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**REVIEW ARTICLE** **OPEN ACCESS**

# A Review on Improving Patients Life through Telemedicine in India

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**ABSTRACT**
*Telemedicine is the diagnosis and treatment of patients using telecommunications technology, thereby significantly improving the quality of healthcare in low-income areas. ECG transmission through telephone lines during the first half of the 20th century is the earliest published instance of telemedicine. In terms including both healthcare delivery & technology, telemedicine has advanced significantly since then. By facilitating their access to specialists and assisting them in close patient monitoring, telemedicine benefits family doctors as well. Different telemedicine services, such as store-and-forward, real-time and remote, or self-monitoring, offer a spectrum of educational, health administration and delivery disease screening, and emergency management services globally. Telemedicine, while not a panacea, can unquestionably contribute to a significant reduction in the strain on the healthcare system.*
***KEY WORDS:*** *Telemedicine, healthcare delivery, telecommunication.*

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## INTRODUCTION

Telemedicine is described as the remote diagnosis and management of diseases using telecommunications technology, thereby significantly improving the quality of healthcare in low-income areas. By facilitating their access to specialists and assisting them in close patient monitoring, telemedicine benefits family doctors as well. Different telemedicine services, such as store-and-forward, real-time and remote, or self-monitoring, offer a range of instructional, healthcare delivery and management, diagnostic tests, and worldwide emergency management services. [1]. The majority of Indians—roughly 70%—live in isolated, rural communities without access to even the most basic medical services. In these circumstances, telemedicine plays a significant role in delivering high-quality, reasonably priced healthcare to India's poorest citizens and is anticipated to decrease the rural-urban health gap [2].

Telemedicine is defined as "the delivery of health services, for which distance is a crucial factor, by all health care providers using information and communications technology for the exchange of factual info for prognosis, therapeutic interventions and preventing disease and injuries, monitoring and evaluation, and for the ongoing training of healthcare providers [3].

Telemedicine is "healing from a distance." It is frequently used as an all-encompassing phrase to refer to activities like educational, investigation, health assessments, and public primary prevention in addition to the provision of health care [4]. The extraordinary wide-spread use of telemedicine in response to the COVID-19 pandemic may have a profound and long-lasting effect on the provision of healthcare. In catastrophe situations, telemedicine has not frequently been tested .It enabled home needs for health care to be satisfied while decreasing contact for patients and healthcare providers, making it a crucial part of the emergency service to COVID-19 [5]. It also reduced demand on the already overburdened healthcare infrastructure. The need for telemedicine among patients has outpaced the capacity of healthcare professionals to meet it [6].

## HISTORICAL PERSPECTIVE

In 2001, the telemedicine pilot project was the first step in the establishment of telemedicine in India by the Indian Space Research Organization (ISRO). In 2005, the Health Ministry and MoHFW together founded the National Telemedicine Taskforce [7].

India had not widely adopted tele-medicine prior to the COVID-19 epidemic, and the early initiatives had not always been successful. Prior to the publication of a 25 March 2020 guidelines, telemedicine was not

explicitly legal either. The practice of telemedicine was hampered by several legal orders in India. The public questioned the utility of telemedicine after one appeals court in Maharashtra, one of largest states in India, upheld criminal negligence allegations in a case involving a phone consultation that culminated in the patient's death.[8].

On August 9th, 2020, telemedicine services were started in India. It was named as e-Sanjeevani, a component of "Digital India" plan. Medical professionals were able to give better health care throughout the continuing pandemic by using telecommunication techniques like video conferencing at various sites around the nation [9].

**IMPORTANCE OF INFRASTRUCTURE**

The success of telemedicine is significantly influenced by infrastructure. Even though India has advanced significantly in the last 20 years in the telecoms sector, the digital revolution has not yet had a positive impact on rural areas. According to TRAI, the government body in charge of regulating all forms of telecommunication, since about Sept 2019, there had been 687.62 million active internet users, or 52.08 subscribers for every 100 persons [10].

The success will depend upon infrastructure improvements, rural regions of the nation. A significant increase in infrastructure and capacity, best by the govt, can create a market that is appealing to commercial telecom providers, who will then make telemedicine services more widely available and of higher quality [11].

The WHO recommends a physician to patient ratio of 1:1000 [12], whereas India now only has a doctor to patient ratio of 0.62:1000 [13]. Since training new doctors takes time and money, the doctor-to-patient ratio is likely to stay low for a very long time. The current telemedicine services in different parts of the country help to offset this shortage in part.

**TRAINING PROFESSIONALS FOR TELEMEDICINE**

The effectiveness of telemedicine is dependent on the practitioners' skill levels in a variety of areas, a few of which differ from those required for a regular methods . Therefore, we support implementing novel teaching techniques for both practising physicians and medical students.The majority of doctors in India lack telemedicine-specific skills. For efficient remote assessment, interactions with group, handling of problems, sympathetic interaction and interpersonal skills, among other abilities, as well as good "web-side" manners, are required. To build up telemedicine services in India, telemedicine must be included in bachelor's degree and master degree medical education [14].

The Telemedicine Society of India has already made significant efforts to raise awareness of the benefits of telemedicine, to regularly update the content, and to fund conferences that provide training for both medical and non-medical personnel. It also publishes a newsletter on a regular basis that covers telemedicine advancements and applications in India [15].

**Application of Telemedicine in different areas:**

1. **Educational [16, 17]**

- Tele education: A flexible and interesting distant training programme that provides more practical instruction & updates on most recent advances for more accurate &effective treatment methods.
- Tele Conferencing: Doctors communicate and engage in a virtual room setting during workshops, conferences, seminars, or programmes for continuing medical education.
- Tele-Procutoring: Using advanced video conferencing technology, mentorship & assessment of surgical trainees are conducted remotely.

**2. Healthcare delivery [18]**

- Education Health Centers: Assists in the managing of long-term diseases like diabetes, obesity, and bronchial asthma. A nurse in school can use telemedicine to get advice from a specialist.
- Correctional Facilities: Provide for the medical requirements of the convicts without incurring the costs and risks of inmate movement or requiring a trained physician to enter.
- Cellphone health clinics: Offers quick and easy access to a distant doctor or other medical expert.
- Shipping and Transportation: During a medical emergency, shipping and transportation can help prevent evacuations and unplanned disruptions.

**3. Healthcare management [19]**

- Telehealth Care: It entails using ICTs to promote and prevent healthcare, and it is further separated into teleconference and telefollow up.
- Telehome Health Care: Using a Computer Telephone Integrated (CTI) system, monitor patients' vital signs around-the-clock from a central location.

- Services for diagnosis such as teleradiology & teleendoscopy.

**4. Diseases screening [20, 21]**

- Screening project for Diabetes by MDRF: The Chunampet Rural Diabetes Prevention Project.
- Screening of Ophthalmology by Aravind Hospitals at Andipatti village.

**5. Disaster management [22]**

An mobile telemedicine system with a satellite link &specialised telehealth software is appropriate in an emergency area where all other means of connectivity are down.

## ROLE OF TELEMEDICINE IN DIFFERENT AREAS

### ROLE IN FAMILY MEDICINE

Modern information & communication technologies have made it possible for telemedicine to deliver healthcare services both domestically and internationally, moving them outside hospitals and medical centers into people's homes [23]. With the aid of a CTI system that is set up for continuous vital signs monitoring, it enables remote patient monitoring [21].The CTI system enables family doctors to closely monitor patients who are chronically unwell and to receive live vitals alerts as necessary. Telemedicine also gives a family doctor remote access to a specialist's doctor's advice for cross consultation as necessary [24]. A excellent example would be visiting a nutritionist to create the optimum meal plan for an older patient who is bedridden and suffering from numerous co-morbidities, or seeing a cardiologist to validate a dubious ECG.

In contrast to telemedicine, telehealth entails using virtual technology to provide medical care outside of conventional medical facilities. An illustration would be advent of online health care, which enables elderly or chronically ill patients to get instructions for specific operations while still living at home [25]. There are four different types of tele-health services that include teleconferencing, store & forward, m health , and patient monitoring. Telemedicine has a lot of potential for helping family doctors, but it hasn't yet reached its maximum potential in this field. The primary barrier appears to be a lack of pertinent scientific literature demonstrating the applicability and economic viability of its application in family practise [26].

### ROLE IN PUBLIC HEALTH

One of the most important aspects of giving the poor access to high-quality healthcare is the technology used in telemedicine, which enables patients and physicians to be nearly anywhere. Location is no longer a barrier to providing treatment to rural locations because to the development of telemedicine.[27] With the launch of telemedicine devices with satellite connectivity, the program's initial challenge—the absence of a major centre for providing telemedicine technology in many outlying areas—was overcome.[28] Now, everyone can get telemedicine services regardless of the time, location, social level, or gender.

## CONCLUSION

While telemedicine cannot solve every issue, but it is very crucial in dealing with a wide range of issues. Tele health, tele education, and telehome healthcare are just a few of the services that are revolutionizing the healthcare industry. When all terrestrial communication channels are down, the use of satellite communications in emergency situations is highlighted. New technology is being held back by a lack of understanding and acceptability among the general public and professionals. Governments are already beginning to show a significant interest in the development of telemedicine procedures, leading to a gradual although gradual rise in its use in public health. Telemedicine procedures should realise their full potential in a few years.

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