

Local Experience of Telemedicine: Examples of Cases in Yemen

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Abstract

Background: The benefits of telemedicine services are very important to society to improve the quality and accessibility of health in the healthcare delivery system and method of medical education and exchanges knowledge and experiences. However, the number of service provision sites is limited, and it cannot be accessed, and the service is not used by the majority of the community due to inadequate information and sub-standard communication facilities and under-evolution of the importance of by both public and medical profession and other various factors in Yemen. The health sector in Yemen has grown significantly through the increase in the number of hospitals, health units, health centers, family and medical staff. Despite the country's orientation towards developing and improving the health sector, Yemen is still among the countries that suffer from many health problems especially with regard to quality and distribution of facilities and diseases.

Objective: The aim of this research is to explore one of the first experiences in the use of telemedicine in Yemen by clarifying cases that benefit from telemedicine and exploring the potential for development of network of TM to serve areas which lack sub-specialty services.

Methods: The first stage of experience of TM services in Yemen goes back to 1997. At that time we joined a newly established international company based in the USA with several offices in different countries. We got a huge, expensive digitizer that was supposed to transfer medical reports to second opinion sites in USA, UK Jordan etc. The second stage continued few years later utilizing the free service, namely Swinfen based in UK. In which 300 cases were involved and benefit from TM services in the first and second stages.

Results: The majority of the participants in the cases presented benefited from the correct decision of management and treatment, and few travel arrangements were made for cases requiring travel.

Conclusion and Recommendation: This study revealed that telemedicine services are generally underutilized in Yemen despite good results in our cases. Technical, administrative, and legal issues should be discussed in Yemen. Factors such as technological barriers to internet connectivity and system reliability must also be considered. Knowing and identifying the factors is vital for considering in-depth future studies and taking appropriate measures to fix the problems faced TM in Yemen.

Keywords: Telemedicine TM; Local Experience; Yemen

Introduction

One of the greatest challenges facing humankind in the 21st century is to make high-quality health care available to all. Although the vision of WHO is health for all, its realization is difficult, perhaps impossible, because of the burdens imposed on a growing world population by chronic and acute diseases, rising expectations for health, and socioeconomic conditions of the society that increase disparities in health status between and within countries. Traditional way of achieving equitable access to health care is very difficult because the provider and the recipient must be present in the same place at the same time. The advancement of information and communication technologies created opportunities for overcoming the problems by alternative ways of access-

ing health care services by using telemedicine services [1-4].

Telemedicine is an alternative way of giving health care services which address the health problems especially in developing countries like Yemen because of shortage of health professionals and health care facilities. Telemedicine is the use of information communication technology to deliver health care services from one location to another in different approaches (for example store and forward, real-time and remote monitoring) that has the potential to increase the quality and access to health care and to lower patient costs. Telemedicine involves secure transmission of medical data and information, such as biological/physiological measurements, images, audio, video, or any other type of data needed for prevention, diagnosis, and treatment, follow-up

and monitoring of patients [4-7].

Telemedicine services range from individual patients to healthcare systems as a whole from single mobile consultations up to highest surgical procedures and play an important role in providing solutions for health challenges. For instance, telemedicine maximizes the use of existing health care professionals by allowing them to diagnose from distance, monitor and recommend treatment for patients located in remote areas. Telemedicine service in general is one of the promising services in the health care delivery system to achieve sustainable and equitable healthcare services in developing countries by using information and communication technologies to address some of the societal health challenges [6-8].

TM has been introduced to many countries in Asia, Africa and Latin America. Progress differs from country to country. The general impression is that all countries are expanding the service in spite of the problems related to the gap between international development strategies and local realities [4]. The aim of this research is to explore one of the first experiences in the use of telemedicine in Yemen by clarifying cases that benefit from telemedicine and exploring the potential for development of network of TM to serve areas which lack sub-specialty services.

Methods

The first stage of experience of TM services in Yemen goes back to 1997. At that time we joined a newly established international company based in the USA with several offices in different countries. We got a huge, expensive digitizer that was supposed to transfer medical reports to second opinion sites in USA, UK Jordan around 300 cases benefited over a period of about 4 years. It was essential to sue e-mail and post to transfer cases due to failure to utilize the digitizer. The second stage continued few years later utilizing excellent and highly qualified free service, namely Swinfen based in UK. In which about 200 cases benefited from consultation and the majority were followed for a long time over the progress of the cases. The majority of cases in the first phase were sent to Jordan, few cases to UK and USA. The cases covered all specialties for adults and children (neurology, dermatology, ophthalmology, oncology, nephrology and few cases of laboratory second opinion. The latest ongoing experience started since almost 13 years ago with the excellent free service of the UK based Swinfen charity organization. A secure web-based messaging system is used, which gives referring practitioners from more than 68 countries access to a panel of more than 514 consultants in UK specializing in a wide range of disciplines. The service is, not only a second opinion but due to the excellent response system follow up could be done reaching in some cases over 50 messages. The number of consultations over the period of almost 13 years was about 85 cases. The frequency of interaction with the consultants and the administrators who run the service was in some cases about 122 interactions over the years. Others were with minimum 5- 10 interactions between primary physician in Yemen and consultants in UK.

The benefits were

- Educational to the primary opinion
- Provision of advice which was impossible to get from the sources due the constrains of cost, language barrier and the great difficulty of travel which is impossible in almost all cases.
- Direct benefit to the patient, in the form of drug use, operation details, more specialized opinion in the field of investigations (laboratory results, radiology images).

Results

The educational and service and economic benefits can be illustrated in the following cases

- Of the few of cases where the image of the x-ray was sent to USA is the case of the child who was a victim of a fall from third floor and suffered from several fractures at the elbow. A subspecialist in USA could give an excellent point of view to the local orthopedic surgeon giving details of for the operation. The success of the operation was remarkable
- The artificial hip joint of a patient who was getting the wrong postoperative physio at home was saved when given the proper advice in time.
- Eliminating the huge burden of travel abroad of a patient whose case of brain cancer was inoperable. His travel was stopped.
- A patient who due gunshot which hit the spinal column. The whole spinal column moved forward the local surgeon got a good and urgent advice for the operation.
- A consultation with psychiatrist in USA was very educational and gave more trust in the practice of local doctor and more benefit for the patient. The discussion on drug use and the local herb KATHA gave a chance of both sides to exchange information which was very useful to the patient.
- Management of some cases was followed by feedback system with the treating physician in Jordan and USA.
- Direct benefit to the patient such as the case of supraspinatus tears. Primary opinion was insisting that the patient need laparoscopic repair. The second opinion used the term I do not treat radiology. The advice of physiotherapy was very helpful achieving excellent results.
- Cerebral palsy with recurrent convulsions and multiple deformities, in this case neurologist, plastic surgeon and physiotherapist responded to the primary requests.
- A child with adenoma in the parathyroid gland. Primary opinion of a general surgeon was to operate. The second opinion was very useful excluding the surgical option and commenting the useful medication needed.
- A case of rheumatic heart disease: The artificial mitral valve was damaged because of failure to treat infection; sub-acute bacterial endocarditis caused also neurologi-

cal problems viz micro aneurysms developed, which was shown after the valve was replaced. The case developed coma and partial loss of vision. Follow up was done simultaneously between what primary treating doctor is doing and second opinion in London and via another system an opinion was taken from center in Turkey as well.

- The advice by a neurosurgeon in a case of severe trauma to the leg was very useful to the surgeon.

Discussion

The current study has focused on patients and clinicians who have had experience with TM consultations. This purposes are similar to most previous studies that focused on patients or clinicians who have had experience with TM consultations [8, 9]. The results indicated in the cases mentioned in the current research that the participants realized that they were the recipients of services and that their role as a patient is to accept the advice and services provided to them, and this led to the elimination of the inconvenience or the burden associated with travel and the cost of treatment outside Yemen. This finding is similar to that reported in rural settings in developed countries where the inconvenience and burden associated with travel and the cost of treatment outside their areas are eliminated by TM [10, 11].

Telemedicine services can be viewed as patient-centered, as a means of providing the quality and level of care expected from specialized services, in a location that is practical for the patient. One could argue that telemedicine services would be commonplace in a healthcare system that is truly patient-centered. However, telemedicine is not the only example for poor countries such as Yemen that are late, but rather a method prevalent in developed countries, especially at this time when the Corona epidemic spread, which prevented people from moving easily [4,11].

For patients to be able to ask for specialist services by TM, they need to know about TM and understand the possibilities - and also the limitations - of receiving services through this modality. Additionally, for patients to be able to receive TM services, their primary care provider needs to know how to access and refer to such a service [11, 12]. Participants agreed the main benefits of TM would be the reduced need for travel and they did not appear to be concerned about the limitations of TM or privacy concerns that are reported in the literature [8-10].

Participants hinted at some of the barriers mentioned in the literature [11, 12], such as unwillingness to change, but from our experience in this study, the lack of community awareness of the availability of telemedicine may be another important obstacle in Yemen. National network together with national database facilities is the end goal of TM in Yemen as it exists now in many developed and developing countries. Such a facility is needed in all developing countries for the sake of control and prevention of communicable disease and for educational purposes. It is widely accepted by these residents that living in areas with poor health services will require telemedicine. However, the ability of TM services to

provide many high-quality services challenges the validity of this acceptance.

To come to the point: telemedicine can be beneficial to patients in isolated communities and remote regions, who can receive care from doctors or specialists far away without the patient having to travel to visit them [13]. Recent developments in mobile collaboration technology can allow health-care professionals in multiple locations to share information and discuss patient issues as if they were in the same place [14]. Remote patient monitoring through mobile technology can reduce the need for outpatient visits and enable remote prescription verification and drug administration oversight, potentially significantly reducing the overall cost of medical care [15]. It may also be preferable for patients with limited mobility, for example, patients with Parkinson's disease [16]. Telemedicine can also facilitate medical education by allowing workers to observe experts in their fields and share best practices more easily [17]. Telemedicine also can eliminate the possible transmission of infectious diseases or parasites between patients and medical staff. This is particularly an issue where MRSA and other hospital acquired infections are concerns. Additionally, some patients who feel uncomfortable in a doctor's office may do better remotely. For example, white coat syndrome may be avoided. Patients who are home-bound and would otherwise require an ambulance to move them to a clinic are also a consideration [14, 17].

Conclusion

This paper attempts to search for solutions to improve the quality of health care services in Yemen through TM technology and to spread awareness among health workers and the community of the importance of this type of medicine. There are various reforms underway to improve Yemen's current healthcare indicators. The ICT infrastructure needs a strategic assessment in Yemen for the successful implementation of telemedicine services. We recommend the development of information and communication technology in Yemen to meet the needs of telemedicine. As well as establishing units in hospitals to carry out telemedicine care.

Conflict of Interest

"No conflict of interest associated with this work".

Author's Contribution

The first author presented the data and the first; second and the third authors analyzed the data and wrote, revised and edited the paper.

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