



TELEMEDICINE IN INDIA: A BOON IN THE ERA OF COVID-19

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Abstract

Telemedicine has been used in Indian health care earlier, however the COVID-19 pandemic has provided the nation an enormous opportunity to increase its access and coverage with an added dimension. It gives health-care providers an opportunity to incorporate a telemedicine system to reduce doctor-patient physical contact and help in breaking the chain of transmission of infection and at the same time not neglecting the healthcare of patients. Various measures have been taken in India along with the guidelines provided by the Medical Council of India for the Registered Medical Practitioner (RMP). In this article, the literature pertinent to telemedicine with special reference to recently released practice guidelines were reviewed and summarised along with providing awareness about different types of telemedicine.

Keywords: *Telemedicine, COVID-19, E-health*

Introduction

Today, in the 21st Century though the technological and scientific domain advancements are magnificent, the present Covid-19 pandemic situation has proved us incompetent in various fields. The losses impact not only physical health but mental health, the economy, and the overall existence of humanity.

With India being the second-most populous country in the world with a population of 1.21 billion, the challenges are manifold. Firstly, the disparate ratio of doctors to patients increases the challenges. In addition to this, 69% of the total population lives in rural parts, so adequate and equitable distribution of health services has always been a matter of high concern. Telemedicine is an important tool that uses information and communication technologies to combat geographical barriers and improve health care services.

Overview of Telemedicine

In 1970, a term coined as telemedicine, which literally means “healing at a distance” came into existence. Based on various studies of peer review, the World Health Organization adopted the following description:

“The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid



information for diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities.”

Telemedicine claims its roots way back in the year 1959 when the first real-time video consultation by the doctors at the University of Nebraska used interactive telemedicine for neurological examination. Telemedicine also proved substantial in disaster management when NASA first used telemedicine services during the 1985 Mexico city earthquake in 1985 and the Soviet Armenian earthquake in 1988.

Substantial milestone in public health management using telemedicine was the establishment of a space centrenamed Medical Informatics and Technology Applications Consortium at Yale University in the year 1997 by NASA. The advancement in technology resulted in the transfer of images, sharing of medical files including X-rays and scans, audio and video consultation made telemedicine an effective tool.

Telemedicine can be classified into four types

1 On the basis of the timing of the information transmitted and people involved.

a. Real-time telemedicine or synchronous: In this method, the individuals involved need to be simultaneously present for the transmission of information which can be either in the form of telephone calls or video conferencing.

b. Store-and-forward telemedicine or asynchronous: In this method, the exchange of pre-recorded data between two or more people at different times takes place. It is an easier and simpler method as doctors can see the patient investigation sheets, USG or X-ray reports later at a convenient time.

2 On the basis of mode of communication-

a. Videos b. Audio c. Text-based

3 On the basis of the purpose of the consultation-

a. First time consult- the patient may consult with the doctor for diagnosis and treatment

b. Follow-up-Patient use the service for follow-up consultation on the ongoing treatment.

4. On the basis of the individuals involved-

A. Patient to Doctor. B. Caregiver to Doctor

C. Doctor to Doctor. D. Health Worker to Doctor

Application of telemedicine in the various sectors

1. Tele-education: Telemedicine has great prospects for medical education. The incorporation of telemedicine can provide positive and promising results in comparison to the traditional educational approach. With the help of telecommunication technologies, distance learning is possible which allow students to contact real patients and qualified specialists resulting in better knowledge and improved clinical skills. Also, it is flexible and interactive too.

2. Telehealthcare: One of the biggest challenges in rural healthcare is easy access to various health services. Telemedicine helps to solve these problems by providing medical services to the patient regardless of the location. The patient can be remotely examined about key vital signs and medical history; evaluated; diagnosed; and prescribed the drugs. It significantly reduces the need for unnecessary commuting to a place, saving time, money, and effort.



3. Disaster Management: Telemedicine can play a pivotal role in providing healthcare assistance to the victims of natural disasters such as earthquakes and tsunamis; and man-made disasters like wars and civil unrest among others. Telemedicine helps the victim to access medical services after any disaster. If communication links don't work during a disaster, satellite connectivity and customized telemedicine software work well during that time. Likewise, telemedicine also provides opportunities to remote contact patients who are in the quarantine phase. The patient's condition like temperature and oxygen level can be monitored through smart devices which are wearable. This feature really helped prevent the situation from getting worse during the COVID 19 pandemic worldwide.

4. Tele-home health care: Telemedicine technology can be applied to provide health care for prison inmates, elderly people, or homebound patients with chronic illnesses. To monitor patients for twenty-four hours, a Computer Telephone Integrated (CTI) system is used to provide substantial readings and give immediate warnings in case of emergencies. So, the patient is monitored remotely from a central station rather than traveling to remote areas for routine check-ups. Tele home care improves health care quality at reduced costs, and increased access to health care providers. It is less expensive, saves time, and efficient method.

Telemedicine in India

Telemedicine of India is growing steadily as Indian Space Research Organization (ISRO), Department of Information Technology (DIT), Ministry of External Affairs, Ministry of Health and Family Welfare, along with the state governments are substantial in its development.

Indian Space Research Organization is the pioneer of telemedicine in India with a Telemedicine Pilot Project in 2001, linking Chennai's Apollo Hospital with the Apollo Rural Hospital. Over the past few years, Indian Space Research Organization telemedicine network has expanded to connect 45 remote and rural hospitals and 15 super-specialty hospitals has been successful in covering the remote areas like the islands of Andaman and Nicobar and Lakshadweep, the hilly regions of Jammu and Kashmir, and some of the rural hospitals in other states also.

In past few years, the Ministry of Health in the Government of India has taken up several projects which has been substantial like Integrated Disease Surveillance Project and National Cancer Network, National Rural Telemedicine Network, National Medical College Network, etc. Few major milestones in making telemedicine become the future for tomorrow, standard telemedicine practice guidelines by the DIT in the Government of India, and the setting up of a National Telemedicine Task Force by the Health Ministry play a substantial role. For placing Indian telemedicine in the global scenario, various initiatives by the External Affairs Ministry are being nurtured like the Pan-African eNetwork project and the South Asian Association for Regional Co-operation Telemedicine Network Projects.

Few success stories of telemedicine in India include oncology at Regional Cancer Centre, Trivandrum; mammography services at Sri Ganga Ram Hospital, Delhi; and many more. Even during the Maha Kumbha Melas, the Government of Uttar Pradesh practices telemedicine through Mobile Telemedicine system vans equipped with videoconferencing systems enabling doctors in remote places to connect to any of the telemedicine-enabled medical hospitals for expert opinion. Even a few private sector organisations like Apollo Telemedicine Enterprises,



Asia Heart Foundation, Amrita Institute of Medical Sciences, and Aravind Eye Care along with the support of central and state governments are playing a pivotal role in making telemedicine a reality in India.

At present many gadgets like mobile phones, cameras, and wearable biosensors for clinical information are in use. Many useful telemedicine applications like Practo (<https://www.practo.com/health-app>), mfine (<https://www.mfine.co/>), and DocsApp (<https://www.docsapp.in/>), among others, are being tried to have a patient-specialist interface for smooth access and sharing of clinical information. Although, telemedicine has so much potential still it hasn't received an overwhelming response from the people because of various reasons including lack of awareness and acceptance of new technology among the main reasons.

Telemedicine in India during COVID -19 Pandemic

The entire world is at a standstill with the current situation of Coronavirus disease (COVID-19) and humanity is facing a novel viral pandemic. Despite all the advancements made by humans in various sectors, battling this deadly virus still seems challenging in many ways. However, the primary challenge is to contain the contamination from spreading along with adequate healthcare facilities being provided to the infected people.

Numerous nations, including India, have been following various measures like social distancing and wearing of masks to contain the spread of infection. Even the lockdown has helped to delay the spread of infection and given ample amount of time to deal with the current emergent situation. But, at the same time the lockdown also brought about an enormous loss of livelihood. So, though with the lockdown security can be taken care of, but it puts at risk the livelihood and security of millions of people of the country. Along with this, the population size and inadequate infrastructure also pose the biggest challenges to cope with the situation.

In this pandemic, fast progression in innovation will help in accomplishing the objective of providing accessible, cost-effective, and quality health service. And so, in the wake of the COVID-19 outbreak, telemedicine holds the answers to many of the problems. Technology should be the heart of the stimulus plan and telemedicine can act like a frontline weapon to deal with the current pandemic situation.

Telemedicine is the future of healthcare and its efficacy in the present situation is the proof of its impact. It is expected that by the year 2025, the telemedicine market in India is expected to reach \$5.4 billion. To strengthen the "Make in India" initiative in the health sector, we must use information technology-related tools. Along with it, the Ayushman Bharat Scheme launched by the Indian government is empowering telemedicine to a great extent for the advancement of the health sector in the country.

Telemedicine is definitely a promising tool providing benefits to health care professionals as well as patients.

- As telemedicine consultation is possible from any part of the world, it provides a tremendous opportunity for health care professionals to be connected to the patient regardless of where the patient is located. Thus, it is cost-effective, saves time, and provides prompt professional access to the patient in need.



- With the ongoing situation of COVID-19 and following social distancing norms, telemedicine proves to be an answer to various problems and situations. It is a safe and effective alternative to in-person care.
- Telemedicine can be effectively used for patients with various chronic diseases like hypertension, diabetes, and old-age complications that need to be constantly monitored with their medical conditions as they are more susceptible to COVID-19.
- Telemedicine can be used for providing useful information and making the patient as well as other family members aware of the contagious disease and its precautionary measures.
- Telemedicine can also provide psychological support during these times when patients are confined to their homes and coping with the disease can bring a lot of trauma to the patient as well as family members.
- With the current pandemic situation while being home quarantined, the patient can be monitored round the clock, thereby reducing the exposure of the patient, and at the same time hospital footfalls can be reduced to a great extent, and only the patients with critical conditions can be hospitalized. Especially in India with its over exploding population, one of the reasons for the situation not turning into a horrible state and out of control is the gift of telemedicine.

Realizing telemedicine's potential in healthcare delivery, the Board of Governors of Medical Council of India (MCI) on 25 March 2020 along with the partnership with NITI Aayog has adopted the "Telemedicine Practice Guidelines" which includes its principles and a practical framework of telemedicine.

The guidelines proposed by the Medical Council of India 2020

- a. Scope- These guidelines are designed to act as a tool to enhance healthcare services to a great extent. These guidelines are specifically designed for the Registered Medical Practitioner (RMP) under the Indian Medical Council Act (IMC) 1956. It provides the standards and norms for the RMP to consult patients through telemedicine, and information on all channels of communication with the patient like audio, video, or text messages.
- b. Guidelines having few exclusions :
 - No provision for consultation of the patient outside the jurisdiction of India
 - Any specification details for hardware and software, infrastructure building, and maintenance.
 - Usage of digital technology to perform any surgical procedure remotely
- c. Online course of the practice of telemedicine: In order to make the RMP familiar with the process along with the limitations of telemedicine practice-
 - An online program to be developed
 - All registered RMPs need to complete a mandatory online course within three years of its notification to provide consultation via telemedicine
 - Qualifying the course as prescribed will be essential prior to starting practicing telemedicine.
- d. Telemedicine application
 - Tools are the backbone of telemedicine and are used extensively in telemedicine for carrying outpatient consultation e.g. telephones, videos, internet, devices connected over LAN, WAN or mobile phones, chat platforms include WhatsApp, Facebook, etc. or Internet-based platform like skype, email or fax, etc.
 - Telemedicine application can be classified into four types- mode of communication, timing of the information, purpose of communication and interaction between the individuals



e. Seven elements necessary for any telemedicine consultation-

1. Context –

- The RMP should use their judgment to decide whether a telemedicine consultation or an in-person consultation is needed
- The RMP shall follow the same standard of care within the intrinsic limits of telemedicine like an in-person consultation.

2. Identification of RMP and Patient –

- Patient and the RMP should not be anonymous.
- The patient's details, registered ID, and the RMP credentials and contact details should be known to each other.
- The RMP in order to issue a prescription should know the age of the patient and can seek age proof.
- The RMP needs to disclose his name and qualifications before the beginning of the consultation.
- The RMP shall display State Medical Council registration numbers on prescriptions, websites, or other modes of communication.

3. Mode of Communication –

- In order to deliver proper care multiple options of technologies can be used to deliver telemedicine consultation.
- Primary modes of communication can be video, audio, or text.
- Based on the situation necessity, the RMP can use professional judgment to decide the best technology to use to diagnose and treat the patient.

4. Consent –

- For any telemedicine consultation patient consent is necessary.
- The consent is implied if the patient initiates the telemedicine consultation.
- If a health worker or a caregiver initiates a telemedicine consultation, explicit patient consent is necessary.
- Patient consent can be in the form of email, text, or audio and the RMP must record it in the patient record.

5. Type of Consultation –

- First consult-it means, the patient is consulting with the RMP for the first time, or more than six months have elapsed since the previous consultation or the patient has consulted for a different health condition earlier.
- Follow up-it means the patient is consulting with the same RMP for the same health condition. However, if the RMP doesn't recall the context of previous health treatment or some new symptoms which are not in the spectrum of the same health condition, then it will not be considered as a follow-up.

6. Patient Evaluation –The RMP before making any professional judgment should collect all the required medical information about the patient.

- The RMP should gather patient information in the form of investigation reports, history, examination findings, etc. to reach a proper judgment.
- The RMP can collect the information with the healthcare worker or provider by technology-based tools.



- If the RMP feels the information provide is inadequate, then he can request additional information from the patient.
- Depending upon the necessity, the RMP shall recommend video consultation or examination by another RMP or whether In-person consultation.
- The information required by one RMP may vary from another based on professional experiences and for different medical conditions
- The RMP shall keep a patient record in the form of case history, images, investigation reports, etc as appropriate.

7Patient Management

- Based on the RMP professional judgment, he can provide health education or provide counselling or can prescribe medicines
- The RMP can impart health education which could be related to diet, physical exercise, hygiene practices or contagious infections, etc.
- The RMP can counsel patients with specific advice related to food restrictions, do's and don'ts for a patient or physiotherapy, etc.
- The RMP may prescribe medicine via telemedicine only when RMP is satisfied with the amount of information gathered about the patient. It will be considered professional misconduct if the RMP prescribes medicine without an appropriate diagnosis.
- Few specific restrictions for prescribing medicines-

List O: Those medicines which are safe to be prescribed through any mode of teleconsultation like paracetamol, cough syrup, ORS solution, etc.

List A: those medicines which can be prescribed during the first consult which is a video consultation and are relatively safe medicine with low potential.

List B: those medicines which RMP prescribes during in-person consultation for the same medical condition, can be prescribed who are undergoing follow-up consultation.

Prohibited list: those medicines which have a high potential of abuse and could harm the patient or society at large or the medicines listed in Schedule X OF Drug and Cosmetic Act or any Narcotic and Psychotropic substance listed in the Narcotic Drugs and Psychotropic Substances, Act, 1985.

f. General Duties and responsibilities of an RMP-

- Protecting patient privacy and confidentiality as per IMC ACT and binding by the principles of medical ethics is required.
- All RMPs would be required to abide by IMC Regulations 2002 and with relevant provisions of the IT Act.
- All RMP should make sure to take utmost care for patient privacy and confidentiality.
- All actions of RMP which violate the patient care or privacy and confidentiality are not permissible, for example, misusing patient image and data, uploading an explicit picture of the patient on social media, etc.
- Penalties for the RMP are as per IMC Act, ethics, and other prevailing laws.

g. Documentation of consultation-

- Record of telemedicine interactions
- Patients reports, images, investigation reports, etc
- Prescription records to be maintained.

h. Telemedicine consultation fees-



- The treatment given to it is the same way as in-person consultation.
- Patient should be provided with the receipt for the charged consultation.

Barriers in telemedicine

- 1.Patient privacy and confidentiality-In comparison to face to face consultation, telemedicine faces a high risk in terms of privacy and security. No platform is completely safe from hackers, several laws should need to be well in place in order to build trust between the providers and patients in terms of privacy and confidentiality being maintained.
- 2.Data accuracy and misdiagnosis- the internet bandwidth affects the validity and reliability which can impact the health care practitioner making decisions and recommendations based on potentially inaccurate data.
- 3.Medical liability-simply applying existing principles of malpractice liability is not enough, special attention should be given to prevent errors, breaches of privacy, or technology failures.
- 4.Reimbursement- a proper process needs to be developed for the reimbursement provided by the health-care providers through telemedicine.
- 5.Technical requirements-for successful implementation of any telemedicine program require secure, high internet connection and software to be functional.
- 6.Training- in order to have a proper system of telemedicine to function, proper training to the support staff is required along with technical skills needed to set up and use equipment, professional knowledge, and professional development, etc.
7. Fear of change- resistance is seen amongst the health care providers as well as the patients. Patients mostly feel that face-to-face meetings and consulting the health care providers is more reliable. Even the health care providers doubt the quality of images and fear misdiagnosis.
- 8.Poor infrastructure and lack of facilities- despite various efforts to make telemedicine an effective way, the reality is that rural parts are still lacking in the basic facilities and proper infrastructure needed for the proper functioning of telemedicine.

Conclusion

Telemedicine seems essentially an effective and versatile product of the twenty-first century and has the potential to change the scenario of healthcare. It was anticipated that telemedicine will significantly change the healthcare service delivery from hospitals to homes. Though, due to various reasons telemedicine could not reach its true potential due to a lack of awareness and acceptance of new technology both by the public and by the professionals. Now, with the current pandemic situation telemedicine will continue to grow and be adopted by more healthcare practitioners and patients soon. Telemedicine applications are surely bringing the world closer, and distance no longer seems to be a barrier to the attainment of quality health care. Governments are taking a keen interest in developing telemedicine guidelines resulting in a slow and steady increase in its utilization in public health services.

Telemedicine cannot answer all problems and at the same time has its own limitations and barriers in terms of in-person consultation or emergency medical situations. Still, telemedicine has contributed to a great extent during the current pandemic of COVID-19 and with its wider acceptance and implementation due to its ease and availability will attain its true potential in the years to come.



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