Student Forum

Role of telemedicine in COVID-19 pandemic – An overview

Tanupriya Saxena[1], Ruchi Srivastava[1], Chetan Chandra[1]

[1]Department of Periodontology, Saraswati Dental College, Lucknow, Uttar Pradesh, India.

*Corresponding author:
Dr. Ruchi Srivastava,
Department of Periodontology,
Saraswati Dental College,
Lucknow, Uttar Pradesh, India.

drruchi117@gmail.com

ABSTRACT

COVID-19 pandemic has caused worldwide havoc. The present healthcare system is ruined, distancing both patients and doctors. To avoid transmission of infection, travel restrictions were made, making the patient's visit to the doctor difficult. However, routine checkups for patients not infected with COVID-19 should be given without the threat of getting exposed to other patients in the hospital. In this respect, telemedicine becomes a reliable source that provides health services as well as reduces the infection spread. The first known evidence of real-time (live) video consultation occurred in 1959 at the University of Nebraska where doctors used telemedicine to transmit neurological examinations to students. During the first 3 months of 2020, there was a 50% increase in telehealth visits. Most patients from January to March 2020 approached for a condition other than COVID-19. Many telemedicine applications have been launched for teleconsultation such as Practo, Mfine, TATA Health, and Doctor 24 × 7 provide teleconsultation. Telemedicine has shown a huge impact on the present healthcare system during this pandemic and has placed itself in the spotlight during recent times. Through this paper, the role of telemedicine in the current scenario of pandemics and its development through recent times is discussed.

Keywords: COVID-19 pandemic, Telehealth, Telemedicine

INTRODUCTION

As we all know, COVID-19 has created a worldwide crisis and ruined the present healthcare system. These conditions make situations difficult for the patient to visit the doctors in the hospital. However, routine checkups for the people who are not infected with COVID-19 especially those with compromised immune that may develop the disease (e.g., elderly people and those with underlying disease) should receive their routine checkup without the threat of being exposed to other patients at the hospital. Thus, providing a sustainable solution to fulfill the critical needs of patients with health-care services at their homes only. For this matter, technological advances provide new options. Telemedicine becomes a reliable source where health services are provided as well as decreases the hazard of direct person-to-person exposure. Telehealth is a 21st-century technology that provides both consultations along with protecting patients and physicians.

According to the WHO, telehealth is the delivery of healthcare services, where distance is a critical factor by all healthcare professionals using information and communication technologies for the exchange of valid information for the diagnosis, treatment, and prevention of disease and injuries, research, and evaluation and for continuing education of health-care provider, all in the interest of advancing the health of individuals and their communities.[1] With this

growing development period and decreasing size of portable electronics, most families owe digital devices such as smartphones and webcams through which patients can communicate to a healthcare provider. Other technology such as video conferencing and similar television systems can also be used for providing health-care programs to those who are hospitalized or in quarantine to decrease the risk of exposure to others and employees. Furthermore, these facilities can be given to remote patients by the physician who is in quarantine. Therefore, telemedicine becomes a very important healthcare tool.

HISTORY

The earliest use of telemedicine was first recorded in the first half of the 20th century by transmitting ECG over telephone lines. The first known evidence of real-time (live) video consultation occurred in 1959 at the University of Nebraska where doctors used telemedicine to transmit neurological examinations to students.[2] The first opportunity for private participation in public health management using telemedicine was created by Medical Informatics and Technology Application Consortium, a commercial space center in the year 1997.[3]

A telemedicine setup will require a few basic needs and some choices. It requires (1) secure internet connections (broadband), (2) a video platform, and (3) technology support. The utmost important thing for telemedicine is a secure broadband internet connection. A broadband connection is sufficient at 50–100 Mbps. Mostly used connection is LTE or 4G connection. With the help of home computers, laptops, and mobile app, a patient can communicate with a physician. Here, the computer serves and mobile serves as video platform. Qualified computer and technical support are necessary for this program. The supporting staff has to ensure stable and secure internet connectivity. However, physician access at all times is critical.[4]

It helped a huge population after its arrival and especially during this COVID-19 pandemic period. It helped by reaching the rural population, people with mild symptoms, and the patients with a daily routine checkup.

Telehealth comes in three distinct domains.[5]

1. Store and forward – In this type of telemedicine, patient information such as medical images, medical reports, or biosignals are sent to the specialist whenever it has been acquired from the patient. Then, the data are assessed by the doctor offline and the final diagnosis is given later. The data could be in any form, for example, X-ray, blood reports, etc. This saves the time of both patient and doctor. However, it depends on history report and documented information or images rather than a physical examination which may cause misdiagnosis

2. Remote monitoring – It is also called self-testing as the patient uses a range of technological devices to assess their clinical signs and health. Most commonly used for hypertension and diabetes mellitus. A patient may use a glucometer and electronic sphygmomanometer for assessing their blood glucose and blood pressure. However, this also contains some shortcomings like the tests conducted by the patients themselves might be inaccurate

3. Real-time – During a real-time telemedicine encounter, patients and physicians hear and see each other through video conferencing. Telehealth encounters should be conducted using technology that has been designed to protect patient privacy by Health Insurance Portability and Accountability Act.

TELEMEDICINE PROGRESS IN INDIA

For the development of telemedicine in India, many steps are taken by ISRO, DIT (Department of Information Technology), Ministry of Health and Family Welfare (MoHFW), and state government.[6] ISRO was the pioneer of telemedicine in India with a Telemedicine Pilot Project in 2001, linking Chennai's Apollo Hospital with the Apollo Rural Hospital at Aragonda Village in Chittoor district of Andhra Pradesh. Ministry of Health in the Government of India has taken up a project such as Integrated Disease Surveillance Project, National Cancer Network (ONCONET), National Rural Telemedicine Network, National Medical College Network, and Digital Medical Library Network.[7] Integrated projects are also taken up as Pan-African e-network Project and SAARC Telemedicine Network Project. For a few years, ISRO has worked hard to broaden its telemedicine network by connecting 45 remote and rural hospitals and 15 super-specialty hospitals. Under the project Arogyasree, a mobile telemedicine cluster integrating multiple hospitals, medical specialists, and rural mobile units, initiated by the Indian Council of Medical Research (ICMR), has now collaborated with the University of Karlsruhe, Germany, to design an ECG Jacket for continuous monitoring of patient's ECG without hospitalization.[8] Under the scheme Tele-ICU, many of the Tele-ICU startups partnered with the government medical colleges to provide health care digitally to rural India. The Indian government launched a new Mitr Portal which offers free telemedicine and consultation services for COVID-19-related inquiries. Here, the third-party entities provide doorstep healthcare. Project StepOne is powering state helpline numbers by leveraging an existing network of cloud telephony queuing doctors offering consultations. Besides these, Aarogya Setu Mitr has listed 1 mg Dr. Lal Pathlabs, Metropolis, SRL Diagnostics, and Thyrocare to offer doorstep laboratory tests.[7]

Aarogya Setu app

It is a mobile application to keep people informed of their potential risk of COVID-19 infection. It also provides relevant and curated medical advisories related to the COVID-19 pandemic. This also provides a list of ICMR approved laboratories with a COVID-19 facility.[9]

CoWIN app

COVID vaccine intelligence work is an app started by MoHFW for vaccine registration. It also identifies target group and track those who need to be administered the doses. It also provides vaccination certificates.

Various apps/platforms for teleconsultation

Teleconsultation Apps	Purpose
Mitr Portal	To provide information
StepOne	To provide information
Aarogya Setu	To provide information
CoWin	Vaccination Registration
Dr. Lal Pathlabs	Lab investigations
1mg	Online pharmacy
Metropolis	Lab investigations
SRL Diagnostics	Lab investigations
Practo	Online Doctor Consultation
Mfine	Online Doctor Consultation
TATA Health	Online Doctor Consultation
Doctor 24*7	Online Doctor Consultation
Thyrocare	Lab investigations

MERITS AND DEMERITS

Telemedicine has few merits and demerits.[10] It saves money and time. People do not have to waste time and money traveling to hospitals thus saving both time and money. It can make better access to health care. Old age and disabled people can have health-care facilities at their homes only. It provides access to preventive care that improves their long-term health. Studies have shown improved health of patients with coronary artery disease through telemedicine. People get health-care facilities at their convenience and comfort zone. Visiting a hospital means being in an infected area and this teleconsultation decreases the spread of infection. It also minimizes the infection risk to both patient and doctor. Many chronic patients can schedule teleconsultation from home for avoiding face-to-face clinic visits thus minimizing infection risk. It may decrease the load on doctors in hospitals and more availability of hospital beds and facilities can be given to a needful patient in conditions of scarcity. Farther reach a patient in rural areas, small cities with few hospitals can also get facilities. Patients with mild and moderate symptoms can get treatment earlier.

However, teleconsultation may have a few disadvantages. There is no insurance coverage. Medical data are mostly unprotected and might be hacked. There can be chances of medical fraud. It cannot provide emergency treatment or it may cause a delay in the treatment. A technologically sensitive patient must have a 4G connection; a patient might face technical glitches or weak connection issues. Surgical procedures cannot be carried out. Inability to examine a patient as a certain illness requires physical assessment. The patient may leave an important symptom that might be visible during face-to-face physical assessment which may lead to an incorrect diagnosis.

CONCLUSION

Telemedicine has shown a huge impact on the present healthcare system during COVID-19 pandemic and is being used in a variety of ways. Although, it has certain limitations when it comes to treatment, indeed both doctor and patient are learning to adapt to this technology.

Declaration of patient consent

Patient consent is not required as there are no patients in this study.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Dasgupta A, Deb S. Telemedicine: A new horizon in public health in India. Indian J Community Med 2008;33:3-8.
2. World Health Organization. Telemedicine-Opportunities and Developments in the Member States. 2nd ed. Geneva, Switzerland: World Health Organization Press; 2010.
3. National Aeronautics and Space Administration. A Brief History of NASA's Contributions to Telemedicine. Washington, DC: National Aeronautics and Space Administration; 2013.
4. Reed ME, Huang J, Graetz I, Lee C, Muelly E, Kennedy C, *et al.* Patient characteristics associated with choosing a telemedicine visit vs office visit with the same primary care clinicians. JAMA Netw Open 2020;3:e205873.
5. Smith Y. Types of Telemedicine. News-Medical; 2021. Available from: https://www.news-medical.net/health/Types-of-Telemedicine.aspx

[Last accessed on 2021 Oct 01].

6. Chellaiyan VG, Nirupama AY, Taneja N. Telemedicine in India: Where do we stand? J Family Med Prim Care 2019;8:1872-6.

7. Mishra S, Kapoor L, Singh I. Telemedicine in India: Current scenario and the future. Telemed J E Health 2009;15:568-75.

8. Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: Systematic literature review. J Med Internet Res 2020;22:e16407.

9. Bhalla K. Aarogya Setu Launches Mitr Telemedicine Portal For Consultations; 2020. Available from: https://inc42.com/buzz/aarogya-setu-mitr-telemedicine-portal-launched-for-consultations [Last accessed on 2020 May 04].

10. Martinez K, Villines on Z. Telemedicine Benefits: For Patients and Professionals; 2020. Available from: https://www.medicalnewstoday.com/articles/telemedicine-benefits [Last accessed on 2020 Apr 20].