

Role of cost-effective indigenous mobile telemedicine kiosk for tele consultations during COVID-19

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Abstract

The COVID19 is spreading rapidly and one of the most important steps in minimizing the spread of infection is social distancing. Telemedicine can play a vital role in enabling social distancing in healthcare. The Telemedicine consultation needs a telemedicine kiosk. The commercially available kiosk is very costly, in this article we are sharing our experience of making a telemedicine kiosk using the materials available in our department and ward.

Keywords: COVID 19, Telemedicine, Telemedicine kiosk.

Introduction

COVID 19 appeared first in china during December 2019, which went on to become a pandemic affecting various countries. The healthcare workers are among the high-risk category of getting infected with the COVID19. The healthcare workers once get infected carries the risk of spreading the disease further to other patients, bystanders, as well as other healthcare workers. This leads to the mortality of patients as well as healthcare workers. One of the preventive measures advised is social distancing.

The term 'Telemedicine' was coined way back in 1970. Literary, telemedicine means 'healing at a distance'¹ as it bridges the gap between doctors and patients by using information technology. Telemedicine kiosks can be used for any consultation between doctors and patients admitted in the ward, ICU, or the emergency also. Commercially available telemedicine kiosk is very costly and may not be available in hospitals in developing countries. Even though low-cost telemedicine applications are possible, these applications are not being adopted in low-income countries on a significant scale due to a variety of barriers.^{2,3}

This article shares the experience of using an indigenously made mobile telemedicine kiosk for teleconsultation between doctors and admitted patients in our ward during COVID 19.

Materials and Methods

This study was conducted in the department of plastic surgery in a tertiary care hospital during the COVID-19 period. Informed consent was taken from all patients and

ethical clearance taken from the departmental ethical committee. The Telemedicine kiosk was made without any cost using the material available in the ward.

For making the kiosk (Fig. 1) an unused trolley in the department of plastic surgery was painted and was fixed with an unused IV stand and a flexible endoscope light source cable that was used to mount a Web camera. The trolley was equipped with various healthcare-related digital equipment (which were already available in the ward), like an infra-red digital thermometer, digital BP apparatus, digital stethoscope, digital glucometer, digital weighing machine, digital pulse oximeter, etc. For video conferencing purpose a laptop and digital video camera and Wi-Fi available in the department were used. The resident and nurse donned with appropriate PPE were asked to show the patient of the ward to the consultant online (Fig. 2) and the senior doctor evaluated the patient and necessary orders to be implemented for the patient was given. (Fig. 3) showing the consultations given by the senior doctor. The feedback was taken from the patient and the doctor about the audio, video and the user-friendliness of the technology.



Fig. 1: Telemedicine Kiosk



Fig. 3: Patient in the ward getting Telemedicine consultation

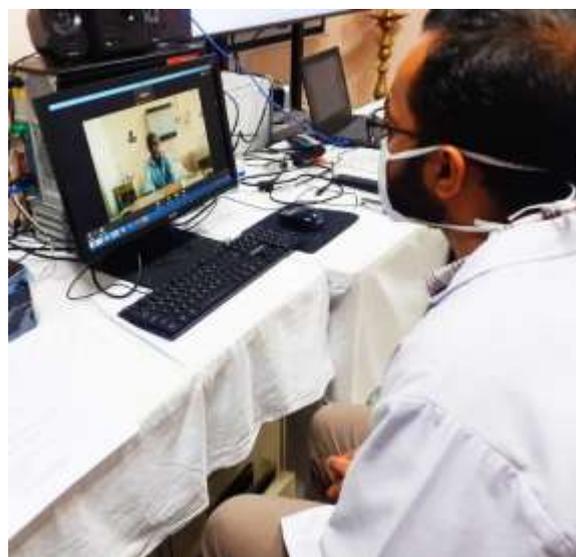


Fig. 3: Doctor giving Telemedicine consultation

Results

Feedback (Table 1) showed that there were good audio and video quality. All the consultations and documents which were shown online were clear and voice was audible. doctors in the ward and nurse could take the consultations clearly and implement accordingly.

Feedback was also taken from the patients about their experience while talking with the consultants online. It was found to be satisfactory. (Table 2) showing the feedback taken from the patients.

During the study period, none of the patients got infected with COVID19, similarly none of the healthcare workers while using this technology got COVID19 disease.

Table 1: Feedback from Doctors/Nurses

Parameters	Excellent	Good	Bad
Audio clarity			
Video clarity			
Network			
Easiness			
Overall			

Table 2: Feedback from patient

Parameters	Yes	No
Was doctor audible		
Was doctor visible		
How was the internet connection		
Was it easy to use Telemedicine		

Discussion

Social distancing is very important in the prevention of the spread of COVID19. Healthcare workers can spread the disease to the patient or the patients can transmit the disease to the healthcare workers if an adequate distance is not maintained. And sometimes the healthcare workers or patients may be in the incubation period, or carrier state and later on they may become positive cases leading to increased mortality.

Telemedicine is defined as the role of information technology tools for communication between patients and doctors. Based on the principle of telemedicine the telemedicine kiosk was prepared in the department and was used for the teleconsultation.

Telemedicine kiosk can be used for; Tele-ward rounds, Tele-ICU rounds, Tele-burns ward rounds, Tele-emergency consultations, Tele-patient-attendant interactions as well as Tele-monitoring. The advantages of using a kiosk than a hand-held mobile camera are that the kiosk camera is more static, voice is more clear and most importantly there is only minimal contact of the equipment with patient or healthcare personal and it can carry all necessary instruments for monitoring the patient like a thermometer, BP apparatus, Glucometer, weighing machine, pulse oximeter, etc. in one place. The disadvantage is it is more cumbersome than a handheld mobile camera.

The literature shows that this kind of practice is already available and being used in developed countries. But in developing countries because of the high cost, it may not be possible to use commercial telemedicine kiosks for teleconsultations. This study highlights the role of indigenous cost-effective mobile telemedicine kiosk used of teleconsultation and was found to be effective. There are many types of telemedicine:

Type of telemedicine application in practice are: ⁴⁻⁷

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

Conclusion

Telemedicine plays a vital role in providing teleconsultations during COVID19. And a mobile

telemedicine kiosk may help in the prevention of the spread of the disease.

Limitation of the Study

Large randomized control is required to substantiate the result of the study.

Disclosure

None.

Conflict of Interest

None.

Financial Support

None.

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