



Telemedicine in Selected Military Medical Centers: What and How It Is Being Done

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Abstract

Background: Telemedicine is considered a remote diagnosis and treatment of patients using telecommunication.

Objectives: This study aimed to share the experience of using telemedicine in selected military medical centers.

Methods: Telemedicine includes medical practice and information and communication technology. It has proven to be very effective for telehealth care, especially in areas with poor health facilities. However, the implementation of these technologies is often hampered by various issues. However, due to the spread of military personnel in the vastness of Iran's geography and the need to handle and receive medical care and treatment, telemedicine has been considered for more than a hundred centers since 2019.

Results: Telemedicine provides various types of health care services, such as psychological consultations, educational services, health care delivery and management, disease screening, and disaster management services across selected military medical centers.

Conclusions: Although telemedicine cannot be a solution to all problems, it can certainly go a long way in reducing the burden on the health care system through safe and effective communication.

Keywords: Applications of Telemedicine, History of Telemedicine, Telemedicine in Iran, Telemedicine in Public Health, Types of Telemedicine

1. Background

The scientific history of telemedicine dates back to ancient Greece, providing a comprehensive historical perspective of telemedicine to the present day, which has led to more than a century of innovation in technology and telemedicine care (1,2).

The World Health Organization (WHO) defines telemedicine as:

The delivery of health care services, where distance is a critical factor, by all health care 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 health care providers, all in the interests of advancing the health of individuals and their communities (3).

Telemedicine is a remote diagnosis and treatment of patients through telecommunication technology (4, 5).

Telemedicine is rapidly being integrated into health care as a way to increase patient access, particularly across the urban-rural divide (6).

Modern telemedicine applications originated in Europe by a Dutch physician, Willem Einthoven, with the remote transmission of electrocardiograms in 1905. In the 1860s, during the Civil War, the telegraph was used to relay messages from wounded soldiers to medical teams (1).

Following those developments, radio consultations were carried out for patients who were on ships at sea and on remote islands from medical centers in Norway, Italy, and France in the 1920s, 1930s, and 1940s. In the early 1950s, the transmission of radiographic images began in the United States, and similar experiments were conducted in Canada shortly thereafter (2). The first wave of organized telemedicine programs in the United States began in the late 1950s (1).

Telemedicine applications and its benefits include remote consultation and diagnosis, specialized clinical care (including examples from anesthesiology, dermatology, cardiology, psychiatry, radiology, critical care, and oncology), and others (including examples from patient education, monitoring at home, and continuing education) (7). As the information transfer time, telemedicine is classified into 5 main types:

(i) Where the sender and receiver are both online at the same point in time and "live" transmission of information occurs as real-time or synchronous telemedicine.

(ii) Where the sender stores and sends databases to the receiver at a suitable time, and the receiver can check the data as remote or asynchronous drug storage and supply.

(iii) The remote monitoring type of telemedicine (ie, self-monitoring) uses a range of technological devices to remotely monitor a patient's health and clinical symptoms.

(iv) Health professional care, referral, and counseling services.

(v) Health professional to the patient (8).

Computing and information technologies, network infrastructures, and telecommunications are the main drivers of technological innovation. Also, the goals of technology initiatives that have helped the development of telemedicine include expanding access to health services and treatment, providing health care for travelers, military programs, remote home care, reducing costs, developing tools and health policies and strategies (9).

Accordingly, the importance of rapid medical services in accidents and war is the first level of activities. The purpose of developing and using telemedicine is to improve medical care for all defense sectors, especially the frontline medical forces.

2. Objectives

This article refers to the measures taken regarding the use of this technology with the aim of sharing the experience of using telemedicine in selected military medical centers.

3. Methods

Telemedicine systems are being implemented for selected military medical centers in different geographical areas of Iran, especially in border and remote areas with more than 100 points defined. On the other hand, for optimal management in the exchange of medical information and timely action to control and resolve existing problems and challenges, according to the

territorial analysis, these cases have been divided between military hospitals. In the hospitals, a work plan has been developed for doctors and nurses for the continuous activation of the system to respond to calls. On the other hand, the users of these systems have the duty to respond to the calls of the monitored hospital around the clock, or if there is an emergency, they must immediately inform the selected hospital through the systems.

4. Results

Numerous psychological consultations are held daily through the communication of telemedicine users at border points with psychologists and specialists in this field. Also, in terms of health and decontamination requirements in those areas, health experts contact the users, corrections are made, and the report will be sent through that. Medical consultations are also provided by specialist doctors in cases where trauma does not occur.

Also, if there is a need to transfer the patient, the relevant consultation is done for the safe transfer of the patient.

5. Discussion

The implementation of remote medicine represents a significant shift in the military health system. The use of telemedicine in natural disasters and wars, health development, hard-to-reach areas, control of chronic diseases among military forces, air flights, and sea travel in wars, besides diagnosis, treatment, control, follow-up, training, and counseling, as well as most importantly for storing medical information resources (including all kinds of information banks and medical databases) are in military organizations (10).

Choi et al. described the effectiveness of telemedicine in adequately controlling active duty US Army soldiers with type 1 diabetes via telemedicine (11). Alphonso et al. demonstrated that in the United States, telemedicine (or the practice of medicine using remote technology applications) is increasingly integrated into established health care settings due to its ease of use and wide application. Deployed health care providers receive online teleconsultation on diagnosis and treatment plans with expert consultants in the USA (12). According to the study by Salehahmadi and Hajialisghari, telemedicine has the advantage of bridging regional differences where the same information can be accessed from the next room and from a medical facility thousands of kilometers away. In this way, the quality of medical care is greatly improved because access to specific medical care can be extended to rural areas (13).

Furthermore, according to Horn et al., providing telemedicine for Native American populations, in addition to obvious benefits such as increasing access to health care and reducing health disparities, was estimated to be less expensive than equivalent care provided by travel (14). Also, according to Kruse et al., the use of telemedicine in rural areas of American communities is a viable option to reduce costs, increase quality, and increase access to health care, even in remote locations (15).

5.1. Conclusions

The role of telemedicine in education, health care, disaster management, providing psychological counseling, and screening is promising. Advances in technology allow more visualization capabilities (such as 3D remote viewing and virtual presence) to digitally access practice areas and provide training. Selected military medical centers benefit in terms of patient care and medical education, whereby low-cost health care and standardized training can be provided. We propose here to integrate telemedicine into the framework of regular medical education programs.

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Footnotes

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