**Telemedicine in Disaster and Humanitarian Relief**

According to World Health Organization (WHO), disaster is defined as an event that has devastating impact including loss of life and property, adverse effect on health in such as a scale that would warrant a huge response from outside affected area. These disasters such as the Haiti earthquake had a devastating effect such as loss of life, major disease outbreaks and adverse effects on infrastructure. Management of disasters is complex, expensive and requires huge resources, preparation and collaboration from various organizations. Telemedicine is a program that enables the healthcare providers that are off-site to have a platform to see patients in remote or in disaster situations. The telemedicine programs focusing on remote areas and disaster situations are built on the concept that it provides patient access to specialty services and care that would not otherwise be available (Chen 2017, p. 20).

**What are key technical considerations for telemedicine in disaster and humanitarian assistance?**

Telemedicine is beyond just technology and setting the facility. Moreover, the scope and location of a disaster can vary and will require a different level of humanitarian response. However, there are several key considerations of telemedicine applicable in all disaster and they include:

**Self-reliance**

Disaster affects transport system, communication as well as public utilities, and thus telemedicine programs should be able to operate without ordinary utilities in place such as power and communications (Latifi, 2011). In other words, the programs should work without devices located in the affected area but the device can come with the responding agencies.

**Limited Telecommunication**

Since communication will be largely destroyed during a disaster and the remaining ones may be heavily overloaded by the disaster victims and responders. Thus, telemedicine programs should be designed in such a way that they will have limited reliance on telecommunication. For instance, an ad hoc communication network should be used to support emergency medical services (Qiantori *et al*., 2012).

**Human resources**

Human resources largely determine the success of telemedicine program. It is thus essential to assess and determine the level of health providers.

**Safety measures**

Implementation of telemedicine services also requires safety measures to ensure that patients’ privacy and confidentiality is maintained by providing adequate training to the patients on how to use the programs.

**How can telemedicine support administrative aspects of disaster and humanitarian assistance settings?**

The same techniques used in the provision of telemedicine during a disaster can also support administrative activities that are crucial to disaster management. Various components of telemedicine such as video and video communication, mapping tools, databases and computing platforms can also be used in medical administration and management functions (Latifi, 2011). These telemedicine systems can be used to improve situational awareness that is crucial in ensuring effective, coordinated disaster response. For instance, communication of information regarding the extent of the disaster, the magnitude of the impact on people, capacities of medical facilities and logistics needed. Information derived from video and data sources can also be analyzed using other emergency tools such as Incident Command Systems (ICS). In addition, clinical telehealth infrastructure can be applied in education systems such as training and remote troubleshooting of technical issues. Techniques used in the provision of telemedicine such as email, social networks and voice call can provide psychosocial support to the victims as well as responders as they enable them to keep in touch with their friends and families.

**What are the strengths and weaknesses in disaster and humanitarian relief telemedicine initiatives?**

There are both strengths and weaknesses to telemedicine programs during disasters and humanitarian reliefs.

**Strengths**

One of the strengths of telemedicine is the provision of access to speciality care during disaster enabling the efficient and effective use of healthcare resources. Telemedicine addresses potential shortages in doctors and connects people affected by a disaster with specialists who may not be able to physically reach the victims in the wake of a disaster. People affected by a disaster are able to see doctors remotely. Doctors can set u a station with a computer monitor and designed equipment to measure vital signs so they can see patients remotely. For example, teleconsultations can be provided to victims during a disaster. It is also cost-effective since it will reduce travel expenses and the resources can be used to handle other disaster-related issues.

Telemedicine can also be used in disaster response to improve the capacity of the medical system and ensure a faster medical response.  Since it relies on a virtual platform, it enhances communication and increases situational awareness within the incident management system. In fact, research shows that the use of telemedicine in managing disaster victims can enhance the harmonization of the resources between the peripheral treatment and the receiving centre which may lead to overall better health outcomes.

It also saves lives in disaster situations. During emergency situations, there no time to take victims to the hospital and in some cases the transport systems may also be affected. Thus, telemedicine can be applied to such situations to provide emergency healthcare. Text, pictures and video can be sent to those injured without having them leave home in the middle of a disaster. In post-disaster situation, mobile health emergency coordination center helps in promoting collaboration with public health services (Chronaki et al., 2007).

It reduces the cost of providing healthcare. As more specialists are accessed through telemedicine, the victims are less likely to be hospitalized, thus improving efficiency of bed usage (Xiong *et al*., 2012). The aftermath of a disaster can last years after the event. This can be a huge burden to the healthcare system. Telemedicine can provide the needed support to local providers over a long period. Given that telemedicine relies on virtual resources, the cost to provide care can be considerably less than bringing a team of doctors to the affected areas.

**Weaknesses**

Although telemedicine provides numerous benefits in advancing humanitarian response, there are areas of concern. One of its weaknesses of telemedicine is the risk of confidentiality posed by data intruders which may be leaked through a faulty electronic system.

With the advancement in telemedicine, there will be more clinical tasks that will be entrusted to the ancillary health workers. It is difficult to determine whether the physicians' obligations extend beyond clear and timely communication. It is also debatable whether humanitarian work exempt physician from the legal responsibility for the patient and how malpractices should be addressed if an error occurs during transmission and execution of specialists' recommendations.

In addition, the quality of information shared electronically may be hindered by patients' limited literacy, and thus may affect overall treatment outcome. Also, during a disaster, there may be the limitation of video conferencing equipment, and thus thorough physical exams could not be completed.  It may also take a longer time to provide care due to difficulties in connecting virtual low internet.

Disaster and humanitarian relief telemedicine initiatives can lead to a conflict if the issues such as limited resources and a shortage of physician are not addressed.  In some cases, telemedicine cannot completely replace physician visits; rather, they need to be considered as an addition to the current system.

In conclusion, disaster and humanitarian relief can benefit by utilization of telemedicine to improve health care delivery and overcome geographical distance, limited infrastructure and urgency in the wake of disaster. However, it has technical and legal challenges that need to be addressed.

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