



## Teledentistry as a Supportive Tool to Overcome the Restrictions during COVID19 Pandemic

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In the beginning of 2020, a pandemic emerged affecting the entire world. Where in January, the World Health Organization announced it a public health emergency of international concern and in March 2020 as a worldwide pandemic. COVID-19 is transmitted mainly through person-to-person contact (respiratory droplets and aerosols) and via contaminated surfaces [1].

The current situation of the COVID-19 pandemic worldwide has put the healthcare professionals and the patients in an emergency period that has forced the healthcare professionals to seek different alternatives for providing healthcare services other than the in-person direct examination in the clinics. Beside that droplets and aerosols produced during dental treatment, which are the main cause of transmission of the virus, jeopardize the dental professionals. Dental management comprises close examination, assessment and therapeutic procedures of the oro-pharyngeal region of their patients, thus dental practitioners are categorized at high risk to be affected with COVID-19. Hence, dental clinics have mostly been suspended during the COVID-19 pandemic and just managing painful emergency cases and critical surgeries are done [2,3].

The rapid and extensive spread of COVID-19 is the main concern about the disease and determined certain procedures to be followed to contain its transmission like maintaining 6-feet social distancing, avoiding gatherings and inadequately ventilated indoor places that have affected the dental practice economy and the health care system.

Teledentistry is preferably used for distant patient care and follow up. This offered an innovative solution to resume dental practice during this pandemic by utilizing new electronic methods of healthcare provision to practice dental care with minimal hazard of cross infection and transmission of the disease.

The expression “telehealth” is known to public health and healthcare facilities, delivered with the assistance of information technology and equipments to offer healthcare at a place far from the patient to provide patient consultation, diagnosis, treatment planning and follow up. Teledentistry is a division of telehealth that enables dental care remotely with the utility of information technology and connections. Legal and qualified obligations in dental practices that are concerned to be used in the clinics and hospitals are also applied on teledentistry [4].

Although Teledentistry is fast growing and improves with the increasing incidence of COVID-19. Teledentistry is not a new model where US military in 1994 started to use Teledentistry applications to provide services to the US troops around the world. In 1997, Cook defined teledentistry as “the practice of using video-conferencing technologies to diagnose and provide advice about dental treatment over a distance”. Tele-dentistry is “a combination of telecommunications and dentistry, involving the exchange of clinical information and images over distant places for dental consultation and treatment planning” and includes the use of phone, photos and videos to assist provision of oral healthcare and oral health education services.

Teledentistry include two practices: real-time consultation and “store and forward.” Real-time consultation implicates a videoconference between the dental specialists and their patients, who are at different places, may see, hear, and communicate with each other at same time by using advanced telecommunication technology and strong network connections. On the other hand store and forward includes the exchange of clinical information and high quality photos uploaded and stored in the database by the practitioner who later forward them to a professional for consultation and treatment planning.

Teledentistry has subdivisions as tele-consultation, tele-diagnosis, tele-monitoring, and tele-triage, each having important roles significant to dental practice. Tele-consultation assists in reducing non-critical patient referrals, thus reducing the burden on already overloaded healthcare systems. Tele-diagnosis aids using the advanced technology to exchange intraoral photos, radiographic images and patient's records to diagnose oral diseases remotely. Tele-triage focuses on patients demanding urgent dental management after distant evaluation of oral health, thus reducing the need of unnecessary travel, especially in the pandemic situation [5].

As time passed teledentistry had new advancements in the field of dentistry and has revealed to be valuable for distant dental screening, making diagnosis, affording consultations by allowing exchange of clinical information and photos, and proposing treatment plan and enabling remote dental care, patients' education, and assistance and this satisfies the need for social distancing by avoiding person-to person contact as has been advocated by the health authorities worldwide.

Teledentistry in COVID-19 pandemic emphasizes on "dental triage," where assists in prescription for the relief of pain or infection, and providing dental care by distant consultation, and planning for definitive dental management. Technological advances have improved the current routine dental practice where digital dentistry is emerging rapidly and showed amazing progress in the dental practice. Teledentistry has a variety of uses that help improve oral healthcare approach to the patients, improve the oral healthcare service, help the under-served populations to reach the appropriate consultations remotely where increased specialists availability and in the cost it can be economic and time saving for both the dentist and the patient.

During the shutdown, some dentists have setup telehealth services to provide patients with temporary procedures for urgent care evaluations and writing prescriptions to relief and stop pain and/or acute infection until definitive procedures can be done. In addition, after emergency visits can provide follow-up care; and virtually triaging patients for COVID-19 symptoms. Teledentistry can be integrated into usual dental practice to help reduce the spread of COVID-19 as it can offer distant triaging of the suspected patients for dental management and reducing the risk of contact for healthy patients by reducing their appointments to the dental clinics and hospitals thus reduce the crowding.

Teledentistry can be used in diagnosis and treatment planning in almost all the branches of dentistry. A literature review that denotes the advantageous applications of teledentistry in different branches of dentistry including the field of oral medicine and diagnosis, oral and maxillofacial surgery, periodontics, pediatric, endodontics, prosthodontics, orthodontics, and preventive dentistry [6,7].

For Teledentistry application, the patient must have a smartphone with high image quality and good internet connection or he visits dental hygienist in temporary dental clinics, e.g. in a school or senior center in rural areas to communicate him with the specialist. For the practitioner, a cloud-based platform can provide both real-time flowing of videos and "store and forward" of uploaded clinical data, containing data from the electronic health record and images received from the patient. This platform is able to store all the data permitting the dentist to assess the patient' case and make recommendations remotely.

Challenges for the acceptance by dentists to teledentistry can be related that they find it complicated and are unwilling to acknowledge new skills. They may be technologically challenged, fear making an inaccurate diagnosis, and they are worried about the increased costs and expenses. Beside the constraints associated to infrastructure supplies as poor network connection, deficiency of hard-ware, lack of training, shortage in the technical support and proficiency. In addition, organizational inappropriateness of teledentistry with the healthcare system, inadequate financial repayment, insufficient guide-lines, incoordination between distant and main center, and high cost of framework. To overcome these challenges, dentists should be trained effectively and well-informed about this technology, which will expand their acceptance of teledentistry.

The COVID-19 pandemic initiated the need to follow different routes to manage the patients other than face to face, where Teledentistry showed its appropriateness and this opened several opportunities for dental researchers to evaluate this effectiveness in different dental branches and the problems that can be safely addressed using tele-dentistry and its application in different countries worldwide especially in the rural areas. The research may include estimating the benefits of expanding the use of Teledentistry and its effect on the patients and proper dental management and which dental branches that benefit the most. In addition to consider the privacy of the data collected and the ethical concerns and the

filing of these documentations and the cost and facilities required to spread the use Teledentistry services.

Due to the current pandemic, it is recommended to add topics about teledentistry in dental school curriculum for the future dentists to be updated and aware of it as an alternative solution for prevention of infection transmission for management of the patients remotely beside the other benefits.

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