

Global Scenario of Teledentistry during COVID-19 Pandemic: An Insight

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ABSTRACT

With the advent of the coronavirus pandemic, dentistry has faced a halt as it involves face-to-face interaction with patients which had to be suspended for quite some time. Teledentistry (TD) can offer an innovative solution to resume dental practice during this pandemic. This paper gives an insight into the practice of TD being used in various countries to aid in the management of dental problems arising during the coronavirus disease 2019 (COVID-19) era. It also reviews the utilization of TD for academic institutions to facilitate educating dental students across the globe.

Keywords: Corona, Diagnosis, Emergency.

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INTRODUCTION

In the early weeks of 2020, coronavirus disease 2019 (COVID-19) had spread globally and was soon categorized as a pandemic by the World Health Organization (WHO).^{1,2} It is believed to have originated in Wuhan, China, and is caused by the highly transmissible novel coronavirus (2019-nCoV or SARS-CoV-2) causing severe acute respiratory symptoms.³ By the end of October 2020, the disease was believed to have affected over 47 million people worldwide and claimed at least 1.2 million lives.⁴

SARS-CoV-2 is mainly transmitted directly through sneeze, cough, and droplet inhalation, but also via contact transmission through mucous membranes, in addition to saliva.⁵ Aerosols generated during medical procedures also pose a risk of virus transmission.⁶ Since dental procedures typically generate saliva and blood-containing aerosols, and since close proximity between patients and dentists is often necessary, dental visits carry the risk of large-scale transmission of the virus, despite infection control measures.⁷ For this reason, most dental practices on a global level limited their services to urgent and emergency care only during the early months of the pandemic. Health authorities such as the Centers for Disease Control and Prevention (CDC) and the American Dental Association as well as regional authorities, such as the Saudi Ministry of Health (MOH), have frequently published updated guidelines and recommendations for patient care during the pandemic in an attempt to minimize exposure to the virus and protect staff and patients.⁸⁻¹⁰ From the trend of COVID-19 cases over the past few months, there is global fear that the pandemic may not end any time soon, and may potentially turn into an endemic.¹¹ Thus, an adjunct, if not a complete temporary shift from traditional care, was crucial.

TELEDENTISTRY

Teledentistry (TD) is a subset of telemedicine that utilizes telecommunication and digital technology to provide dental care from a different geographical location.¹² It allows the real-time and store-and-forward exchange of clinical information and images. The primary reason for the development of this modern type of dentistry is to overcome the challenges of a shortage in human and infrastructural resources. The implications of adopting TD are

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significant, especially in expanding dental care to rural or remote areas. With advances in technology, TD has facilitated locally-based dental care and referrals to a larger population, with reduced waiting time, lower costs to patients and dentists, and minimal loss of productivity.¹³ Remote oral examination is less stressful than traditional examinations and may be helpful for pediatric patients and those with special health care needs (SHCNs).¹⁴ While the use of TD for the detection of dental caries has shown high reliability, it can also serve as a reliable adjunct for diagnosing oral malignant lesions.^{15,16}

There are many implications for TD, including but not limited to remote consultations, preventive care, supervision, oral health promotion, and education.^{17,18} Perhaps there is no better example of utilizing TD than what has been witnessed globally amid the COVID-19 pandemic. Due to the pandemic scenario of COVID-19 and the unique characteristics of dental settings that pose a high risk of virus transmission, a large population of patients has been temporarily discouraged from seeking dental care and a gap was ultimately created between patients and dentists. To bridge this gap, TD offered an innovative solution to resume dental care during the pandemic. Supportive care and consultations were enabled, and teletriaging of patients facilitated dental care to patients

with urgent and emergency needs. Teledentistry, in a sense, has digitally supplemented existing healthcare personnel in emergency facilities. Timely virtual visits helped stop the progression of dental caries and reduce the number of emergency visits, which was essential in reducing the burden on already-overloaded healthcare systems.^{14,19} Furthermore, there was an increase in information sharing between dental care professionals that aided peer education and provided second opinions.²⁰ Vulnerable populations, such as children with SHCNs, could benefit from remote consultation and telemonitoring without the need to leave their homes or institutions.¹⁴ Teledentistry also allows patients to continue their therapy during quarantine or lockdown.¹⁴

Teledentistry is essentially an adjunct rather than a replacement for routine dental care. Whenever physical examination or treatment is required after remote examination or consultation, appropriate dental treatment must follow. This is why it is of pivotal importance to ascertain the nature of dental emergencies. For example, infections that have spread into the deep fascial space of the head and neck can threaten airways and subsequently require immediate hospital admission and urgent in-person management.

TELEDENTISTRY IN THE MIDDLE EAST

Middle East countries responded with diversity to the outbreak. Some countries closed their borders and implemented a 24-hour lockdown, while others had more flexible lockdown curfews and allowed similar-to-normal daily life to resume. Nevertheless, dental clinics in the ME have reduced their running capacity, providing selective services based on acuity and urgency. In some countries, such as Saudi Arabia, dentists were encouraged to join the frontline alongside their medical colleagues in the fight against COVID-19.²¹ Furthermore, there was a general sense of anxiety within the public, and people were fearful of contracting the virus.²²⁻²⁵ Anxiety may have led people to stay homebound and postpone elective care, such as dentistry.²⁶ Not only did the public fear seeking dental care, but studies have also found that dentists themselves suffer from anxiety, distress, and depression due to COVID-19 in ME countries.²⁷⁻³⁰ As is the case in many regions of the world, dentistry has unfortunately become compromised in the ME during the COVID-19 pandemic and its impact on the industry may be long-term.^{26,29,31,32}

The main aims of telemedicine and TD during the pandemic were to avoid person-to-person contact and provide remote triaging of suspected COVID-19 cases to decrease the exposure of uninfected staff and patients to the virus. For example, the Saudi MOH has greatly expanded its two main telemedicine portals: the Medical Consultation Call Center and its e-health smartphone applications that serve an estimated 2 million users per month in different specialties.³³⁻³⁵ In Israel, Sheba Medical Center adopted telemedicine to monitor patients in quarantine and to remotely treat COVID-19 positive patients.³⁶ Despite the controversy, several initiatives of telemedicine have been created by groups of Egyptian physicians, primarily to encourage people to stay at home.³⁷

Studies on the utilization of TD during the pandemic in the ME are scarce. During lockdown in Jordan, professional all-dentist WhatsApp groups were used to discuss inquiries from patients and provide antimicrobial treatment accordingly.³⁸ In a study on Saudi dental students, 56% of students provided teleconsultation using a smartphone during the pandemic, 78% said they would utilize TD in the future, and 70.7% said they support its use on a national

level.³⁹ Studies that did not investigate the utilization of TD *per se* still found that dentists preferred TD over routine care, whether it was clearly stated or indirectly implied.^{29,30,39}

TELEDENTISTRY IN SOUTHEAST ASIAN COUNTRIES

Teledentistry in Malaysia is utilized by three prominent zones. The first zone involved the institutions/university level, which catered to all the undergraduate and postgraduate students. The second zone involved the government-aided primary care dental clinic which catered only to their patients and the community at large. The third zone is private dental practice/clinics which care for their patients along with training their junior doctors.

Teledentistry-based Learning in a University

Online lectures, problem-based learning (PBL), case-based learning (CBL), seminars, and tutorials are popular methods of TD-based learning with university or academic colleges. To deliver these, online platforms like Zoom, Facebook live are utilized. But these portals proved their limitations for simulation laboratory demonstration like cavity preparations, making of an impression, etc. To tackle these challenges, online webinars are conducted which included demonstrations. Most of these lectures and webinars are converted as YouTube videos for the students to watch again with the password provided. The final year dental students made the maximum usage of TD to follow-up with their patients. The academic staff constantly guided the students to share dental images and videos with the patients and try and make the patients feel comfortable with this method of consultation. Most of the case history was recorded online except for the dental charting. There is no denying that these methods of teaching have advantages like ease of delivery, recording it makes it feasible to listen again, ability to improve access to oral healthcare, improve the delivery of oral healthcare, and lower its costs. But unfortunately, the limitations were more than the advantages. The biggest disadvantage was to consider the extent to which it would be considered appropriate to provide advice to a patient remotely either directly or in conjunction with a treating clinician. We had to make sure that any patients involved are fully aware of the limitations of TD when it comes to meeting their expectations. It is also important to ensure that they properly understand any constraints, limitations, or risks introduced as a result. These factors and any discussions with patients were fully recorded in the clinical records. The students from my university found it a convenient, time-saving, and well-planned method to schedule future appointments for these patients following the COVID-19 SOP. Academically, TD proved to be more beneficial both for teaching and treatment planning for patients. Since it was used in a guided and controlled environment, e.g., students received the online teaching schedule well ahead of time, so they were prepared with their connectivity and appropriate devices, the patient's telephonic consultations and sharing of dental images and videos was done under an academic staffs approval and guidance, it proved to be a boon for most institutions and universities. Post COVID-19 a guideline-based TD format can be designed for ease of operation.

Teledentistry in Government-based Dental Clinic

The usage of TD in government-based dental clinics was limited. The limitation is centered due to the poor availability of smartphone devices and networks especially in the remote rural areas where

these clinics are based. To counter the problem, the clinics are utilizing social media like Facebook, Instagram, TikTok; to create videos, posters, and short movies to spread awareness and educate the people regarding oral cancer, smoking, dental caries, oral hygiene, etc. While launching these videos, the patient will be tagged online to keep them updated. For those patients without smartphones/devices, a telephonic call through the landlines is made to the dentists for emergency consultations.

Teledentistry in Private Dental Clinic

The private clinics are making the maximum benefit of the true TD. Most clinics prefer online consultations, sharing photographs of patients through applications like messenger, WhatsApp, telegram, etc. Some clinics are also providing video consultations for emergency services. Though these clinics admit that they are consulting online but they refuse to provide any online medications to the patients. These consultations are limited only to “online diagnosis and treatment planning”. These patients are later given appointments following the COVID-19 protocols before the treatment commences.

In conclusion, the concept of TD is slowly yet warmly received by the Southeast Asian countries. They still prefer the conventional classroom face-to-face learning system over the digital learning medium. Patients also have to make tough decisions as meeting a dentist by walking into the clinic anytime is now not encouraged. Elderly patients are not well adapted to the usage of smartphones devices and other online applications. These drawbacks of TD are serious and require modifications and up-gradation if it proves to be the future “new normal”.

TELEDENTISTRY IN INDIA

In the present conditions of the COVID-19 pandemic, with improving the probability of it turning out to be endemic, the fundamental point is to avoid person-to-person contact. Dental treatments are aerosol-generating procedures and pose a high risk to practitioners as there is a strong possibility of cross-infection and them acquiring the disease or becoming potential carriers.⁴⁰ Teledentistry is a subhead of telehealth with provisions for dental care at a distance with the aid of information and communication technology.

In the current circumstance, screening and triage questions, e.g., significant manifestations, travel history, or contact with known COVID-19 patients can be evaluated through TD.⁴¹ Teledentistry gives a stress-free climate to the assessment of the child patient as the child is consoled and sitting with the guardians at home. Convenient and timely consultations can reduce the number of emergency visits, which gets significant in the current time of extra burden on medical care frameworks. The importance of regular toothbrushing and other preventive care can be reiterated to the parents through TD. In a crisis circumstance like the COVID-19 pandemic, TD can go about as a promising technique for maintaining patient contact and some elements of dental care including screening, triage, pharmacotherapy, referrals, education, and research.⁴²

Teleconsult and telescreening have also been suggested in the “Guidelines for Dental Professionals in COVID-19 Pandemic Situation” issued by the Ministry of Health and Family Welfare, Government of India. Telephone screening is encouraged as the first point of contact. Teledentistry in the current scenario of COVID-19 focuses on “dental triage”, the relief of pain or infection, provision of dental care by remote consultation, planning, and scheduling of

the definitive dental treatment. Teledentistry is fused into routine dental practice as it offers a wide scope of utilization, e.g., far off triaging of the suspected COVID-19 patients for dental treatment and diminishing the superfluous introduction of solid or uninfected patients by diminishing their visits to effectively troubled dental workplaces and medical clinics. In India, TD is used to improve access to oral health services and can act as a practical solution in emergency aid, initial consultation, and expert opinion during the COVID pandemic.

A study was conducted in Lucknow likewise detailed that patients have a positive tendency toward preventive measures to inhibit the spread of novel coronavirus, which slanted them to favor TD as an option in contrast to the clinic visits.⁴³

In India, TD can serve as a good tool for educating undergraduate and postgraduate students and for giving proceeding updates to the rehearsing dental specialists during the current pandemic. In interactive video-conferencing (using various platforms, e.g., Webex, Zoom meeting, Google Meet, etc.), the patient information is evaluated first (with or without the patient’s presence), which allows for the interaction and feedback between the educator and the students. The cases can be discussed at length after all the clinical data have been collected and transmitted, without the patient being present at the scheduled meeting. This upgrades the understudies’ excitement and gives new learning occasions to the dental understudies and the rehearsing dental specialists. Teledentistry can serve as a tool to complement and expand the capacity of dental education institutes to meet the students’ needs by using technology.

CONCLUSION

When access to dental care is impaired, as with the COVID-19 pandemic, TD can provide an innovative solution to continue dental practice work and allow wider visibility of dental professionals. Teledentistry should be incorporated into a routine dental practice and be taught as a solution for the prevention of infection transmission, even after the acute phase of the pandemic is over. More studies around the globe are required to add to this body of evidence.

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