level provides enough evidence for the significance of the model.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.020	.068		.300	.765
	Generic drug has same active ingredient as the branded drug.	.194	.070	.160	2.759	.006
	Generic drug differs only by inactive Ingredients. (shape, colour, packaging)	.234	.055	.243	4.258	.000
	Generic drugs have same quality standards as its branded drugs.	.263	.048	.302	5.515	.000
	Generics are bio-equivalent to branded drugs	.259	.059	.281	4.367	.000
a. Dependent Variable: Rate the level of satisfaction for generic drugs						

The table of Coefficients shows that the Individuals' Knowledge towards generic drugs has positive impact on the overall satisfaction of the individuals. Impact of Individuals' knowledge that Generic drugs having same active ingredients as branded drugs and differing only by inactive ingredients, generic drugs having same quality standards as branded drugs and generic drugs being bio-equivalent to branded drugs was significant on overall satisfaction as their p-values of 0.006, 0.000, 0.000, 0.000, were statistically significant at 5% level of significance. Generic drugs having same quality standards as branded drugs had higher effect on satisfaction with standardized beta weight of 0.302, followed by generic drugs being bio-equivalent to branded drugs (standardized beta weight = 0.281), Generic drugs differ only by inactive ingredients (standardized beta weight = 0.243), Generic drugs have same active ingredient as the branded drugs (standardized beta weight = 0.160).

MANAGERIAL IMPLICATIONS

This research study provides the useful implications to the marketers of Pharmaceutical industry, as this research study provides the insights of acceptance, preference and substitution about Generic drugs among Youth. It can be useful to the society as this research study has a survey of knowledge among youth, the marketers can spread the accurate knowledge regarding Generic drugs.

This study is beneficial to retail pharmacists as this research shows that people's preference for generic drugs over branded drugs has increased, so they can start providing generic drugs in their retail store to meet people's demand, as it can be cost effective for both pharmacists as well as customers. As increasing acceptance of generic drugs, people ask physicians to prescribe generics. So, this study is also beneficial to physicians as they get to know the acceptance and preference of people towards generic drugs. Results can be implemented to evolve operative marketing strategies in the direction of youth to encourage the use of Generic drugs.

CONCLUSION

This research concludes that with the increasing awareness people prefer generics over branded drugs as majority of respondents are familiar with generic drugs, it was observed that they ask their physicians to prescribe generic drugs as they highly accept the substitution of branded by generic drugs. In addition, people also ask pharmacists for generics so in a way pharmacist play important role in influencing people to buy Generic drugs. Approximately 70% of respondents have positively fulfilled the objective of the research study.

Talking about knowledge of the respondents, the major knowledge gap was identified that some people think generics do not have any side effects, while it's not true. People perceive this in an incorrect manner, though being familiar with the generics has indicated that they have basic knowledge about the generic drugs. This knowledge gap can be filled by creating awareness with more accuracy of information about the drugs.

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