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# Importance of Information and Communication Technology (ICT) in Healthcare Department – A literature Review

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**Abstract:-** As we simplify our lives in the age of the digital revolution, technology is also advancing and innovating. The geographical distance can practically be overcome by these technologies, which also provide better services at lower costs. Accessibility is a key concept in the healthcare sector, both in rural and some metropolitan regions. In order to improve healthcare for people and communities, ICT is essential. With the use of ICT, doctors, patients, hospitals, and laboratories may connect. Additionally, it enhances healthcare research analysis. Artificial intelligence can help to cut down on medical blunders. ICT is essential in the field of healthcare as well. Education can be used to the fullest extent not only by students but also by doctors, nurses, and other healthcare professionals. In this COVID-19 outbreak, telemedicine is crucial. It has the advantage of making it easier and quicker to reach medical patients who are in rural areas. The public can access it and use it from the convenience of their own homes. We can employ video conferencing in telemedicine so that a patient can speak with a doctor who may be thousands of miles distant. This medical invention therefore enhances remote patient monitoring.

**Keywords:-** Information Communication Technology, Telemedicine, Covid-19, Remote Monitoring.

## I. INTRODUCTION

In India today, healthcare is paradoxical. One the one hand, medical travel to India is very popular. Not just in India but throughout the world, it has the top hospitals and doctors. However, for many people who live in poverty or in rural locations far from major cities, access to primary and basic health care remains a pipe dream. It remains difficult to provide everyone with healthcare that is of equally high calibre. One that has formed a cube as a result of two events: a significant increase in the demand for medical care and the total number of people who lack the necessary resources. both in terms of the number of skilled physicians and the availability of handy, contemporary hospitals and medical facilities. In the early 2000s, Indian Health Care entered the Brave New World of ICT to practise telemedicine, just as India's Millennium Development Goals were proclaimed.

No matter how far away they were from doctors, patients could obtain quality healthcare through telemedicine. Satellite communication, made possible by the Indian Space Research Organisation, or ISRO, was one of the earliest methods of bridging this gap. Satellites inside were tasked with establishing connections between district hospitals and specialty hospitals and centres of excellence in large cities. No matter how far the place, satellite links now offered communication, and at the patient and special end, specific computer software and hardware were deployed.<sup>1</sup>

While the telemedicine satellite approach produced numerous new virtual OPDs. Over the course of the following 15 years, it didn't grow as widespread as anticipated. The price has been one of the major obstacles to it being a complete success. In India, telemedicine depended on satellites, and we depended on ISRO satellites. To interface with those satellites, we needed highly expensive tech equipment, and we needed an end-to-end link utilising the same technology.

Ironically, the price of installing satellite-based telemedicine systems has decreased. Other internet-based communication applications have become significantly cheaper. Many of us use these tools to chat with our friends and family. The first of its kind telemedicine is being practised at the trauma centre at Delhi's all India Institute of Medical Sciences, where some of the most serious emergency cases are admitted.

Using a simple laptop and free software like Skype that allows video calls without even being present in the ward around, the best doctors are available nearly 24\*7 at extremely low cost thanks to free calling applications. ICT has a significant role to play in providing effective patient care at a hospital like AIIMS, which sees an average of 3 million patients yearly. Because of this, AIIMS has become the first government hospital in India to entirely transition to digital technology through online registration and UHID production. On-call doctors, specialists, nurses, and labs can safely and anonymously access electronic medical records (EMR). a comprehensive hospital information system that transmits up-to-date information about each patient and the facility's resources in real time. MRI, X-ray, CT scan, and

other medical pictures can now be shared digitally thanks to India's first packages of image archiving and communication technologies. For the comfort of patients and their companions, India's first group of nursing informatics specialists has been assembled, along with a regularly updated public display system. The National Informatics Centre (NIC) has been working diligently behind the scenes to create a user-friendly system that anyone may utilise.<sup>2</sup>

E-hospital is a product made by NIC. It is operating and has over 50 hospitals. It refers to both the hospital's server and databases. Its services are available to customers

at the hospital counter. It implies that I must visit the hospital to access it as a regular person. JSS understood, just like AIIMS, that digitising patient information and important hospital procedures might significantly improve health care. So, with the aid of ICT specialists, they created a package or module known as Bahmani. In essence, it's an integrated hospital system, an EMR (Electronic Medical Records), and a combination of several open-source products that we have integrated together. We have also improved some of these products' usability to fit into a resource-constrained environment and people with her who have low literacy and who can use these things very easily.

Table 1 Each of these open-source programmes has been modified for use in rural areas.

BAHMNI	A bunch of 3 Different Open-Source Applications.
Open MRS	Store Medical Records Electronically
Open Elis	Manage Lab Processes and Validate & Store Lab Reports
Odoo	Manage Accounts Inventory & Administrative Operations

Bahmini doesn't depend on internet networks that can't access far-flung locations. Additionally, it makes advantage of easily accessible technology.<sup>1</sup>

## II. TELEHEALTH

In the previous two decades, telemedicine in India has advanced significantly, moving from expensive satellite-based systems to freely accessible social networking tools. Web-based healthcare applications offer the next level of ICT innovation since they offer a comprehensive range of services that are only available to the medical industry, rather than just video calls and texting. In short, the era of health informatics is now, and Mohali's Centre for Development of Advanced Computing (C-DAC) is where earth and gve come in. E-sanjeevani is just as simple to access online as any other social media platform. Online appointments and teleconsultations with doctors are available for patients. Electronic medical reports, or EMRs, can be created and shared by laboratories and doctors. Additionally, they are able to directly pick up readings and images from devices like MRIs, microscopes, film scanners, etc. The fact that E-sanjeevani enables remote patients to communicate with doctors is its greatest benefit. E-Sanjeevani is an entirely indigenous service that is aware of the unique requirements of Indian healthcare. Even those without much computer experience can use it because to its simple GUI (Graphical User Interface). This makes it ideal for use even across rural India and those centres where computer literacy is still developing.<sup>2</sup>

This makes it perfect for usage in rural areas of India as well as in places where computer literacy is still growing. There is a new focus on healthcare through mobile data, and this time it's not just about cure but also prevention. Patients nowadays may not all have computers, but they all have cell phones.

As a result of these factors, there is a mobile app called M-swasthya that focuses on health and wellness. It supports health monitoring and maintains individual data for body mass index, blood sugar levels, and other diabetes-related

metrics. In addition to connecting with the closest hospitals and emergency services, it serves as a conduit for communication between doctors and patients. You may also stay up to date on the most recent news in healthcare and fitness. Wellness is literally in the palm of one's hand. With today's technology, people can monitor and maintain their own personal health via ubiquitous computing or changeable sensors that work with wireless medical devices.

We might be able to close the distance between patients and doctors with the help of ICT. Virtual clinics are becoming more popular, yet no hospital or clinic is complete without diagnostic equipment. The development of inexpensive, portable, and user-friendly tools for diagnosing and tracking health parameters is a top priority for technologists.<sup>3</sup>

For instance, a standard mouse can be transformed into a wireless stethoscope that records lung and pulse activity and converts it into digital formats for online sharing. One may see a time when no one will be denied access to high-quality healthcare because to such simple and affordable technologies. The provision of high-quality healthcare is one of the main Millennium Development Goals for the public. It has an impact on people, particularly on those who are socially and economically poorer. The lack of trained physicians, specialists, and medical personnel, however, is one of the largest problems. For this slow but remarkable development, we are grateful for the tools of information and communication technology. The specialist team of AIIMS Delhi uses basic filming and broadcasting technology to advance a training session. Doctors and students from several medical institutes and hospitals participate in the session.<sup>4</sup>

People have developed many initiatives recently because there is bandwidth available. One of them is telemedicine, which has already been used by 200 hospitals and more than 160 medical schools. Now that the networking component has been taken care of, these projects can get going quickly because all they need to do is bring in their area of expertise and use it.<sup>1</sup>

National Knowledge Network is an extensive fibre-optic network with extremely high bandwidth that spans both India and other countries. The transfer of large amounts of data is accelerated and made more effective thanks to NKN's amazing speeds and data carrying capability of over 1 GB/sec. These facilities provide up a lot of new opportunities for medical innovation, collaboration, and education. As the virtual hospital develops and expands its networks, ICT is at the forefront of breaking down barriers in healthcare, from overcoming distances to inventing machines and creating information resources.<sup>1</sup>

Community participation is the active involvement of people from communities preparing for, or reacting to, disasters. True participation means the involvement of the people concerned in analysis, decision-making, planning, and programme implementation, as well as in all the activities, from search and rescue to reconstruction, that people affected by disasters undertake spontaneously without the involvement of external agencies. Health promotion was defined in the Ottawa Charter as “the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment.”<sup>5</sup>

### III. CONCLUSION

The nation already benefits from a solid information technology fibre network, domestic satellite communication technology, and skilled people resources. Telemedicine has the potential to help provide specialised healthcare to the most isolated areas of the nation with increased efforts. In addition to successfully operationalizing Continuing Medical Education (CME) programmes, telemedicine is projected to offer the benefits of tele-diagnosis, particularly in the fields of cardiology, pathology, dermatology, and radiology.

In telemedicine the use of electronic communication technologies to share patient data and deliver medical treatments in distant areas is known as telemedicine. Global telemedicine now encompasses much more than just health care services. These days, it is also widely used for data management, research, and education. However, it is paradoxical that telemedicine adoption is still in its infancy, especially in the public health sector, considering India's dominance in information technology.

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