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## RESEARCH ARTICLE

### TELEDENTISTRY: AN ESSENTIAL STEP DURING COVID-19 OUTBREAK

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#### ABSTRACT

The epidemic of coronavirus disease in 2019 (COVID-19), has become a major public health challenge for countries around the world. The World Health Organization announced that the outbreaks of the novel coronavirus as a public health emergency. A route suggested for human-to-human transmission is through airborne droplets, touching or coming into contact with an infected person or a contaminated surface. Dentists are at higher risk of getting infected and need to take concerned precautions. Telemedicine has been used in almost all medical specialties but not so widely used or accepted in dentistry. Teledentistry is an emerging mode of practice which indicated great potential in fields of clinical practice as well as public health delivery. It has a major role in providing information regarding the medications without risking the contact contamination. Teledentistry eliminates that barrier and provides a smoother practice environment. This review signifies the importance of teledentistry during the outbreak of COVID-19.

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#### INTRODUCTION

The coronavirus disease (COVID-19) is a newly discovered viral infection that started in Wuhan, China and caused the outbreak of pneumonia in the rest of the world. It seems that this virus is more contagious than Middle East respiratory syndrome coronavirus (Meng, 2019). A suggested route of human-to-human transmission is through airborne droplets, touching or coming into contact with an infected person or a contaminated surface. Moreover, other routes such as blood or saliva have not been explored but are possible because of the documented transmission of blood-borne infectious diseases. These routes of transmission increase the concern about a similar route of transmission for COVID-19 in the dental setting (Ibrahim et al., 2017). The dental clinic had the possibility of transmitting and acquiring the infection between staff or individuals. The dental clinic could be much risky environment for spreading the virus because of the close contact with patients and the nature of the dental treatment (Zemouri et al., 2017). Although patients diagnosed with COVID-19 are not supposed to receive dental treatments, but dental emergencies can occur, and close contact would be unavoidable. New technologies have been developed which can be used to communicate with

patients and guide them for medications without risk of contamination. Cook in 1997 described the term "Teledentistry". (Khader, 2020). Teledentistry is a relatively new field which has emerged with the dawn of information technology. The base of teledentistry lies in telemedicine and it provides new horizon for the progress of dentistry as well as offer new challenges. The changes that came into the fields of healthcare research due to telecommunication technology were astonishing and it has improved the quality and speed of health care delivery. The terms that we use to describe health care services at a distance, such as telehealth and e-health are currently used as umbrella terms (Nagarajappa et al., 2013). The term teledentistry is defined as "The practice of using video conferencing technologies to diagnose and to provide advice about the treatment over a distance". (Cook, 1997) It is also defined as "The segment of the science of telemedicine concerned with dentistry which deals with the entire process of networking, sharing digital information, distant consultations, workup and analysis". Teledentistry is the communication method which allows the dentist to deliver the information related to health care to the patient directly, without getting contaminated by the novel coronavirus.

#### Types of teledentistry

##### There are two different forms of teledentistry

Two Way Interactive/ Real-Time: This type of teledentistry is a synchronous type of telemedicine and can be as simple as a

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telephone call of a general practitioner to a specialist for confirmation of a diagnosis, or it could be as complex a robot assisting remote surgery. In this type there is no storage of the data and it is streamed live between the two parties involved. Video conferencing equipment is one of the most common forms of technology used in this type of communication (Folke, 2001)

**Store and Forward:** It is derived from the asynchronous type of telemedicine and involves the gathering and forwarding of data in stored form to different locations. These data packets can be patient files, X-Rays, digital photographs, CT Scans, MRIs, EEG data etc (Clark, 2000)

#### ADVANTAGES OF TELEDENTISTRY

- Less cost and improved quality of health care.
- Increased specialist support in education.
- General dentists will send multimedia patient records to dental specialists, often enabling the specialist to make a diagnosis and develop a treatment plan without having to see the patient in person.
- Improved diagnostic services.
- Improved integration of Dentistry.
- Improvement in communication with the Insurance industry with respect to requirements.
- Improvement in communication with dental laboratories (Sanjeev, 2011)

#### Role of teledentistry

**Role in Education:** The role of teledentistry in education can be categorized broadly in to- self instruction and interactive video conferencing (Chhabra, 2011). The Massive Open Online Courses are an example of the self instruction method. The web based self instruction educational system contains information that has been developed and stored before the user accesses the program (Johnson, 1999). The advantage of these systems is that the user can control the pace of learning and can access the data multiple times. But there may be dissatisfaction due to the lack of face to face communication. Interactive video conferencing can be conducted over telephone, satellite, internet or intranet. It includes both video setup and supportive information such as patient's data, radiographs, and case files etc (Chhabra, 2011). The advantage is that the user can receive immediate feedback but this system is heavily dependent on a live infrastructural support.

**Role in Clinical Practice:** Teledentistry has the potential to revolutionize the clinical care delivery and patient care platforms. The incorporation of teledentistry lowered the clinical costs as specialty care could be delivered with the supervision of a specialist even in their physical absence. Care and opinion can be gathered even from across borders (Bimbuch, 2000)

**Role in Dentist – Laboratory Communication:** The good communication is necessary between the technician and the dentist to avoid complications. In such cases the ability to communicate with the technician directly from the operatory and to provide him/her with additional data such as color photographs or shade data can help to prevent fabrication of improper prosthesis or appliance whereby saving time and money (Arora, 2014; Chen *et al.*, 2003)

**Role in Public Health Systems:** The most important field of teledentistry is its involvement with public health and public health delivery. India being a developing country and consisting of remote villages where conventional mode of care delivery is still not universal, prudent solutions such as teledentistry should be of great value (Anon, 2014).

**Government initiatives for teledentistry:** Ministry of Health and Family Welfare is currently implementing its Integrated Disease Surveillance Program Network, which will connect all district hospitals with medical colleges of the state to facilitate teleconsultation, tele-education, training of health professionals, and monitoring disease trends (Mishra, 2009).

**Ethical and legal concerns:** There are concerns about the safety of the data that is transmitted via the teledentistry. Similar to all online systems, these systems are also susceptible to hacking and data theft issues. The most important concern from the patient point of view is that of confidentiality of the data (Mishra, 2009)

#### Future prospective

The various ethical and legal issues addressed above needs to be solved. Some measures can be adopted for the effective implementation of teledentistry like

- 1) Involvement of teledentistry in dental studies.
- 2) Proper licenses of the protocols.
- 3) Practitioners should make sure about the security of their systems and data (Golder, 2000)

#### CONCLUSION

Telemedicine is not a new term in India. Teledentistry is still considered under the wings of telemedicine and is yet to be recognized in its own right. Dentistry combined with information technology has the potential to revolutionize the way in which clinical and primary health care is delivered in our country. The primary focus of our society has shifted from treatment to prevention and teledentistry has now become an invaluable asset in our arsenal.

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