Emerging Trends of Telemedicine in India: A Comprehensive Analysis

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Abstract:

Telemedicine, the practice of using technology to provide remote healthcare services, has gained significant traction in India over the past few years. With advancements in technology and the increasing penetration of internet connectivity, telemedicine has emerged as a viable solution to bridge the gaps in healthcare accessibility, especially in remote and underserved areas of India. This thesis aims to provide a comprehensive analysis of the trends of telemedicine in India, examining its current state, challenges, and future prospects. The research methodology includes a thorough review of existing literature on telemedicine in India, along with an in-depth analysis of relevant data, reports, and case studies.

First, there is a growing adoption of teleconsultation services, where patients can seek medical advice from qualified doctors remotely using video, audio, or text-based communication. This trend has been accelerated by the COVID-19 pandemic, which has prompted increased demand for remote healthcare services. Second, telemedicine is being used to improve access to specialized healthcare services, such as tele-radiology, tele-cardiology, and tele-psychiatry, in remote areas where such services are limited. Third, mobile-based telemedicine applications are gaining popularity, allowing patients to access healthcare services through smartphones, which are increasingly becoming ubiquitous in India. Fourth, there is a growing emphasis on telemedicine for chronic disease management, with remote monitoring and tele-rehabilitation services being utilized to manage conditions such as diabetes, hypertension, and respiratory diseases. However, the thesis also highlights several challenges facing the telemedicine landscape in India. These include issues related to the regulatory framework, data privacy and security, infrastructure limitations, lack of awareness and digital literacy among patients, and reimbursement and payment models. The thesis also discusses the ethical considerations of telemedicine, including the need for maintaining patient confidentiality, ensuring equitable access, and addressing issues of equity and justice. Based on the analysis of the current trends and challenges, the thesis presents recommendations for the future of telemedicine in India. These include the need for robust regulations and guidelines to ensure patient safety and data privacy, investments in digital infrastructure and connectivity in remote areas, promoting digital literacy among patients, fostering public-private partnerships, and developing sustainable reimbursement and payment models. The thesis concludes with a discussion on the potential of telemedicine to transform healthcare delivery in India and improve healthcare access for all.

Keywords: Telemedicine, Trends, India, Healthcare, Remote Healthcare Services, Adoption, Challenges, Regulations, Data Privacy, Infrastructure

1. Introduction:

According to the World Health Organization (WHO), "health is a state of complete physical, mental and social well-being and not just the absence of disease". The right to health was first conveyed in the World Health Organization constitution in 1946. It states that "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being".

Despite the fact that numerous treatments have been provided to people from ancient times, such as Ayurveda, Siddha, Unani, Yoga, Homeopathy, Naturopathy, and Allopathy, it has been discovered that the said healthcare system does not fully meet the needs of access to healthcare. As a result, there was a pressing need to explore different options in order to address the aforementioned challenges and protect and ensure access to healthcare.

There is a significant inequity in the distribution of healthcare services in a developing country like India, which has a population of over 135 crore people. Additionally, a sizable portion (* 68.84%) of the Indian population lives in rural areas with insufficient access to healthcare, while 75% of doctors are located in urban areas. In accordance with WHO recommendations, the appalling doctor-patient ratio in India—one doctor for every 1,000 patients—must be improved. According to the data, there is one specialist for every 1445 persons in India. In terms of the percentage of GDP spent on medical services, India ranks 184th out of 191 countries, according to the World Health Organization (WHO). Despite being one of the global healthcare markets with the greatest growth, India has been hesitant to accept technology-driven initiatives. A commitment to providing health services to all people, including in isolated and rural areas where services would be unattainable, results from the ethical human right to access clinical care.

Telemedicine, a concept that involves the use of technology to provide remote healthcare services, has been gaining momentum in India in recent years. With the advancement of technology and increased internet connectivity, telemedicine has emerged as a potential solution to overcome the barriers of healthcare accessibility in remote and underserved areas of the country. Telemedicine encompasses a wide range of services, including teleconsultation, tele-diagnosis, tele-monitoring, and tele-rehabilitation, among others, which can be delivered through various means such as video, audio, and text-based communication. In recent times, telemedicine has garnered increased attention, particularly during the COVID-19 pandemic, which has accelerated its adoption as a means to provide healthcare services while minimizing physical contact and reducing the burden on healthcare facilities. Telemedicine has been utilized to provide medical consultations, monitor chronic diseases, and deliver mental health services, among other healthcare needs, making it a vital tool in healthcare delivery. India, with its vast population and diverse healthcare landscape, presents unique opportunities and challenges for the adoption and implementation of telemedicine. The use of telemedicine has the potential to address issues such as geographical barriers, shortage of healthcare providers, and increasing demand for specialized healthcare services. However, there are also challenges related to regulations, data privacy, infrastructure limitations, digital literacy, and reimbursement models that need to be addressed for effective telemedicine implementation. This thesis aims to provide a comprehensive analysis of the emerging trends of telemedicine in India, examining its current state, challenges, and future prospects. The research will involve a thorough review of existing literature, analysis of relevant data and reports, and primary research through interviews and surveys of healthcare professionals, telemedicine providers, and patients to gather valuable insights. The findings of this analysis will shed light on the key trends and challenges of telemedicine in India and provide recommendations for its future growth and development. In conclusion, the emerging trends of telemedicine in India present immense potential to transform healthcare delivery and improve healthcare access for all. By addressing the challenges and leveraging the opportunities, telemedicine has the potential to bridge the gaps in healthcare accessibility and enhance healthcare outcomes in India. The subsequent chapters of this thesis will provide an in-depth analysis of the trends, challenges, and recommendations related to telemedicine in India, contributing to the existing literature in this field and providing valuable insights for policymakers, healthcare providers, and other stakeholders.

Telemedicine is the "natural evolution of healthcare in the digital world," according to the American Telemedicine Association (ATA).

Telemedicine is described by the World Health Organization (WHO) as "the delivery of healthcare services, where distance is a critical factor, by all healthcare 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 healthcare providers, all in the interests of advancing the health of individuals and their communities." The definition of "telemedicine" is "healing from a distance." It is frequently used as an all-encompassing term to refer to activities like education, research, health surveillance, and public health promotion in addition to providing medical care.

2. Historical Perspective of Telemedicine

2.1 From a Global Perspective

The first recorded instance of telemedicine occurred in 1879, when a doctor named George Edward Davis used the newly invented telephone to provide medical advice to patients in rural areas of Pennsylvania. Davis would use the telephone to communicate with patients and diagnose their conditions, and he would then provide treatment advice or refer them to a local physician.

However, it wasn't until the 20th century that telemedicine began to be used more widely. In 1924, a radio transmission was used to provide a medical consultation between a doctor and a patient on a ship off the coast of Newfoundland. This was followed in the 1950s and 1960s by the use of closed-circuit television systems to provide specialty consultations, such as radiology and cardiology, to patients in remote areas.

One of the earliest telemedicine programs was launched in 1959 by the Nebraska Psychiatric Institute, which used two-way television to provide consultations between psychiatrists in Omaha and patients in outlying areas of the state. This program was followed by the creation of telemedicine programs in other specialties, such as dermatology, oncology, and ophthalmology, in the 1960s and 1970s.

Since then, telemedicine has continued to evolve and expand, with advances in technology allowing for greater access and improved quality of care. Today, telemedicine is an increasingly popular and important tool for delivering healthcare services to patients in remote and underserved areas, as well as for improving access to care and reducing healthcare costs.

2.2 India's Telemedicine Development: A Synopsis

- 1996 saw the deployment of the first software for a hospital information system created domestically by CDAC Noida at SGPGIMS in Lucknow, Uttar Pradesh.
- 1999: DeitY, MCIT, Government of India, Indigenous Development of Telemedicine Technology & Pilot Deployments at AIIMS, New Delhi, PGIMER, & SGPGIMS Lucknow
- In 2000, ISRO deployed SATCOM-based telemedicine at Apollo Hospitals in Aragonda.
- In 2001, three institutions—AIIMS-New Delhi, PGI-Chandigarh, and SGPGI-Lucknow—established the first telemedicine network. First National Conference on Telemedicine held; Scientific Body for Promotion of Telemedicine in the Country, Telemedicine Society of India, formed
- 2001-2003: Major Medical Institutions (Govt. & Corporate) Started Telemedicine Activities
- 2003-2004: ISRO Deployed SATCOM-based TM Nodes Across the Country for Tele-Education and Tele-Consultation Services;
- 2005: MoHFW Established Indian Task Force for Telemedicine
- Budget for e-Health, including telemedicine, was approved by the Planning Commission in 2006 for the 11th Five Year Plan.
- The Government of Uttar Pradesh established the School of Telemedicine & Biomedical Informatics (STBI) at SGPGIMS, Lucknow. From 2007–2008 to 2012–2013, PHFI received a Grant-in-Aid to operate the MoHFW "Healthy India" Website for Health Education.
- 2007: The DeitY Government of India designated STBI at SGPGIMS, Lucknow, as the country's National Resource Centre for Telemedicine & Biomedical Informatics. Tele-ophthalmology Project was Supported by MoHFW, Government of India The MoHFW, Government of India supported the Onco-NET Project in numerous regions of the nation.
- 2009 saw MoHFW provide Rs. 25–50 lakh to National Rural TM Network to launch the Telemedicine trial programmes.
- 2010 saw the development of the National Medical College Network Project. SGPGIMS was designated as a National Resource Centre for Telemedicine by the MoHFW, Government of India.
- 2012 saw the development of EMR/EHR Standards by the MoHFW Expert Group, and 2013 saw the start of the process to build the NMCN on an open-tender basis. Through the National Optical Fibre Network's (2011) MCIT Initiative, high-speed bandwidth access will be made available to 2,50,000 Gramme Panchayats. Three

sites (PHC/CHC) have been connected to one medical college in the United States for telemedicine activities as part of a pilot project for teleconsultation.

Telemedicine procedures have become more and more common in India. The development of telemedicine services in India was greatly aided by the initiatives taken by ISRO, the Department of Information Technology (DIT), the Ministry of External Affairs, the Ministry of Health and Family Welfare, and the state governments.

In 2001, the Indian Space Research Organization (ISRO) launched a Telemedicine Pilot Project that connected the Apollo Hospital in Chennai with the Apollo Rural Hospital in the Andhra Pradesh village of Aragonda. The development of telemedicine services in India was greatly aided by initiatives taken by ISRO, the Department of Information Technology (DIT), the Ministry of External Affairs, the Ministry of Health and Family Welfare, and the state governments.

3. Rise of Telemedicine in India

3.1 Hospital- on-Wheels

4070 patients were seen as part of the DISHA (DIStance Healthcare Advancement) Project between July 1, 2005, and November 30, 2006, at a village in the Theni district, 90 kilometers from Madurai, a city in Tamil Nadu, South India. An x-ray machine, an ultrasound scanner, an echocardiogram, an ECG, a small biochemistry laboratory, a microbiological collection facility, an examining couch, and a toilet are all included in the air-conditioned Hospital-on-Wheels. Hematology, clinical pathology, biochemistry, histopathology, and microbiology were among the 142 laboratory tests performed. There were 248 X-rays, 138 ECGs, and 58 abdominal ultrasound tests performed. Preliminary research was done, awareness was raised, and the villages and an NGO worked out the logistics. Real-time teleconsultations were conducted using an ISRO-enabled VSAT and the van's video conferencing system. For the management of tertiary care, 63 patients were referred. The villagers who had access to specialized healthcare through this hospital-on-wheels expressed high levels of satisfaction. The hospital-on-wheels was a successful pilot initiative that benefited the tertiary care hospital, the rural population, and the healthcare delivery system as a whole. Long-term viability, however, would necessitate significant subsidies and the availability of health insurance. In order to establish connectivity from the mobile van, many issues were encountered.

3.2 Expansion of ATNF

In addition to the 7 facilities in Colombo, Dhaka, Lahore, Maldives, Lagos, Yemen, Sudan, and Kazakhstan, 92 centers have been established throughout India over the past 7 years. From the Andaman and Nicobar Islands to Mizoram in the north-eastern part of the country, India has centers. Referral centers include the Apollo tertiary care hospitals in Hyderabad, Delhi, Ahmedabad, Madurai, and Kolkata. A specialist can see many patients at once because to tele-camps.

3.3 Other applications of video conferencing

At the first Arab International Conference on Telemedicine in January 2001, the Apollo hospitals in Chennai's Telemedicine department was the only unit from Asia to attend. A study was subsequently delivered from Chennai at an international telemedicine conference in Upsala, Sweden, in June 2001. "Telemedicine as a tool for a more equitable distribution of health care delivery around the world" was the topic of this intercontinental live multipoint symposium between Europe, Africa, Asia, Australia, and the Americas. A low-cost method of showcasing the cutting-edge amenities accessible in India to a global audience is video conferencing. The Department of Neurosurgery and Fujitha Health University, Nagoya, Japan, held a two-hour teleconference in August 2001.

Without a hitch, this international grand round was conducted. In December 2001, there was a similar gathering after UDMNJ New Jersey. Since then, 108 videoconferences in various medical specialties have been held on a regional, national, and international level. The participants' talents are improved by these conferences. Our viewpoints shift, and we begin to consider the entire world. Additionally, each week features a surgical and a paediatric tele CME. Residents are scattered among several hospitals in India, whereas the faculty is located in Chennai.

3.4 ATNF's contribution to the expansion and advancement of telemedicine in India

As a telemedicine pioneer, ATNF has significantly contributed to the expansion and advancement of telemedicine in India. The ATNF has been chosen by the Government of India for the mega project to provide teleconsultation and tele education to the 53 countries of the African Union. It has been on the Standards Committee on Telemedicine (www.mit.gov.in/telemedicine/home), the National Task Force on Telemedicine, the Working Group on Telemedicine of the Planning Commission, and the Working Group of the SAARC committee on Telemedicine. Over 120 papers have been presented in regional, national, and worldwide conventions as part of the campaign to popularize telemedicine.

Additionally, about 40 papers have been released. Telemedicine is a fantastic CME tool for training non-specialists. The confidence of a rural physician is greatly improved by the notion that an expert is only a mouse click away. Telemedicine is transforming how healthcare is provided to the general public. People in rural India will no longer need to travel to nearby metropolises or state capitals to receive specialty care. Despite the fact that numerous pilot projects have been started, progress has been painfully slow because of a lack of capital infrastructure or, perhaps more importantly, because people lack dedication, involvement, and a desire to challenge the status quo.

The objective and hope is that telemedicine facilities will be available in most suburban and rural areas of India within the next several years. No Indian will eventually be denied access to an expert consultation regardless of where they are. Soon, consulting will only take a mouse click away! This is not unachievable. A critical mass must be obtained for this to occur. Instead of deploying better technology and obtaining funding, what is needed is a shift in the thinking of those concerned; awareness should permeate society as a whole. Only when society understands that distance is irrelevant in today's world and that telemedicine may close the access to healthcare gap between the "haves" and the "have-nots," will there be meaningful growth.

3.5 Mobile telemedicine in India

As part of the National Blindness Control Program, Shankar Nethralaya in Chennai, Meenakshi Eye Mission, Aravinda Eye Hospital in Madurai, and four other corporate eye hospitals have launched mobile tele-ophthalmology services with the assistance of ISRO. Mobile tele-hospitals have been introduced by SGRH, AIMS, SRMC, and AHF to improve access to specialized medical care in remote areas. The state government of Andhra Pradesh has introduced mobile clinics that will daily visit two villages to assess residents' health parameters and provide telemedicine using "104 services." In Maharashtra, BPL Mobile has introduced the value-added service to allow members fast access to high-quality medical help and real-time doctor engagement wherever they are. An e-medicine program for rural areas has been announced by the Gujarat government's health department.

3.6 Projects in Global Telemedicine India started

Under the auspices of the PanAfrican e-Network Project and the South Asian Association for Regional Cooperation (SAARC), the Ministry of External Affairs (MEA) has launched a worldwide telemedicine project in Africa and South Asia to expand its telemedicine-enabled healthcare and educational services.

3.7 Telemedicine SAARC Network

The 14th SAARC Summit, held in New Delhi in April 2007, gave the SAARC, which was formed as an expression of the region's collective decision to develop a regional cooperative framework, a significant push. The groundwork has been finished for a trial project that would link one or two hospitals in each SAARC nation with super-specialty hospitals in India, including AIIMS in New Delhi, SGPGIMS in Lucknow, PGIMER in Chandigarh, and CARE

Hospital in Hyderabad. Under the auspices of this project, which was launched in April 2009, the Jigme Dorji Wangchuck National Referral Hospital in Thimphu, Bhutan, has been connected to SGPGIMS in Lucknow and PGIMER in Chandigarh.

4. Regulations that Control Telemedicine

The following regulations regulate the practice of telemedicine in India.

4.1 National Medical Commission Act, 2019 ("NMC Act")

The NMC Act was declared the fundamental piece of law to govern medical education and the practice of medicine in India by the Ministry of Health and Family Welfare ("Health Ministry") in September 2020. According to the NMC Act, the only people who are permitted to practise medicine in India are those who hold a recognised medical degree and are registered with a state medical council. The NMC Act replaced the Indian Medical Council Act of 1956 ("IMC Act"), which governed the medical profession before September 2020. Transitional clauses in the NMC Act state that rules and regulations published under the IMC Act will continue to be in effect and be followed until new standards or requirements are laid down in the NMC Act.

In accordance with the applicable sections of the NMC Act, the rules and regulations are published. The Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002 ("MCI Code"), which establishes professional and ethical standards to be followed by doctors in their interactions with patients, pharmaceutical companies, and other members of the medical community, is one of the regulations created under the IMC Act. Until a distinct regulation on medical ethics is issued under the NMC Act, the MCI Code will be assumed to have been adopted under the NMC Act and will still be in effect.

4.2 Telemedicine Practice Guidelines ("TPG") Issued under the MCI Code

The Telemedicine Practice Guidelines were released in collaboration with the NITI Aayog by the Board of Governors, a body established by the Central Government to oversee medical education and the practice of medicine in India (replacing the Medical Council of India). All medical professionals who practice allopathic medicine must abide by these rules because they are now a part of the MCI Code. Until a new set of regulations on this topic is established under the NMC Act, the guidelines will continue to be valid and regarded as having been issued under the NMC Act. The Telemedicine Practice Guidelines include advice on the types of treatment that may be delivered and how to provide them, enabling medical professionals to practice telemedicine wherever in the nation.

4.3 Drugs and Cosmetics Act, 1940 ("D&C Act") and Drugs and Cosmetics Rules, 1945 ("D&C Rules")

In India, the production, marketing, import, and distribution of medicines are all governed by the D&C Act and D&C Rules. There is a distinct difference between a drug that can be sold by general retailers over-the-counter ("OTC") and one that must be sold under the supervision of a registered chemist upon presentation of a valid prescription (signed by a registered medical practitioner) in many foreign jurisdictions.

According to Indian legislation, OTC medications have a different definition. All medication sales must comply with the D&C Act's licensing requirement. There is a distinction between prescription and non-prescription medications, which is implied by the D&C Rules, which expressly state which drugs can only be sold on the provision of a prescription given by a registered doctor.

Schedules H, H1, and X of the D&C Rules contain a list of medications that may only be purchased with a prescription. According to the D&C Act, no one is allowed to sell any drugs without a permit from the licensing body. However, it allows for the sale of some pharmaceuticals by individuals without a license, specifically those listed in schedule K of the D&C Rules. Therefore, OTC pharmaceuticals in the Indian context would only refer to those medications listed on schedule K. These categories encompass, among others, household remedies, pharmaceuticals not meant for medical use, quinine and other antimalarial medications, magnesium sulphate, and compounds used to kill vermin or insects that spread disease to humans or animals.

According to the D&C Rules, prescription medications may only be administered upon presentation of a valid prescription that complies with the rules' requirements. A prescription must be in written, signed by the prescribing physician, and dated in accordance with the D&C Rules in order to be valid. The prescription must also include the quantity to be supplied, the patient's name and address, and the reason for the prescription.

4.4 The Information Technology Act, 2000 ("IT Act"), The Information Technology (Reasonable security practices and procedures and sensitive personal data or information) Rules, 2011 ("Data Protection Rules") and the Information Technology (Intermediaries Guidelines) Rules, 2011 ("Intermediary Guidelines")

Information is continuously exchanged between the patient and the service provider in telemedicine. Under the Data Protection Rules, the patient's personal information, including medical history and physiological circumstances, is referred to as Sensitive Personal Data or Information("SPDI"). A body corporate is required to comply with particular regulations under the Data Protection Rules when it collects, maintains, transfers, or processes this type of information. The Data Protection Rules generally state that the information should be acquired and processed in compliance with and on the basis of the consent given by the information source. Body corporates must implement sufficient security measures under the Data Protection Rules to guarantee that the data is stored securely.

The Personal Data Protection Bill, 2019 ("PDP Bill") will take over as India's main data protection and privacy framework in place of the Information Technology Act. The PDP Bill also takes permission into account as the foundation for data processing. In contrast to the IT Act, the PDP Bill takes a more thorough approach to data protection.

4.5 Government Policies Regulating Health Data

With the eventual goal of electronically preserving every Indian medical record, the Indian government is actively building a national health system. The National Health Policy, 2017, which included the construction of a National Digital Health Ecosystem ("NDHE") and the realization of universal healthcare as one of its goals, marked the beginning of the process. The Health Ministry and NITI Aayog, the think tank for the Indian government, have since produced a number of initiatives aimed at establishing the NDHE. These policies, which establish the fundamental framework and infrastructure for the NDHE, include the National Health Stack and the National Digital Health Blueprint Report.

The National Digital Health Mission ("NDHM"), a significant digital health programmer with the goal of giving each person in the nation a Health ID, was officially launched by the Indian government on August 15, 2020. In accordance with this, the Health Ministry recently made the Health Data Management Policy ("HDM Policy") under the NDHM available for public discussion. The HDM Policy details the rights and responsibilities of all parties involved in the collection and processing of digital health data, including patients, Health Care Providers, clinical settings, pharmaceutical companies, insurance providers, etc. It also addresses the data protection and privacy aspect of health data. NDHE is currently in the planning phases of being established or in other ways it can be said that it is in the developing phase. Once such a system is in place, HCPs offering teleconsultations would have the choice of rapidly and simply accessing their patients' electronic data. However, it should be emphasized that both HCPs and telemedicine platforms may be obliged to follow specific compliances to guarantee that they manage patient data in compliance with the guidelines established by the NDHE.

4.6 Other Service Providers Regulations under the New Telecom Policy 1999 ("OSP Regulations")

The Department of Telecommunications requires Application Services," which includes telemedicine services to be registered as "Other Service Providers" (OSPs) in the department. In general, the OSP registration imposes requirements on the registration holder as part of the license.

4.7 Telecom Commercial Communication Customer Preference Regulations, 2018 ("TCCP Regulations")

It might be necessary for telemedicine platforms to SMS users and patients. The TCCP Regulations forbid sending unsolicited commercial messages by phone or SMS. Only subscribers who have chosen to receive such communications can receive promotional messages after registering with an access provider. Sending voice calls or transactional SMS is not prohibited by law, nevertheless. As long as the recipient is a client of the sender, the message is sent within 30 minutes of the transaction taking place, and it is directly related to it, a transactional communication is one that is triggered by a transaction carried out by the message's recipient. For example, any information sent in connection with an OTP or the purchase of goods and services, for instance, would be considered a transactional message. Even though they are directly related to the delivery of goods, all other messages can only be delivered using a format that has been registered with the access provider with the recipient's permission.

5. Current scenario in India

Telemedicine has seen significant growth and adoption in India over the past few years, especially with the onset of the COVID-19 pandemic. The Indian government has recognized the importance of telemedicine and has taken steps to promote its adoption and usage.

In March 2020, the Ministry of Health and Family Welfare issued guidelines for telemedicine practice in India. These guidelines provide a framework for the practice of telemedicine and address issues related to patient privacy, data security, and informed consent.

Telemedicine services have been used extensively during the COVID-19 pandemic to provide medical consultations and support to patients in isolation or quarantine. Many private healthcare providers and startups have launched telemedicine platforms and apps to connect patients with doctors and healthcare professionals.

The Indian government has also launched several telemedicine initiatives to improve access to healthcare services in remote and underserved areas. The National Health Stack, a digital infrastructure for healthcare, includes a telemedicine platform that allows patients to connect with doctors and healthcare professionals across the country.

Telemedicine has the potential to revolutionize healthcare delivery in India, especially in rural and underserved areas where access to healthcare services is limited. However, there are still challenges that need to be addressed, such as the need for better connectivity and infrastructure, and the need to address issues related to data privacy and security.

In India, telemedicine has the potential to address several challenges in the healthcare sector, including the shortage of healthcare professionals, the high cost of healthcare services, and the lack of access to healthcare services in remote and underserved areas.

Telemedicine platforms and apps have made it easier for patients to consult with doctors and healthcare professionals from the comfort of their homes. This has reduced the need for patients to travel long distances and wait in long queues at hospitals and clinics, making healthcare more accessible and convenient.

However, there are still challenges that need to be addressed. One of the major challenges is the lack of awareness and trust in telemedicine among patients, especially in rural areas. Patients may be hesitant to use telemedicine services because of concerns about the quality of care, the security of their personal information, and the reliability of the technology.

Another challenge is the need for better connectivity and infrastructure, especially in rural areas. Many parts of India still lack basic internet connectivity and electricity, which can make it difficult to access telemedicine services.

Finally, there is a need to address issues related to data privacy and security. Patients may be hesitant to share their personal and medical information over telemedicine platforms and apps, especially if they are not confident that their data will be kept confidential and secure.

Despite these challenges, the adoption of telemedicine in India is expected to grow in the coming years, driven by the need to improve access to healthcare services and reduce healthcare costs. As the government and private sector

invest in better infrastructure and technology, and as patients become more comfortable with using telemedicine services, telemedicine has the potential to transform healthcare delivery in India.

5.1 Impact of COVID 19

The devastating coronavirus outbreak has sparked a global crisis that has paved the path for the usage of telemedicine or health technology. The continuous use of telemedicine, particularly in the provision of care for remote and symptomatic patients, is a strategy for controlling the spread of COVID-19. It also tries to ensure that everyday growth in the number of active people exposed to the virus is prevented. Leading medical professionals can effectively lower the probability of viral transmission by categorizing patients into "risk and risk factors"—especially for chronic patients.

The management of clinical trials, disease control, and epidemiological research can all be enhanced by the use of telemedicine during epidemic diseases like the COVID-19 outbreak. A 21st-century method of patient care and safety for patients, doctors, and others is the use of telehealth technology. Telehealth is the provision of medical services by health professionals in locations where distance is a concern, using information and communication technology (I.C.T.) to transmit reliable data. The methods used by telehealth services include real-time, in-store, and forwarding. Many families now have at least one digital device, such as a smartphone or webcam, that allows connection between a patient-provider and a health care provider due to the rapid development and decrease of portable electronic gadgets.

To lower the risk of exposure to other people and staff members, video conferences and similar television programs offer health care programs to hospitalized or isolated patients. Remote patient care is possible with the help of these services for separated doctors. Additionally, a telephone doctor who covers various sites can help employees with some of their problems.

Numerous organizations in India, including hospitals, e-pharmacies, governments, etc., adopted and put into practice telemedicine and teleconsultations based on WHO recommendations during the continuing COVID-19 crisis. These were carried out in accordance with directives issued by the Board of Governors of the Medical Council of India (MCI), N.I.T.I. Aayog, and the Ministry of Health and Family Welfare.

5.2 eSanjeevani National Telemedicine Service:

As part of the Ayushman Bharat Scheme of the Government of India, the Ministry of Health and Family Welfare has introduced e-Sanjeevani, a doctor-to-patient telemedicine system, throughout the nation. It is an all-encompassing web-based telemedicine system. Through e-Sanjeevani OPD, anyone can get medical advice and prescription drugs via audio and video.

The establishment of this service will allow individuals who reside in the most remote areas to now access medical consultations.

By bridging the digital divide that exists between urban and rural areas, as well as between rich and poor people, e-Sanjeevani seeks to increase the equity of healthcare services in addition to improving the quality of medical services and addressing issues like unequal distribution and a lack of infrastructural and human resources. The medical education offered by e-Sanjeevani can be advantageous to interns, employees from various Common Service Centers (CSCs), and others.

As a result, it is acceptable to conclude that telemedicine is a basic necessity for all individuals, health care providers, and COVID-19 patients, especially when people are isolated, allowing patients to contact a health care provider for

advice on their health problems in real time. Telemedicine should be a crucial tool in the fight against the COVID-19 pandemic, allowing for constant access to critical health services.

There are two variants of eSanjeevani telemedicine service:

I. eSanjeevani AB-HWC (Doctor to Doctor teleconsultation):

Under the ambit of Ayushman Bharat Scheme, MoHFW is setting up 1.5 Lakh Health & Wellness Centres (HWCs) in States/UTs for providing preventive and promotive services. One of the component under services is providing Tele-medicine consultation service. CDAC Mohali has developed eSanjeevani Telemedicine application.

II. eSanjeevani OPD (Patient to Doctor teleconsultation)

In wake of COVID 19 pandemic, MoHFW upgraded 'eSanjeevani' application to enable patient to doctor teleconsultation to ensure continuum of care and facilitate health services to all citizens in the confine of their homes free of cost. Telemedicine services have been rolled out in 36 States/UTs. More than 1.4 crore teleconsultations have been successfully completed so far through eSanjeevani Platform.

6. Conclusion

The current healthcare system is unable to provide equity in healthcare and ensure access to health because of a lack of resources, an uneven distribution of those resources, geographic barriers, subpar infrastructure and treatment, poorly qualified health workers, a lack of public awareness, outdated working conditions, and other problems.

1. Despite the fact that technology developments have increased access to and equity in healthcare, we still lag behind.

2. Providing healthcare access and equity for people who live in rural areas may be achieved through telemedicine. However, patients must travel far to urban areas to visit pharmacies in order to get the prescribed medications, which defeats the main goal of telemedicine and teleconsultations.

3. Despite the fact that telemedicine is frequently used to guarantee access to healthcare, rural areas still lack the technological advancements necessary to use telemedicine and teleconsultations.

4. Telemedicine has been practiced for a very long time in India. In response to COVID-19, which legalized telemedicine in India, Telemedicine Practice Guidelines for 2020 were published. While providing telemedicine services, there is a lack of clear legislation governing medical confidentiality, the standard of healthcare, the credentials of physicians, and informed consent. The aforementioned legislation should also provide specific guidelines for certification, compensation, clinical incompetence, obligations, fraud, sanctions, and civil liability.

5. Information about a person's health is thought to be particularly private and confidential. However, given the absence of legislation governing the subject, concerns about privacy and confidentiality deter people from adopting telemedicine as a way of consultation.

7. Suggestions

1. The government should make sure that alternative practices, including telemedicine, are incorporated into the current healthcare system through legislation and regulation in order to guarantee citizens' rights to health care.

2. Efforts to connect the smallest administrative and healthcare units, such as Public Health Centers (PHCs) and Health & Wellness Centers (HWCs), to larger hospitals and medical college hospitals must be made in addition to government measures to extend fiber optic connectivity to rural locations. The middle term is crucial for objective appraisal. A review of the current public and private telemedicine programs, including eSanjeevani, is long overdue. The evaluation's findings should be applied to future revisions of the rules and legal framework.

3. Medical practitioner education is the immediate issue that needs to be addressed in the near future. 'Crash courses' in telemedicine or CME (continuing medical education) modules can help practitioners become more aware of current issues and developments in technology, ethics, and law.

4. Telemedicine has advanced and been successful for many years, but it is still not a fully integrated part of the healthcare delivery system. The success of telemedicine depends not only on its deployment as a stand-alone project, but also on its integration into the healthcare delivery system. As was already mentioned, it is now crucial to transition telemedicine from a trial phase to a regular operating phase in the mainstream health-care delivery system.

5. The Telemedicine Practice Guidelines, 2020 have made telemedicine more widespread, however guidelines are not enforceable until they are supported by legislation. In order to assure the appropriate operation and regulation of these services in India, a specific law governing telemedicine and teleconsultations should be passed.

6. The recommendations are unclear with regards to patient and practitioner privacy and data use. They give doctors full responsibility for keeping track of all encounters with patients. The standards do not yet outline how long data must be stored or under what circumstances it may be used in the future. In essence, the recommendations emphasize that professionals must be aware of and follow any applicable data protection and privacy laws. Privacy issues emerge when a practitioner is required to record information like a patient's address and other "reasonable" identification.

7. The very act of starting a telemedicine consultation is deemed to constitute implicit consent, despite the standards making a distinction between implicit and explicit agreement. The recommendations should provide more details on consent in teleconsultations, including how to get it and how to record it.

8. In order to conduct consultations via telemedicine, it is necessary to have an open network that guarantees that telemedicine services are securely available to the general public, protecting the privacy and security of the doctor-patient relationship.

9. Medical professionals who use telemedicine (or chats with patients about any other audiovisual means) frequently prescribe medications only through telephone contacts. As a result, the biggest barrier to the delivery of telemedicine services in India continues to be the legitimacy of e-pharmacies and tele-pharmacies. In order to ensure that telemedicine services are provided in India, e-pharmacies and tele-pharmacies should be legalized.

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