



## A STUDY ON TELEMEDICINE AND ITS IMPORTANCE DURING DISASTER MANAGEMENT IN NORTH EASTERN REGION

**Abhishek Chaturvedi\***

Student, MBA in Hospital Management, Annamalai University, Chidambaram, Tamilnadu, India \*Corresponding Author

**Junior Sundresh**

Associate Professor of Surgery, Raja Muthiah Medical College, Annamalai University, Chidambaram, Tamilnadu, India

### ABSTRACT

During disaster at any remote location there is always an overall lack of resources to cater to increased demand for healthcare services. But if a team consisting of healthcare provider at remote location could consult experts in another region, without having to travel physically, effects of disaster can be minimised by saving life and limbs. Telemedicine can play a vital role in relief operations. Telemedicine describes the use of medical information exchanged from one site to another via electronic communications to improve patients' health status and care. Specialists can successfully provide remote triage and treatment consultation to victims in landlocked areas during disaster management through teleradiology and telemedicine. Appropriate new telemedicine applications can improve future disaster management outcomes, based on lessons learned from civilian and military disaster telemedicine deployments. Emergency care providers must begin to plan effectively to utilize disaster specific telemedicine applications to improve future outcomes. The aim of this study was to identify telemedicine applications in disaster in remote location of North East Region during disasters situations. The literature was searched for using of telemedicine in disaster and remote places with the help of libraries, conference proceedings, data bank, and also search engines available at Google.

### KEYWORDS :

#### INTRODUCTION

In recent years, with the increase in disasters, planning and hospital preparation considered an important part of policies and strategic objectives of health care in each country. Today, efforts to improve disaster management appear necessary. It is estimated that in the past two decades Millions of deaths have occurred in accidents and natural disasters. Of all the problems experienced during disaster events, one of the most serious is communication. Specifically, the lack of appropriate means to efficiently collect process and transmit important information in the midst of a disaster. If accurate and timely information can be made available, needless morbidity and mortality might be prevented. Thus, establishing rapid and reliable telecommunications systems specifically directed toward the disaster medical field is one of the most important challenges. Telemedicine describes the use of medical information exchanged from one site to another via electronic communications to improve patients' health status and care. Using new technologies to organize events and manage disaster can be very useful by using the telemedicine management rules. Crisis management in disaster should reduce the harmful effects of accidents, deaths and damage by using a planned program of preparation and mobilization. Use of the telemedicine in disaster management is the main issue to save lives of accident victims. Because of the devastation created in the health services, medical infrastructure has become an important point. Due to continuous improvement in electronic technology and communication and also existence and utilization of the e-health technology it has become possible to deliver health services in remote areas.

#### AIM

Overview of telemedicine, its role in disaster management at remote location, shortcomings and its remedies are discussed and future technological options are highlighted through literature review and case studies.

#### METHODOLOGY

This study is theoretical review, in which the literature was on the use of telemedicine in disaster and remote areas. A sub-systematic method, which was divided into three phases: Literature collection, assessing, and selection. The literature search was conducted with the help of library search engines available at Google. Since the use of telemedicine is quite recent in India, I did not limit my search to any publish date.

The search was performed in early September and repeated during October 2017 to ensure that my literature review is most up to date and comprehensive. In my searches, I employed the following keyword and their combinations: Telemedicine, remote place, earthquake, war, and telecommunications, in the searching areas of title, keyword or abstract.

#### ADVANTAGES OF TELEMEDICINE

- (a) Many patients feel uncomfortable to go to hospital or doctor-chamber. This system creates communication among patients & healthcare professionals maintaining convenience & commitment. Telemedicine medical information and images are kept confidential and safely transferred from one place to another. So, people can believe this system and feel comfort to seek help from it.
- (b) It saves lives in the emergency situations, while there is no time to take the patient at a hospital.
- (c) In many rural communities or remote places or post-disaster situations, consistent healthcare is unavailable.
- (d) Telemedicine can be applied in such places or situations to provide emergency healthcare.
- (e) This system is useful for the patients residing in inaccessible areas or isolated regions. Patients can receive clinical healthcare from their home without arduous travel to the hospital.
- (f) Modern innovations of information technology such as, mobile collaboration has enabled easy information sharing and discussion about critical medical cases among healthcare professionals from multiple locations.
- (g) Telemedicine has facilitated patient monitoring through computer or tablet or phone technology that has reduced outpatient visits. Now doctors can verify prescription or supervise drug oversight. Furthermore, the home-bound patients can seek medical-help without moving to clinic through ambulance. Thus, cost of health care has been reduced.
- (h) This system also facilitates health education, as the primary level healthcare professionals can observe the working procedure of healthcare-experts in their respective fields and the experts can supervise the works of the beginner.
- (i) Telemedicine eliminates the possibility of transmitting infectious diseases between patients and healthcare professionals.

#### DISADVANTAGES OF TELEMEDICINE

- (a) The overall cost of telecommunication system, especially data management apparatus and practical training of medical professionals is great.
- (b) Virtual clinical treatment decreases human interaction among the healthcare professionals and patients that increases the risk of error in clinical services, if the service is delivered by inexperienced professional.
- (c) Telemedicine might take longer time for the difficulties in connecting virtual communication due to low internet speed or server problem. Moreover, this system cannot provide immediate treatment, such as, antibiotics.
- (d) Low quality of health informatics records, like, X-ray or other images, clinical progress reports, etc. run the risk of faulty clinical treatment.
- (e) Telemedicine system requires tough legal regulation to prevent unauthorized and illegal service providers in this sector.
- (f) Confidential medical information can be leaked through faulty electronic system.

### CHALLENGES IN TELEMEDICINE

- (a) Perspective of medical practitioners: Doctors are not fully convinced and familiar with Telemedicine.
- (b) Patients' fear and unfamiliarity: There is a lack of confidence in patients about the outcome of Telemedicine.
- (c) Financial unavailability: The technology and communication costs being too high, sometimes make Telemedicine financially unfeasible.
- (d) Lack of basic amenities: In India, nearly 40% of population lives below the poverty level. Basic amenities like transportation, electricity, telecommunication, safe drinking water, primary health services, etc. are missing. No technological advancement can change anything when a person has nothing to change.
- (e) Literacy rate and diversity in languages: Only 65.38% of India's population is literate with only 2% being well-versed in English.
- (f) Technical constraints: Telemedicine supported by various types of software and hardware still needs to mature. For correct diagnosis and pacing of data, we require advanced biological sensors and more bandwidth support.
- (g) Quality aspect: "Quality is the essence" and every one wants it but this can sometimes create problems. In case of healthcare, there is no proper governing body to form guidelines in this respect and motivate the organizations to follow. It is solely left to organizations on how they take it.
- (h) Government Support: The government has limitations and so do private enterprises. Any technology in its primary stage needs care and support. Only the government has the resources and the power to help it survive and grow. There is no such initiative taken by the government to develop it.

### TECHNOLOGICAL BARRIERS

As the services offered by telemedicine evolves, the need to quickly overcome its barriers become greater and greater. Telemedicine is a great tool and can be used in many more settings, but it is being held back by multiple gaps within its foundation. (i) A rapidly deployable, portable, yet rugged system, that can reach into hazard zones and buildings.

- (ii) A self-repairing system that heals itself automatically in the event of loss of portions of infrastructure.
- (iii) A system that supports wireless communications for off-the-shelf systems and devices.
- (iv) A system that supports both high bandwidth (digital video) communications for a small number of devices and low bandwidth communications for many (hundreds to thousands) of devices.
- (v) A system that provides robust (but not necessarily high data rate) Internet communications to access critical off site data.
- (vi) A system that maintains quality of service for transmission of critical information; and a system that provides adequate data security.

### CHALLENGES FOR TELEMEDICINE IN INDIA

- (a) Cost Containment: Cost of providing healthcare to population of India is a huge task and introducing ICT would require extra upfront investment. Hence, there is a need to manage the cost in such a way that overall cost of healthcare goes down.
- (b) Information Exchange: Health information exchange needs to be demanded and driven with proper access and control mechanism in place. Challenge is to motivate and encourage key stakeholders like patient, medical service provider, insurance companies and government to pull as well as push right kind of information from the system.
- (c) Adoption and Resistance: In India and across the globe there is a problem of reluctance on the part of patient as well as doctors in adopting telemedicine. There is a need to bring in the right kind of technology in the right way so patients as well doctors feel comfortable in using them.
- (e) Evaluation: Evaluation of the processes needs to be fair and done by an independent third party observer. There is a need to have benchmark so as to compare against them. These could be taken from best practices from local projects or from global examples such as Sweden, Singapore, etc. An independent body could be created for this purpose which provides rating as well as guidance on how to lay down dependable framework for telemedicine.
- (f) Power Sharing: The entire system of healthcare should be such that it can be driven from both central and state government. Power, responsibility, accountability, rewards and risks must be well defined in advance so as to avoid any conflict of interest.
- (f) Managing Information: All the information that has been collected should be media rich (containing video, image, text, etc.). This information should be properly archived, accessible, retrievable, secure and readable from remote location using different technology platforms.
- (g) Education: Telemedicine is not just about providing healthcare service when someone is unwell, but it should also be used to promote preventive healthcare to improve the standard of living and reduce the cost in the medium to long term. This will also help in improving and enabling higher productivity.

### CONCLUSION

Telemedicine is an innovative system of healthcare provision from long distance utilizing the telecommunication and modern information technologies. Today diverse advanced technologies, including, video telephone, latest telemedicine devices, mobile cooperation technology, diagnostic methods, distributed client or server applications, etc. have upgraded the quality and extent of Telemedicine service. This system has eliminated distance barriers to deliver clinical healthcare.

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