IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Telemedicine in India- Perspective and SWOT analysis

***Dr. C. M. Thyagaraja**
Professor, Department of Business Administration, Rani Channamma University, Belagavi, Karnataka - 591156

**** Ms. Lakshmi S**
Research Scholar, Department of Business Administration, Rani Channamma University, Belagavi, Karnataka - 591156

Abstract

Until the end of 2019 there was a question in one's mind as to "whether technology is changing healthcare or healthcare is changing technology"? As an answer to this, current (pandemic) scenario has shown us how technology is changing healthcare industry. A year ago, we never thought that we would see doctors on computer screen, but today it has become most common and this will create a forum for molding the future of healthcare. In recent years one of the most important changes happening in the medical industry is **telemedicine**. Telemedicine is a field in health science, it is a combination of Information and Communication Technologies (ICT) with Medical Science which creates a unique platform for meeting the challenges of healthcare delivery to outpatients in urban as well as in rural regions. This study reveals the impact of telecommunication technology on healthcare services which has helped in reducing the turnaround time.

Key words: Telemedicine, healthcare, technology.

I. Introduction

In today's world technology has become part and parcel in every industry as well as in one's personal life. Though technology stepped into healthcare industry a bit late, it started gaining importance at a faster rate, and because of this it has become possible to improve and save innumerable lives around the world. Apart from this, technology in medical field has a massive impact on nearly all processes and practices on healthcare professionals. It is technology which is considered to be the driving force behind the major improvements in healthcare. Technology has created a pace for healthcare community to improve patient care. . India is a vast country with large geographical area, and a population greater than 136.26 crores. Currently the subject health is in the state list but a lot of voice has been raised to shift health subject to concurrent list as medical education and family planning comes under concurrent list. The government provides healthcare in three tier system and this is the primary responsibility of each state. It has been observed that there has been a lot of disparity in quality and access to healthcare in urban and rural areas. This gap can be bridged through the use of telemedicine in healthcare delivery system. Telemedicine provides a platform for healthcare providers to provide remote diagnosis and treatment for patients by means of telecommunication technology, thereby providing substantial healthcare to urban as well as rural patients. Telemedicine has witnessed spectacular growth during the last few years due to the convergence in the area of Information Technology.

Though the evolution of telemedicine dates back to 1900s which can be traced to the introduction to telegraphy, there were a lot of growing disparities as some people had access to new knowledge and expertise while others did not. Advances in telecommunication and information technology has helped to overcome these disparities by redistributing the knowledge and expertise to when and where it is needed, and this has paved way for telemedicine to gain its importance and popularity in recent years

India being a vast country with inherently contrasting geographical, cultural and economic features has a high population growth rate, high percentage of population in rural area, high rates of illiteracy, poverty and unemployment. All these factors contribute to the challenge of equitable distribution of healthcare services and this has become a major goal for public health management. Adding to this, the rural population in India was reported at 65.53% in 2019.

Indian healthcare delivery system provides primary, preventive and curative health care with its three-tier system- primary health centre catering a group of villages, secondary health centre located at district level, and tertiary healthcare level comprises of medical college hospitals located in city areas. Besides, there are few advanced medical institutes of national importance having clinical, teaching and research facilities in many super-specialties. In spite of nationally driven health programs under National Health Mission (NHM), access and fulfilment of healthcare needs for much of the population in rural areas is still inadequate. The lack of healthcare human resource- doctors and specialists, lack of organised continuum of care, prescription and dispensing of drugs are the major challenges in rural areas. These challenges can be reasonably effectively addressed utilising the information technology in delivering healthcare services.

While many countries were already using video conferencing via new telecommunication technologies, Indian doctors were having no resources or minimal resources to make use of the latest technologies. It was during this period when doctors started approaching telecom companies and government for their support to inculcate new technology in healthcare.

Dr SK Mishra, the Professor and Head, Dept. of Endocrine Surgery, SGPGIMS was the first doctor in India who dreamt about using advanced telecommunication technology in healthcare and worked hard towards achieving the same. Between February to October 1999, he succeeded in establishing the required ISDN network with the help of a telecom company which could cover an area with a radius of up to 2500kms and in October 1999 Dr Mishra invited surgeons from France and Europe to deliver lives of the procedures using this video conferencing setup. During this experiment stage, when telemedicine was hardly realized by many people, electronic and communication ministry granted an amount of fifty-six lakh rupees in 2001 which made a lot of change in creating the infrastructure and this was the first grant for research in telemedicine. In 2001, the mass gathering called maha kumbha mela took place in Allahabad on the junction of river ganga and Yamuna which is now called prayag. This mela occurs ones in twelve years and it witnesses a gathering of millions of people who stay there for one and a half months. During this mela, a temporary district will be created and all the facilities will be provided to the pilgrims. Though temporary, this mela will be having an extreme environment creating a huge demand for sanitation and healthcare facilities which would cover all the cases from primary to specialist care. Catering to the medical needs of this large population created an opportunity to experiment telemedicine with all the experience the panel had till then. Team of doctors and a company from Ahmedabad named Online Telemedicine Research Institute took orders from government, arranged all the required equipment's which were transported via aircraft and installations were done in short period of time. ECG, X-rays and many other machines were installed and the pictures from these machines were transmitted from the remote region. Through this setup, it was possible to give remote consultation, and remote monitoring of public health in terms of water quality evaluation was also done. The telemedicine network here connected five nodes which included mela site field hospital, local medical college at Allahabad and SGPGIMS, public health department and mela monitoring cell at Lucknow which was located 300kms away. There was a regular exchange of health-related data and video conferencing happening among these five nodes. Finally, the team was successful in experimenting telemedicine for about six weeks which helped in combating the major disasters that could happen in the huge gathering. The first national conference on telemedicine was held in 2001, like minded people who participated in this conference created an association named Telemedicine Society of India to promote scientific promotion and advancement of telemedicine in India.
ISDN technology had problems of its own and it quickly vanished from the scene by the 2002, as it did not have enough bandwidth and could not provide continuous connectivity. Then in 2003, the satellite communication started stepping into telemedicine industry, a government organization ISRO started providing satellite communication with a bandwidth of 300Kb to connect centers for telemedicine and this was first deployed in Orissa. Demand for bandwidth kept growing year on year and providing the same became a challenge for government as well as telecom companies. By 2005, internet technology already checked into the telecom market, even then the remote areas were served by satellite communication. Until 2006, IT ministry was providing grants to do pilots and develop technology and ISRO was providing satellite communication. In 2006, health ministry of India started expending on research and development related to telemedicine. This played a crucial role in developing telemedicine in India.

Along with government institutions, corporate or private institutions also started entering into telemedicine, which in turn helped them in developing medical tourism. As we all know that medical treatments are available at a cheaper price in India, so through telemedicine in became possible to attract more and more clients from central and south-east Asia, Australia and also from other parts of the world who could be connected through video conferencing. Apollo telemedicine network foundation, Narayana Hrudayalaya, Fortis hospitals are few examples for private institutions to step into telemedicine in beginning days. A decade ago, the concept of telemedicine business model was not in picture, but in later days the first and the only model available was tele-radiology solution called Teleradsol which was started in Bangalore by a American radiologist who was certified to give consultations offline to those small hospitals all over India which had a business deal with the company, and this became a huge business. Narayana Hrudayalaya and Apollo hospitals followed this business model and started tele-radiology services of their own. This tele-consultation, tele-follow ups by corporate hospitals for their clients started becoming successful. In India, health is a state subject, and in each state, telemedicine is practiced in its own way. With all the success stories, government started planning to reach out rural areas where major part of our population are concentrated. The major challenge to connect to villages was non-availability of required bandwidth in rural areas. This limitation to an extent was overcome in 2012-13 by Bharat Broadband which was the arm of telecom company of government of India, who were given the task to provide broadband connections via fiber to rural areas at least to district levels, and at present connectivity's are provided at village levels also. Now, as the internet technologies are upgrading, the access to tele health even at village levels are becoming simple.

Another major driver for telemedicine is policy which is taken care by the government and because of inflexibility in policy, doctors get the excuse that they cannot cohort license or law is not protecting them. Since 2019-20 COVID-19 situation, telemedicine has gone through major leaps of advancement in short span of time and because of COVID-19 government has realized that people cannot survive without telemedicine. On 25th march 2020, the minister of health declared telemedicine practice guidelines, this is an addendum for Medical Council of India. It said that for doctors, along with face-to-face practice, telehealth will also be a part of practice. The major advantage of this policy is that the stakeholders can use various platforms such as zoom, WhatsApp, skype etc.

II. Objectives of the study

1. To understand the concept and evolution of telemedicine.
2. To signify the pervasiveness of telemedicine in urban India.
3. To analyze the current situation and future of telemedicine in India.
4. To identify strengths, weakness, opportunities and threats of telemedicine in healthcare sector in India.

III. Research methodology

This research paper is based on online resources available depicting the significance of telemedicine in healthcare sector. In this research process, an attempt is made to collate the perspective of telemedicine, its history, development and importance in India. So, selected review of the research papers, articles and books related to telemedicine in healthcare sector in India is undertaken that resulted in various propositions.

IV. Literature review

As telemedicine becomes even more widespread, the healthcare field is gaining more evidence has far reaching benefits, and this in turn is providing ample opportunities for researchers. The aim of this study is to represent the glimpse of the research so far that has been done in the field of telemedicine.

G.K Karanth (2005), this study is qualitative in nature and it throws light on evolution of telemedicine in India, projects undertaken by GOI, various aspects and questions that are to be addressed by telemedicine. **Saroj Kanta Mishra (2012),** this study speaks about electronic medical records and hospital automation in the first part, initiatives taken by state and central government, various applications of telemedicine, policies and related projects. **RK Chandwani, YK Dwivedi (2015),** the aim of this paper is to present the scope of telemedicine, current state of telemedicine in India, challenges in its diffusion and suggest the way forward for implementation of such initiatives. **Rajesh V Acharya and Jasuma J Rai (2016)** The aim of this study is to evaluate the effects of telemedicine on patients and medical specialists. From this cross-sectional study, it can be concluded that telemedicine can prove to be useful to patients in distant regions and to rural doctors in India. It says that, telemedicine can be considered as an alternate to face to face patient care in near future. **Pankaj Mathur (2017),** in this study, it is found that telemedicine as a healthcare delivery system has been effectively used in several underserved areas of India, through the initiatives taken by the central, state governments and private sector. From this paper it can be concluded

that though telemedicine cannot be an overall substitute for traditional healthcare system, telemedicine can be used to overcome healthcare disparities in the underserved areas.

S. Syed Thouheed Ahmed (2018), this study says that**,** Information and communication technology (ICT) play a vital role in development of telemedicine in India. Here, the major challenges in scenario and implementation of telemedicine in India are analyzed, observed and reviewed in detail. Hinderances in storage system, need for economic infrastructure design and optimal utilization of resources in India are also tracked in this article. **Vidushi Mahajan (2019)** revealed success stories of telemedicine projects in India, regarding strength, weakness, opportunities and threats. The study indicates that despite the challenges and risks involved in telemedicine, the demands of the healthcare industry in the near future can be met by implementing effective and innovative telemedicine solutions. Updating the technology, the reasons for hesitancy in acceptance of telemedicine practices by both physicians and the public are the major factors to be dealt with. It says that with further research and intensification in government initiatives, telemedicine practices are sure to pave way for a better future in healthcare. **Karthikeyan Iyengara (2020),** The aim of this study is to highlight the learning opportunities offered by the current pandemic and their implication for a better future health care system. This study reveals that virtual and remote technologies have been increasingly used in health care management. **Amertha Gosh (2020),** face to face consultations in this COVID 19 pandemic is arduous. The researchers here have sought to study the feasibility of telemedicine in this scenario. The focus is on the evidence and general guidelines regarding role of telemedicine in patients with diabetes along with its utility and limitations. From this study it can be concluded that telemedicine is a useful tool for managing patients of diabetes during this lockdown period. However, there is limited data and further research is required.

V. SWOT ANALYSIS

STRENGTH

The strengths of telemedicine are as follows:

- It has improved access to healthcare by overcoming the barriers of distance, which in turn has led to cut down in patient time and money.
- Also, patients in remote areas can reap the benefits by getting access to specialists quickly and more conveniently.
- More rapid diagnosis and in time treatment has become possible due to telemedicine
- It has become possible for exchange of knowledge among medical practitioners which keeps them updated and informed.
- Remote analysis, monitoring services and data storage has significantly reduced healthcare service cost.

WEAKNESS

The weakness of telemedicine are as follows:

- The poorer section people are unaffordable to the high cost of telemedicine systems and solutions.
- Patients do not appeal to healthcare services via telemedicine due to lack of awareness and reduced acceptability.
- Also, many medical practitioners are still showing resistance to change and the acceptance rate is slow as they are not fully convinced and familiar with the cumbersome telemedicine equipment.
- There might be uncertainty regarding the risk and responsibility in the functioning.
- Support of reimbursement model is quite low.
- There is a breakdown in practitioner-patient relationship due to excessive reliance upon technology.
- Lack of professional calibers and capacity developing programs.
- Other contributing factors include limited availability of required ICT infrastructure for telemedicine (e.g., internet connection, bandwidth for high speed telecommunications, etc.) particularly in rural areas patients' fear and unfamiliarity, financial unavailability, lack of basic amenities like transportation, electricity, telecommunication, literacy rate and diversity in languages, technical constraints, quality doubts and lack of Government Support.

OPPORTUNITIES

- Acceptance levels by patients as well as practitioners for telemedicine as the standard method of healthcare are increasing in recent days
- In recent days, telemedicine services are getting included in reimbursement models such as Pradhan Mantri Jan Arogya Yojana (PMJAY) -Ayushman Bharat which is hoping to create a great future for telemedicine in India.
- Many international collaborations in telemedicine projects with countries who have better knowledge and resources will prove to be effective for improvement of quality of telemedicine services offered.
- Mobile health is one of the recent trends which looks to be promising.
- Telemedicine provides an opportunity for patients to report early warning signs, get answers to their queries, easy follow ups and make sure they are on track.

THREATS

- Reluctance of population to use telemedicine services
- Inadequate infrastructure and resources to sustain them can be considered as serious threats to the general establishment of the telemedicine system.
- There is a lack of patient follow-up in poor countries, making the assessment of the clinical effectiveness of telemedicine services
- Unavailability of internet connections outside large cities.
- Lack of proper medico legal protocols are also said to be keeping the physicians from embracing the telemedicine practice.
- There are no proper regulatory bodies that could issue the required laws to manage telemedicine services across the country and beyond the country's borders.
- Restructuring IT staff responsibilities and purchasing equipment takes time and costs money hence lack of training of physicians, practice managers, and other medical staff will decrease the effectiveness of telemedicine program.

VI. Discussion and recommendation

As rural penetration of internet is one of the major challenges, funding should be provided by the government to develop rural tele health models as health is a sensitive subject. Most of the broadband/internet service providers do not concentrate much on rural areas as they do not find much of the business in these areas, as high investments are needed for setting up infrastructure whereas. returns are less. But, now a days, demand for technology for accessing information, health and education are rising in rural areas which is creating new markets for the companies. Hence, mobile broadband is having a lot of scope in propelling telemedicine in rural areas.

India has only 0.8 physicians for 1000 people compared to WHO's recommendation of one per thousand. Telemedicine technology has the potential to bridge this gap and provide healthcare to all. According to McKinney report, telemedicine can help replace about fifty percent of the outpatient consultation in our country reducing the burden of overcrowded hospitals and healthcare centers. Adding to this, current COVID-19 situation has evidenced a huge surge in demand from both demand side and supply side of telemedicine, it has led to a dramatic change in patient side as well as supply side and demand for telemedicine grew 8 to 10 times. Training doctors and getting patients accustomed to dealing with doctors is the biggest challenge because trust factor is crucial as far as the healthcare business is concerned. Since India is a multilingual country, language barriers are also very important and many of the telemedicine companies are trying to overcome this barrier.

Currently it is so much likely in India that the doctors have to memorize the prescriptions that they have to make, but in future days we can expect artificial intelligence (AI) and machine learning (ML) to augment doctor's ability to prescribe medicines in a much shorter time frame and at a much higher accuracy.

Another drawback of telemedicine is that it demands patients to own some of the equipments such as pulse oximeter, glucometer and blood pressure testing kit which many of them will not be able to afford or some might not be willing to buy and this situation majorly occurs in rural areas. For this the telemedicine companies have to look into what measures they can take so that these parameters can be collected only after which teleconsultation chain be completed.

Also, we can see that though telemedicine guidelines are clear, there are still many challenges like who will certify the devices, who will dispense medicines, signature of the pathologist on the report as to whether it can be done remotely and many such things are to be made clear by the government.

In the current COVID-19 situation, Indian government has setup call centers for medical health purpose to serve people just like any other services for example like railways. It would be more beneficial if such service continues in a longer run that is even after COVID-19 situation eases out.

Along with all the advancement in technology, even the financial status, willingness to buy any service and capability of paying for it have all improved. Also, it can be said that mobile phone or the smart phone which is the only gadget required for establishing the connection between stake holders are at the reach of almost all of them. Now a days transmitting information has no barriers. We can easily take pictures, make videos, share it with practitioners and all these technologies are provided free of cost by the service providers.

Finally it can be said that while the urban challenges are mostly met, we have to still face rural challenges as it is seen that 70 percent of the population live there. The wellness centers can really address such challenges and more momentum has to be built on these wellness centers and emphasis has to be given on bridging the access deficit in rural India.

VII. Conclusion

Telemedicine has a long way to go in developing country like India. Recently, telemedicine is strengthening its roots in urban, metro and smart city human habitats. Contrary to this, India and its people live in villages who do not have the ability to expose themselves to modern technologies and health availabilities. Government policy to protect the interest of all sake holders in the arena of telemedicine is the need of the hour.

Bibliography

Saroj Kanta Mishra, Lily Kapoor, and Indra Pratap Singh Telemedicine in India: Current Scenario and the Future, 2009, Published Online https://doi.org/10.1089/tmj.2009.0059

G. Brindha, 2020, Emerging Trends of Telemedicine in India, supplementary article Indian Journal of Science and Technology

Rajesh K. Chandwani, Yogesh K. Dwivedi Telemedicine in India: current state, challenges and opportunities

Vinoth G. Chellaiyan,1 A. Y. Nirupama, and Neha Taneja, 2019, Telemedicine in India: Where do we stand? J Family Med Prim Care.

S. Syed Thouheed Ahmed, M. Sandhya S. Shankar, 2019, ICT's Role in Building and Understanding Indian Telemedicine Environment: A Study, Conference paper.