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Original Article

Role of Telemedicine in Tele-Ward Rounds

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Abstract

Background: Wide coverage of internet and telephonic access have the power to provide physicians with access to an abundance of electronic medical information. This information is available in a variety of forms that may be used to support clinical decision making. Mobile phone applications like Skype Whats App and telephonic conversations are widely used as means of communication in the medical community. This is inexpensive when compared to two-way, fully interactive, real-time, video telemedicine. *Methods*: The study is an observational retrospective study conducted in the Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education & Research (Jipmer), Pondicherry from March 2015 to April 2016. The tele-ward rounds consisted of WhatsApp messages and telephonic conversations between the consultant and the residents. At the end of the study period, the feedback was obtained from consultants, residents and analyzed. *Results*: The consultants and residents found the tele-ward rounds to be a user-friendly and cost-effective method to obtain support from consultants in less time-critical contexts. *Conclusion*: Tele-rounds is found to be a promising method of communication, especially in nonemergency situations where there is a limited number of consultants or the respective consultant is on leave. It is User-friendly and cost-effective means to obtain decision support from consultants in less time-critical contexts.

Keywords: Telemedicine; Tele-Ward Rounds.

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Introduction

Telemedicine may be broadly defined as "the use of telecommunication technologies to provide medical information and services" [1]. For example, the National Library of Medicine holds a broad conceptual view of telemedicine which includes three essential elements: (1) clinical decision support; (2) physiologic or image signal processing; and (3) legal or credentialing arrangements between institutions which enhance remote medical practice [2].

Telemedicine involving two-way, real-time video and sound consultation provides support for clinical decision making in extremely time-critical contexts. The instrumentation for telemedicine can be complex and expensive or may be served by less expensive and more widely available modes of telemedicine [3]. The use of the internet, mobile data and telephone to support clinical decision making is an example of telemedicine.

Methods

This study is an observational retrospective study conducted in the Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER), Pondicherry from March 2015 to April 2016. The tele-ward rounds consisted of using mobile phone applications like

WhatsApp messages, Skype calling and telephonic conversations between the consultant and the residents. Daily ward rounds were taken by the resident and photographed the images of each patient, progress record, doctor's orders and relevant investigations for that day. These images are sent to the consultant using WhatsApp. Any other details regarding the patient and decision making were discussed by telephonic conversations and Skype call.

For each patient, daily four photographs were taken, one patient's clinical photograph, progress record, doctor's orders and relevant investigations for that day. So on an average around 40 images were sent through WhatsApp application to the consultant by residents each day. Skype calling was used when there is any difficulty in diagnosis by the resident and needs consultant's expert opinion. All the images were viewed and monitored by the consultants in their mobile or tablet. At the end of the study period, the feedback was taken from consultants, residents and analyzed.

Results

The feedback was taken from consultants and residents. They found the tele-ward rounds to be a user-friendly and cost-effective means to obtain decision support from consultants in less time-critical contexts.

Fig. 1: Telephonic conversation between resident and consultant

Fig. 2: Photographic imaging of the patient

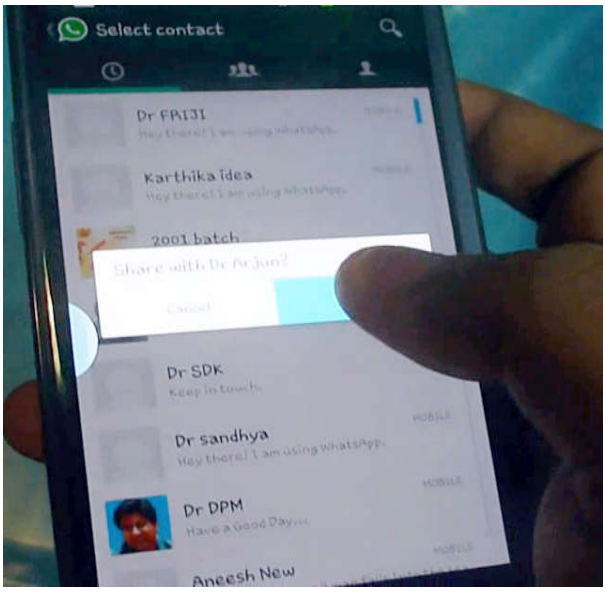

Fig. 3: Sending Patient information by WhatsApp

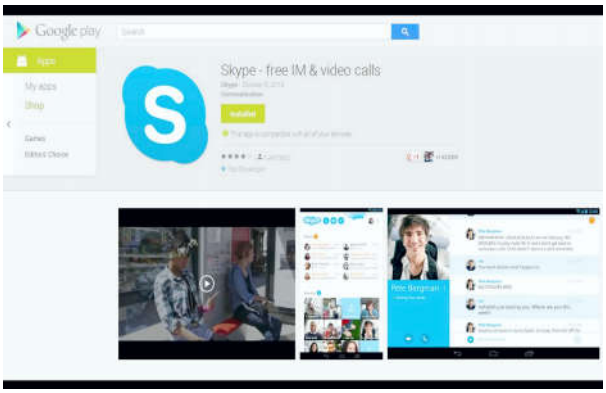

Fig. 4: Skype application

Fig. 5: Skype video calling from tablet.

Discussion

Since the first documented use of telemedicine at the University of Nebraska College of Medicine in

1959 [4], telemedicine has been growing progressively. The earliest citation of telemedicine in a developing country dates back to 1986 [5]. Owing to limited infrastructural capacities, developing countries primarily bank on store and forward concept of telemedicine. However, some telemedicine programs in developing countries with broadband connectivity have enabled telemedicine linkages quite comparable to those in the developed world [6]. In a very simple form, they are reaping the benefits of telemedicine by exchanging clinical information and comments through emails, web based applications and Plain Old Telephone System (POTS) [7].

Types of TM [8]

1. Store and forward (SAF) or pre-recorded (asynchronous) TM
2. Real-time or video conference (VC) (synchronous) TM
3. Hybrid TM
4. Mobile or cellular TM
5. Integration model.

Asynchronous TM

In this, information about the patient is acquired and stored in some format before being sent by some appropriate means for expert interpretation. It involves the transmission of digital images, and asynchronous evaluation is practiced. The simultaneous presence of the health care professional is not required. It is the commonly used technology. SAF TM has been found to be cheap and easy to set up and practice.

Synchronous TM

There is no appreciable delay between the information being collected, transmitted and displayed. Interactive communication about wound care between individuals at the site is, therefore, possible. Real-time interaction requires an expert to be available to give an opinion. Real-time or video consultation (VC) uses video conferencing equipment to connect the patient, often with their General Practitioner (GP) or nurse present, with a distant consultant.

Hybrid TM

The combination of SAF TM in the first step followed by VC TM in the second step is called hybrid TM. It saves time, clarifies doubts and avoids misinterpretation from both the ends. This process achieves the best physician and patient satisfaction as far as patient care is concerned.

Cellular TM

Portable devices like cellular phones and Personal Digital Assistants (PDAs) (like laptops and handheld computers) provide an inbuilt camera to capture patient's digital images, and computing and networking features to deliver patient care at a distance. They provide immediate image access and direct interaction, and it is possible to obtain clarification. Quality and speed of image transmission is no longer an obstacle. New generation cellular phones allow taking good-quality images and transmitting them directly to other cellular phones (via multimedia messages) and computers (via e-mail or blue tooth-wireless connection) with diagnosis agreement of 82% compared to face-to-face consultation.

Integration Model

The systematic functional integration of electronic devices and software to capture, transfer, store, measure and deliver patient follow-up care is the principle of integration model and has been used effectively for patient care in remote geographical regions. Routine follow-up care in a remote area under the close supervision of higher center is performed. Computerized measurements are rapid, easy and precise, and suited for SAF TD.

Conclusion

Tele-monitoring of ward patients is found to be user-friendly, cost-effective means to obtain decision support from consultants in less time-critical contexts with frequent interaction possible between consultant and resident. Because of the wide availability of Wifi, broadband internet services, and mobile internet the clinical decision making regarding patient care is easy for the consultant and residents.

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