**Title: Telemedicine in India a review**

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**Abstract:**

Advanced technology has increased the use of telemedicine and Information Technology (IT) in treating or rehabilitating diseases. An increased use of technology increases the importance of the ethical issues involved. The need for keeping practice can prevent the transmission of information confidential and secure, controlling a number of therapists' inefficiency as well as raising the quality of healthcare services necessitates adequate heed to ethical issues in telemedicine provision. The government is committed to providing equal access to quality care to all and digital health is a critical enabler for the overall transformation of the health system will minimize inequality and barriers to access. This article is important for potential forensic practice of telemedicine in India because of knowing ethical issues in telemedicine and technology are always important factors for physician and health providers. Therefore, suggestions are made to investigate ethics in technology, to offer development, application areas, benefits, forensic issues, doctor-patient relationship, rights of patient, and barriers in implementation etc. Due to the advancement in technology as well as Different types of telemedicine services like store and forward, real-time and remote or self-monitoring provides various educational, healthcare delivery and management, disease screening and disaster management services all over the globe. Even though telemedicine cannot be a solution to all the problems, it can surely help decrease the burden of the healthcare system to a large extent.

**Keywords:** Introduction, telemedicine, forensic Issues, Major challenges and barriers in implementation, legal perspectives, practice in India, recommendations.

**1. Introduction**

“Telemedicine is the natural evolution of healthcare in the digital world”.

According to American Telemedicine Association (ATA)

There is a GLOBAL Revolution in healthcare system due to IT (information technology) and communication technology. Majority of population of India that is two-third is living in rural areas where health care needs are immense. The Indian government is strengthening the HCS (health care system) and giving primary focus on the use of telemedicine services. So that the patients living in remote and urban areas can receive best possible care in short duration of time. To enhance the system at grass root level especially in Health and Wellness centers.

Earliest records of use of Telemedicine are in the era of ECG, where ECG was transmitted by telephones lines. Telemedicine has come a long way now due to advancement in IT sector [1]. In 2005, health ministry of Indian government setup an NTT (National Telemedicine Task) force and various others projects like ICMR-AROGYASREE, VRCs and NeHA [2]. Later on, 25 March 2020 published guidelines for Telemedicine practice as **TELEMEDICINE GUIDELINES** [3]. According to these guidelines it is now legal in India to practice Telemedicine by registered medical practitioners i.e., MBBS and above. Further clarification about the patient and doctor are stated as doctor can provide consultation to patients of any state via telecommunication but have to display their registration number in all communication methods like in emails or messages through WhatsApp and also on the prescription and fee slips. But for chronic diseases doctors should have to be careful on issuing any medicine and may avoid teleconsultation if it is not the routine consultation or refill of an earlier prescriptions. The first teleconsultation between patient and doctor need not to be in-person [4].

“**Telemedicine Practice Guidelines**” released by the efforts of NITI Aayog and Ministry of Health and Family Welfare, India has been included by the MCI (Medical Council of India) as an amendment in the regulations, 2002 adding 3.8 titled, **Consultation by Telemedicine** are included in as Appendix 5 [5]. Telemedicine Practice Guidelines-2020 will be applicable during and after Pandemic, and also get legal status under the National Commission Act, 2019.

**2. Telemedicine:**

*“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.”*

According to World Health Organisation (WHO)

* **Description**

Telemedicine is a word where *tele* stands for distance so, it’s healing from a distance. In India Ayushman Bharat initiates “**e-Sanjeevani**” [6]. The **e-Sanjeevani is** a telemedicine service that is equally accepted among patients and health care providers and enhancing the HCS of India which is a developing nation having 138 crores of population [7]. In time of pandemic Telemedicine provides safety to both the patient and care giver as we can see in COVID 19, contagious risk can be shortening. Due to technology advancement the medical practitioner can monitor vital parameters and can manage better treatment such as blood sugar monitor, BP measurement etc.

Telemedicine Software forms a bond between the patient and doctor by using audio and video mode. The sick patient from any remote area can easily connect to the care giver and doctor will be able to manage the treatment and clinical data himself. The information shared during audio and video mode should be secured and confidentiality to be maintained by the doctor so that one can easily share their images and report electronically. A software name as **Doc-Engage** provides telemedicine in India and also allow a self-assessment procedure prior meeting to a doctor [8].

**Origin** of telemedicine can be understood by some earlier societies by giving smoke signals to spread the news of any sick to nearby area. Use of ancient scrolls and hieroglyphs, later in 19th century use of telephones and typewriters connects the patient and doctor. During the world war the telegraph was the mediator between the injured and health care provider. The 1950s brought the development of Television and later in 1959 telepsychiatry was done using videoconferencing in the Nebraska Institute. During 1970s and 1980s NASA (National Aeronautics and Space Administration) provides the telemedicine services to various states such as New Hampshire, Alaska, Arizona and Washington. NASA provides a major role in development in telemedicine so is the ISRO in India [9]. Later on, the internet provides the greater improvements in sending medical records such as x-ray scans, ECG.

### Telemedicine before COVID-19

Telemedicine is a combination of both technologies and devices to gain the information of the patient and in giving aid. The utilisation of telemedicine has been increased in developed nations. In USA alone the percentage of use of telecommunication and consultation increases from 35% to 76% from 2010 to 2017. The American Medical Association claimed that insurances claimed by the citizen increases by 53% from 2016 to 2017. In late 1960s the telemedicine first began as a health care delivery due to the need of NASA. The lack in the infrastructure of internet is the major challenge in establishment of telemedicine. On 17 March 2010, US President proposed ‘Connecting America: The National Broadband Plan’ to improve the internet network issue. This plan helps in improving medical facilities in remote areas. Tele-stroke has become specific telemedicine service in USA since 1999 after its introduction. Despite the rise in use of telemedicine certain obstacles like legal and regulatory challenges prevents its further expansion. Researchers have found that certain practitioner of health such as radiologist, cardiologist and psychiatrist use teleconsultation more as compare to gynaecologist, gastroenterologists and immunologists. Different countries issue different regulatory boards and different policies for implementation of telemedicine. Although many states use similar policies in developed nations but there is noticeable differences creating a confusion for telemedicine environment.

* **Development {Telemedicine& COVID 19}**

Telemedicine is a real time interactive communication to improve patient’s health. During the current COVID-19 pandemic this service is rapidly evolving to provide high quality health care. It turns out to be both efficient and cost effective in today’s time. Due to recent technology development advancement in network, mobile phones and various application features appropriate tools are reaching and monitoring especially dealing with chronic diseases, patients requiring periodic follow-up. Telemedicine can be divided broadly into four categories on the basis of service: video conferencing; store and forward; m-health (mobile health); patient monitoring [10].

**Telemedicine can be classified into 5 basic types:**

### Role in family medicine

Telemedicine is now migrating health care treatment from hospitals to homes, globally as well as nationally. India is a nation where health facilities in rural areas are not same as in urban areas so it helps in monitoring patient at remote area with a help of CTI system (system allows close monitoring of vital stats of the patient by the family physicians). It saves their money, travelling time, no need to wait for hours in order to get the appointment. When needed telemedicine also allows the family physician to consult a specialist to cross verify any doubt and consultations. For example, in case of doubtful ECG report can be verified from the cardiologist. For formulating ideal diet chart for diabetic or bed ridden patient.

* **Application areas**

1. For Educational purpose

Tele-conferencing: It is between the medical practitioner via different modes like conferences, seminars or any virtual programs.

Tele-education: A multipurpose flexible program to provide new information and new treatment procedures throughout the world.

2. Healthcare distribution

Mobile health clinics: A fast way of communication between physician and patient living in remote areas.

Transportation: Helps and avoid unscheduled diversions during travelling of patient in emergency.

Wellness center: Telemedicine allows interaction between the wellness center in-charge and the doctor through telemedicine.

3. Healthcare management

Tele-home care: Remote patient monitoring at their homes with help of computer aided programs.

Tele-health care: Teleconsultation and follow-up through telemedicine in pandemic scenario.

Various tele-diagnostic services like tele-radiology, tele-psychiatry, tele-cardiology and tele-surgery provides specialties to the patients.

4. Screening of diseases

Various government projects help in screening of disease earlier:

Diabetic screening project by MDRF: The Chunampet Rural Diabetes Prevention Project.

Ophthalmology screening by Aravind Hospitals at Andipatti village.

5. Disaster management

Today it is possible because of NASA and ISRO. A portable telemedicine system with satellite connectivity can help at the time of disasters where other modes of connectivity are not possible. Two main examples of this are recorded in 1988 and 2004. NASA tele-medicine services provided during 1985 Mexico City earthquake and 1988 Soviet Armenia earthquake. Amrita hospital tele-medicine services provided during 2004 Tsunami disaster [11].

**Tools for Telemedicine**

The health care provider may use different telemedicine tool for carrying patient consultation it can be over telephones, audio-video devices connected with internet, LAN, WAN, mobile phones, chatting apps like WhatsApp, Messenger, email, fax or Skype etc.

**Purpose**

The main purpose of telemedicine is to obsolete geographical and functional boundaries between health care services. It’s a tool that is providing health care facilities to remote and rural areas becoming popular because of its cost effectiveness, as well as allows health care professionals to monitor, diagnose and treat patient. Gathering patient information without patient stepping in to the hospital.

* **Benefits**

The activities related to [telemedicine started in 1999 in India](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6618173/), though the government recognized the potential of telemedicine in the year 2000. The Indian Space Research Organization deployed the first nation-wide SATCOM-based telemedicine network in 2001. 68% of population resides in villages in India where the health care services are deficient, telemedicine can fill the gap by the efforts of government and private sector [12].

* When we can see our doctor on the screen then we can save time for the transportation and money on the transportation. Hence making telemedicine both time and cost effective.
* Speaking from work place to the medical care giver become possible because of telemedicine. Video calling largely remove the need of taking off from work. So, maintain the employees’ efficiency at the office and saving their time. Hence no need to take time off from the work place and can easily follow-up instruction and maintain our health.
* With coming time most of the families living in urban areas are nuclear. For them it is quite cumbersome to hold elder patients and taking care of infants as well. Bringing all along can be stressful and unpractical. With telemedicine we can eliminate child or elder issues.
* Patients who need special treatment for their diseases can interact with medical specialist through telemedicine. Access to specialist become easy now no need to travel 100kms in seek of advice. The care giver can interact with the specialist at home and can-do monitoring of vitals.
* Telemedicine practice offers less waiting room time for the patients who are at the center as most of the person will interact through video technology. So for the patient visiting health centers their time will be reduced.
* When we are at home than there will be minimal chances of coming in contact with other ill patients, that are visiting the doctor hence the less chances of spreading new illness. While staying at home provides you the required rest and keep you away from communicable diseases.
* When we have enough sessions of visit via telemedicine to the physicians, we can opt for better healthy life style. We can manage better management of medications and chronic diseases.
* We can avail the on-demand option available in the market that can provide insurance as well as regular appointments with the doctors.

**Telemedicine has turned out to be beneficial for not only patients but also doctors and hospitals.**

**3. Forensic issues**

**Telepsychiatry within forensic practice**: According to the Yellowlees et al. (2008)

*“Telepsychiatry refers to the use of telemedicine to deliver mental health services from a distance”.*

To secure hospitals and prisons from last two decades there has been increase in use of telemedicine communication technology as facilitators find it difficult to arrange medical practitioner visit to the centres and difficult either to arrange visit of mental ill prisoners to the health care. In Forensic health settings this technology has been shown effective and safe for clinical trials. By considering literature there are evidence of reliability and effectiveness with acceptance of mental health in Forensic setup. Researchers shows that in future telemedicine will provide better and effective medical care and legal prospectus [13].

In countries like India where geographical area is diverse, population spread is vast and infrastructure is a measure issue, the use of telemedicine can reduce the need of prisoners requiring psychiatric help and save time and money due to long travelling. Follow up and assessment can be done from the distance.

One of the major issues is with the security which is potentially maintained by telemedicine. During time of hospital or psychiatrist visit easing the transport of the culprit or the prisoner is of great security risks and require high level of supporting staff [14]. So, in such cases telemedicine provides the needed security and safety. In India telepsychiatry would be particularly beneficial for providing forensic skill in courts and judicial system.

**Telemedicine in child abuse:**

The role of telemedicine in child abuse cases extends back 20 years, well before the formal recognition.

The aim of telemedicine in case of child abuse are to deliver :

* An experienced medical specialist to the rural area where experts are less as compare to cities.
* Supporting system of professionals to overcome the emotional status of the child.
* A method of peer review in providing opinions in sexual abuse cases.
* Telemedicine consultations raise the standard of care in child.

The need of telemedicine in child sexual abuse cases arise from the perspective of caregivers living in rural area where review findings with an expert is difficult. In addition, the examination of child may be delayed for a period due to travel involving.

**4.** **Telemedicine in rural urban area**

The platform enables medical care access to remote as well as urban areas through out the world. The telemedicine provides collaboration of experienced doctors with the nurses and other health care giver to the critical patients. It also improves patient’s satisfaction of people living in villages and patients in ICU. **National Digital Health Mission** started by Indian government will push the telemedicine in coming years. Due to COVID-19 the poor infrastructure of hospitals in rural areas, lack of staff and diagnostic modalities has exposed India’s health care services. Shortage of sub-centres, PHC’s, CHC’s that is 23%, 28%, 27% respectively is noticed [15]. Lack of physicians compounded these gaps more challenging. Distance to the health care facilities and poor connectivity to the roads are other factors which hinders the villagers in obtaining health treatment. As per records of NFHS, 30% of the women patients find it difficult to reach hospital in rural areas [16].

In urban areas the major problem in accessing health care treatment is the money. Most of the metropolitan cities have good infrastructure and have advance technologies, adequate road networks and public transport system. Jim Reid, who was behind the Eastern Montana Telemedicine Network mentioned that “*“Rural residents face unique obstacles to gaining medical care. Access to care in an urban setting is often discussed in terms of having the resources to pay for medical care. In rural settings, access refers to having the ability to physically get to health care providers. Mountain ranges, harsh climates, hazardous winter roads, deserts, and undependable island transportation present obstacles to gaining medical care”.*

COVID-19 spread and lockdown implication for its prevention, strengthen the telemedicine in India. As Telemedicine Practice Guidelines were released by MCI in March 2020, telemedicine service gains a strong push while ensuring social distancing. Numerous Apps and platforms setup by private, government companies and Start-up programs of the country were launched rapidly. Some of the platforms provided by the government are free of cost.

Many private hospitals have already made telemedicine as a part of their management in India. Some private clinics are also following the trend. The burden over hospitals during COVID-19 can also be reduced by providing diagnosis and treatment by telemedicine. Training to the care provider of sick and disabled patients can also be possible by telemedicine. In 2015 Cochrane examined the impact of tele health services with in-person visits and found similar health outcomes in both [17].

* **Doctors- Patient’s relationship**

Health education- the physician may provide information regarding immunization , contagious infection , diet plan, maintain hygiene etc by telecommunication. May provide counselling session to the patients, prescribing medicine. The potential risk regarding patient’s confidentiality and security need to be addressed for this the Indian government The Ministry of Health and Family Welfare released a ‘Charter of Patients Rights’ that compiles the rights of patients.

* **Malpractice**

Malpractice occurs when medical professionals fail to competently performs their medical duties towards patient. Here we will try to examine how malpractice arises from telemedicine can be resolve. Malpractice action must establishthe following elements:a duty by the physician to act according to certain standards; a breach of the applicable standard of care;an injury to the patient; a causal connection between the breach of care and the patient's injury [18]. Telemedicine may minimize the errors and improve the results with the aid of algorithms assisted diagnosis and data collections.

Highlights of Malpractice Insurance –

* Availability of multiple state coverage.
* Policy premium based on time worked in each state. All specialties available including: dermatology, pathology, internal medicine, radiology.
* Cyber insurance can be avail due to increase exposure over internet.
* Various Malpractice insurance limit the options to individual requirements.

**5. Major challenges of telemedicine practice in India**

* **Lack of basic infrastructure**

The lack of telecom infrastructure and poor internet facilities in rural areas. The knowledge and education for operating smart phones, resources lack for poor people are the common hinderance in accessing telemedicine throughout India.

* **Need for proper training**

Proper training programs to be applied for the better use of telemedicine in a telehealth institute. With the advancement of technologies proper understanding of tele health software are necessary.

* **Structural challenges and awareness**

Telehealth industry faces many challenges, regarding reimbursement of money and regulation and adoption of technology. Practice regulation are barrier because there is multistate system with multistate practices. Telemedicine also encounters barriers with food and drugs administration (FDA). Sec.1834 of the Social Security Act limits use of telemedicine in certain areas. AMA recently proposed resolution to overcome this regulation [19].

Application of mobile telehealth may have lots of potential but need to be embraced by health care practitioner.

6**. Indian legal pertaining to the application of telemedicine**

Telemedicine laws providing a new increasing rule that can be used by health care providers in building a model of health care. The kinds of legal and regulatory issues we challenge include: Advice to telemedicine companies, licensing issues, Drafting agreements and FTC issues for online health apps. Some states allow special telemedicine licenses while others simply prohibit telemedicine by requiring that physicians be licensed in-state to diagnosis or treat any patient in-state and country [20]. Telemedicine and E- health Lawyers gives the necessary advice regarding legal rules to their clients. Some states allow special telemedicine licenses while others simply prohibit telemedicine by requiring that physicians be licensed in-state to diagnosis or treat any patient in-state and country. It is the duty of health care professionals to have legal safety guard information for the seekers and maintain privacy and security issues (HIPAA) [21].

**7. Guideline for telemedicine practice in India**

Treatment through web-interface or telemedicine it is important for the RMP (registered medical practitioner) to ensure that the prescriptions issued should satisfy the Drugs and Cosmetic Rules 1945, without which, the prescription will be invalid in the eyes of the law. The IT act 2000, should also be followed during practicing telemedicine regarding safety and security of data and confidentiality of patient [22]. Specific laws pertaining to Telemedicine practice to be consider in relation to license and ‘medicine’.

Some Regulatory Framework Governing Telemedicine practice in India: [23]-

• National Medical Commission Act, 2019 (“NMC Act”)

• Telemedicine Practice Guidelines (“TPG”) Issued under the MCI Code

• Drugs and Cosmetics Act, 1940 (“D&C Act”) and Drugs and Cosmetics Rules, 1945 (“D&C Rules”)

• 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”)

• Government Policies Regulating Health Data

• Other Service Providers Regulations under the New Telecom Policy 1999 (“OSP Regulations”)

• Telecom Commercial Communication Customer Preference Regulations, 2018 (“TCCP Regulations”)

**Recommended Guidelines for Practice of Telemedicine in India**

The Department of Information Technology, Ministry of Communications and Information Technology issued Recommended Guidelines & Standards for Practice of Telemedicine in India (“**Guidelines**”) in May, 2003 [24]. As the name suggests, these Guidelines are not binding, although it is advisable to follow them as various issues arising from Telemedicine have yet not been tested by Indian Courts. The guidelines cover the information regarding introduction of telemedicine its definition and concepts the process guidelines.

* Recommend that health care provider should have unique identification that will help in easily recognition of him by the patients and it will flow through all its programs.
* A unique code to the telemedicine center that should be universal to separate it from another program.
* Further recommendation is about patient unique ID or code so that a database can be generated, and data can be move across without the fear of loss of data.
* Guidelines provide sufficient risk involvement at various stages in the process of telemedicine and Telemedicine organizations.

**Guidelines for RMP**

Both the participants need to identify each other before examination. The RMP is required to gather data and information about the patient and in the same way the patient has the right to verify physician’s registration number and license it should be displayed on the platform. In case the patient is a minor an adult should company him and provide his details before teleconsultation. Examination where consent of patient is needed can be provided by the electronical means. A RMP can issue prescriptions directly to the pharmacy after proper consent of patient [25]. A practitioner can prescribe most drugs following teleconsultation, other than those drugs listed in Schedule X to the Drugs and Cosmetics Act, 1940 or drugs under the Narcotic Drugs and Psychotropic Substances, Act, 1985 [26].

**Guidelines for IT platforms**

Technology platforms which are providing telemedicine are required to ensure the authentication of RMP before patient interactions. The name, registration number and qualification of physician must be displayed on the platform. Any information about mis-conduct must be reported to relevant authority that is to the MCI. Technology platforms based on AI (artificial intelligence) are not permitted for giving prescriptions or consultations but they may help physician for assistant purpose [27]. When a platform does not follow Guidelines then the said platform should be barred.

**8. Pitfalls in telemedicine**

During the time of COVID-19 pandemic, Telemedicine become a rising tool in providing patient care. But in case of remote areas various pitfalls are coming that should be avoided by exploring their cause. The guideline issued by the government of India for telemedicine clearly dictate the limitations of tele-communication and e-consultation. There are 72.96 million cases of diabetes in adult population in India (INDIAB Study, 2019) and during the pandemic management telemedicine plays avital role in case of diabetic patients [28]. From various studies from past, telemedicine is time and cost effective as compare to traditional care methods. Although the equipment required for the telecommunications are must for providing teleconsultation on the both sides. The main disadvantage is availability and cost of the set-up. Telemedicine can be costly for smaller health care givers. Certain type of illness requires face-to-face assessment so cannot be diagnosed by telemedicine. The bond between the care giver and the patient may not be as strong as compare to patient receiving it in the wellness centre. Though no service is perfect for all, but telemedicine is an upcoming field in HCS. Drawback of telemedicine can be understood from following :

* Telemedicine depends upon the internet network which is highly affected by weather conditions. The electronic system of telemedicine relies on electricity. So, the online visits highly depend upon these circumstances.
* Hesitance of the doctors in providing online sessions and putting their faith on videos only is tough for their inner satisfaction of treatment without touching and feeling the patient.
* Physicians and medical staff required to be train on new systems and equipment. Need of hiring IT staff and cost of new equipment are the disadvantage of telemedicine.

The telemedicine market is expected to rise up to 41 billion US dollars in 2021 (report of global telemedicine market) [29], [30].

**Methods to prevent pitfalls in telemedicine**

* By providing training to the medical staff and teaching skills to deal in remote areas. Training will provide the necessary efficiency, communication and satisfaction.
* A valid consent before providing consultation in remote areas is a must. It is a safeguard both for the patient and health worker.
* Principles of medical ethics should be maintaining as per MCI guidelines [31].
* Power backup at telemedicine centers to avoid any communication gap.
* Appropriate insurance is held to the level of clinical care provided and assist in any medico-legal claims.

**9. Distribution of telemedicine technology aids in rural in India**

**ISRO** (Indian Space Research Organization) plays a key role in establishment of telemedicine in India where 75% of doctors living away from rural areas in spite of the fact that majority of Indian population lives in rural areas [32]. Due to this fact equitable distribution of healthcare services is needed [34], [33]. A telemedicine pilot project in 2001, with help of ISRO and Apollo hospital in Chennai initiated at Apollo Rural Hospital at Aragonda village in the Chittoor district of Andhra Pradesh. Few more examples where telemedicine successfully established in India are: mammography services at Sri Ganga Ram Hospital; School of Telemedicine and Biomedical Informatics; surgical services at Sanjay Gandhi Postgraduate Institute of Medical Sciences; telemedicine practice during Maha Kumbhamelas in UP and many more. Other programs which are using telemedicine in India are from private sectors in support with government are Narayana Hrudayalaya, Apollo Telemedicine Enterprises, Asia Heart Foundation, Escorts Heart Institute, Amrita Institute of Medical Sciences and Aravind Eye Care [36].

In the past few years, telemedicine facilities are improving in Indian rural and urban areas. 45 rural hospitals from remote areas and 15 super specialty hospitals are now connected with telemedicine [37]. The remote areas cover Andaman and Nicobar and Lakshadweep to Jammu and Kashmir and Medical college of Orissa [38].

* **Current scenario in India**

Telemedicine services in the country are govern by the combination of MoHFW and Government of India. A portal on telemedicine for implementation of a ‘green field project’ on e-health establishing link between Medical Colleges for the purpose of e-Education and NRTW (National Rural Telemedicine Network) for the purpose of e-healthcare are formed by the government [39]. The National Health Portal (NHP), National Digital Health Authority of India (NDHAI)/National e-health authority (NeHA) is set up by the government for achieving high quality health services. To secure the data MoHFW develops an electronic health records in 2013, and further revised version is launched in 2016 [40],[41],[42].

AYUSH telemedicine aims to promote the traditional medicine methods in India. VRC (Village Resource Center) concept has been developed by ISRO to bring the various tele services like education, medication, weather services, tele-fishery, e-governance to the rural areas [36]. Almost 500 such centers are established till 2020 in India, thus bringing experts services to the villages. AROGYASREE is one more mobile-internet service-based telemedicine application that joins rural clinics to medical specialist and multiple hospitals, a project initiated by ICMR (Indian Council of Medical Research) [43], [44].

According to Sathyamurthy. “There are some who needlessly fear that they will lose their jobs. Although the systems are user-friendly, there are others who are affected by the fear of the unknown in handling computers and other equipment. There is a feeling that the initial investment is high and hence financially not viable.” Hence application of telemedicine in India is full of challenges [45].

Digi-Gaon is recently launched by Indian government to make telemedicine easily accessible to the villagers. A report released by McKinsey Global Institute (MGI) has estimated about 4 billion dollars to 5 billion dollars gain every year due to the implementation of telemedicine. MGI is the business and economics research arm of McKinsey & Company. The internet subscriber in India is 560 million which is 40% of total population, India is digitising faster than any other country.

**10. Recommendations of telemedicine practice in India**

Present situation of pandemic gives rise to use of telemedicine effectively in the country. The guidelines provide a base for the teleconsultation its benefits and consequence. Commendable aspects that help in unlocking the potential of technology. Improvements in network and proper guidance to the staff can help in proper implication of telemedicine. Beforestarting a virtual health program, leaders should conduct a needs assessment of the organization and the population it serves to identify the most appropriate virtual health solutions, current technological capabilities, future technological needs, and how to bridge the gap. The issue of health care is crucial in spite of financial status of the country continuous efforts are to be made by our policy makers, researchers and administrators to make it more cost effective. The sudden onset of pandemic in India puts lot of pressure on the hospitals. The pandemic saw rise in platforms providing telemedicine in the country. For coming time physician of India are believing that even if the lockdown lifts completely the teleconsultation are here to stay longer to keep safety of clinicians and patients from infections.

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