

# TELEDENTISTRY APPLICATION DURING COVID -19 PANDEMIC IN SAUDI ARABIA: AN OVERVIEW

Nishath Sayed Abdul<sup>1\*</sup>

<sup>1</sup>Department of OMFS & Diagnostic Sciences, Faculty of Oral Pathology, Riyadh Elm University, Riyadh 11681, Kingdom of Saudi Arabia. nishathsayed@riyadh.edu.sa

<https://doi.org/10.51847/ZU8KmFv20K>

## ABSTRACT

The current COVID-19 pandemic is a global concern. This outbreak is a reminder of Middle East respiratory syndrome coronavirus (MERS-CoV), which has spread rapidly in the Middle Eastern regions in 2012, with 871 deaths and a fatality rate of 39%. Coronavirus disease 2019 is also called COVID-19 or SARS-CoV2 (severe acute respiratory syndrome coronavirus 2). The current COVID-19 was declared by the world health organization (WHO) as public health emergency of international concern (PHEIC) on January 30, 2020. Teledentistry is a boon to the dental fraternity and to all those patients who need dental attention in the present-day situation. Teledentistry is an effective way to triage patients and to deliver emergency dental care. Therefore, it reduces the risk of nosocomial and communicable spread of the virus caused due to person to person contact in dental offices. This article gives an overview of Teledentistry's applications, scope, and significance in the current COVID-19 crisis.

**Key words:** COVID-19, MERS CoV, Teledentistry, Saudi Arabia

## Introduction

The Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by the coronavirus family was first identified in Saudi Arabia in 2012 and was named MERS-CoV. Healthcare-associated outbreaks had occurred in numerous countries, with the largest outbreak in the UAE, KSA, and the Republic of Korea. The source of this virus was infected dromedary camels. This virus's transmission route was from animals to humans, then human to human, with or without pneumonia [1].

Recently, another virus belonging to the corona family was discovered in December 2019 in Wuhan city, Hubei Province, China [2]. It was linked to a wet seafood market; the infection source was from bats and therefore considered zoonotic [3]. Concerning the outbreak of SARS-CoV-2, WHO declared the disease as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020 [4]. International committee on taxonomy of viruses named this novel coronavirus as SARS-CoV2. Whereas, WHO named it Corona Virus 2019 or CoVID-19 on February 11 2020 [5]. As this virus had spread at alarming levels to more than 100 countries across the globe, through human-to-human transmission and was declared as a global pandemic by WHO on March 11, 2020 [6]. The mode of transmission of COVID-19 was reported to be from personal contact and droplets from talking, coughing, sneezing to the subjects nearby. COVID-19 infection includes fever, cough, and acute respiratory disease leading to severe conditions like pneumonia, kidney failure, and death. Few asymptomatic infection cases were also reported [7, 8].

Teledentistry is the use of telecommunications and information technology for public awareness, education, consultation, and dental care in the same way as telehealth and telemedicine. It enhances communication, the exchange of health information and access to dental care for all kinds of patients placed at distant places [9].

The dentists when exposed to virus-infected patients, during dental procedures, can cross-infect the virus to other patients and to the dental personnel in the dental offices. Therefore, the protection and safety of the patients and health care workers must be associated with the prevention of the nosocomial spread of the virus through dental offices, which is possible by the application of Teledentistry. This paper provides an overview of the applications, scope, and significance of Teledentistry in the COVID-19 outbreak in Saudi Arabia.

### Need for teledentistry

Health care providers have been working day and night throughout the world to treat virus-infected patients, unfortunately, some of them got infected and died. On March 15, 2020, the New York Times published an article entitled "The workers who face the greatest coronavirus risk". This article stated that the dentists were at greater risk for virus infection, much more than nurses and general physicians [10].

The predisposing risk factors involved for the dentists and for the healthy patients in the dental office, when exposed to a person or persons having signs and symptoms of the virus infection such as coughing, sneezing, and fever seeking dental treatment; the virus can spread from infected patient

to dentist, and from dentist to other dental personnel in the dental office. Therefore, the risk of communicable spread of COVID-19 can be minimized by the effective application of Teledentistry.

### Materials and Methods

Synchronous Teledentistry or "Real-Time Consultation" is the delivery of patient care and education, using live video conferencing; it is a two-way interaction between the patient at one place and the dental provider or dentist at another place using audio-visual telecommunications technology [11].

International health agencies such as the world health organization (WHO), national centers for disease control, and health departments have been disseminating real-time information about COVID-19 through websites and social media outlets. These organizations can play a vital role in increasing awareness of Teledentistry and validate the effectiveness of Teledentistry in the health care sector [12, 13].

Asynchronous Teledentistry, also known as "store-and-forward", is the transmission of recorded health information (e.g., photomicrographs, digital impressions, video, photographs, and radiographs of patients) through a secure electronic communications system to a dentist who uses the information to evaluate a patient's condition or render a service without live video conferencing with the patient [14].

#### *Scope of teledentistry in Saudi Arabia*

There were limited publications on Teledentistry in Saudi Arabia [15, 16]. Ministry of health Saudi Arabia is tremendously working hard leaving no stone unturned in order to prevent and control the spread of COVID-19.

As per the Saudi center for disease control [SCDC], certain rules and regulations were made for social distancing and the people should report to health care facilities (HCFs) or health electronic surveillance network by calling the specific numbers given by the ministry of health so that the health team responds spontaneously and categorizes the household and community contacts as per the symptoms and test the people without charging and isolating them from the rest uninfected [17].

Web-based Teledentistry is widely used in Saudi Arabia. It is a self-instructional educational system, which contains information that was stored before the user accesses the program. Its advantage is, the user can control the pace of learning and review the material as many times as he/she wishes. This helps the population to know the information related to COVID-19 [18].

Ministry of Health, Saudi Arabia introduced two apps in 2019, to combat the COVID-19 outbreak in Saudi Arabia. These apps are smartphone apps, which help in consultation

and guidance and are free of charge for the people of Saudi Arabia. Mawid app is for self-assessment test for COVID-19 for the suspected cases and books their appointment in health care centers for further testing. The Saudi Ministry of Health introduced Tatamman App (meaning, rest, assured) to assist self-quarantined people. This app will help to monitor the conditions of people who are self-isolated or quarantined to access up-to-date advice and information about their health status and about the virus. With the introduction of these E-services portals for the people, the Saudi government had given moral support and hope to the infected people who were paranoid about their health [19].

#### *Applications of teledentistry during COVID-19 crisis*

Teledentistry plays a key role in the present challenging situation, with the help of Teledentistry, the contamination of patient to the patient and also patient to the dental practitioner can be avoided. Using teledentistry, the patient can consult the dentist through telephonic conversations or through messages, WhatsApp, or video conferencing and inform about their dental and general health status.

Teledentistry is a cost-effective service that can be provided to rural and urban people living in distant places without the patient being traveled to the dental clinics. Teledentistry increased specialist support for the diagnosis of disease, based on signs and symptoms through videoconferences. It is a great opportunity for general dentists, they can mail or WhatsApp the patient records and images of x-rays to dental specialists, to make a diagnosis and develop treatment plans without the presence of the patient itself.

Through Teledentistry, educational awareness about COVID-19 to dental patients is possible. Through Teledentistry, the communicable and nosocomial infectious spread of the COVID-19 can be prevented or controlled to a large extent. Similarly, utilizing Teledentistry, dental patients with positive symptoms of virus infection can be helped with remote assessment (triage) and provide guidance towards health care facilities for further testing [20].

#### *Limitations of teledentistry*

It requires proper internet connections for teleconferencing, a backup communication system, and a technical support group. Legal issues including licensure, malpractice, reimbursement barriers, privacy, security, and ethics are involved. If technical errors occur during data transmission that causes a misdiagnosis or medical error, Malpractice needs to be considered and curbed. Privacy and security are important issues in cyberspace. If a patient's data are stolen or lost during the transmission process, the entire project may need to be stopped, particularly when the health insurance portability and accountability act becomes a law. The experience of the peer dentist and his knowledge is also varied. Discussion of problems on social networking sites is risky [21].

**Recommendations**

Ensure that the Teledentistry instructors are well versed with computer science and that they should have adequate teaching experience in the field. These issues include jurisdiction, inter-state licensure, malpractice, reimbursement barriers, as well as technological, cybersecurity, and ethical aspects that need to be solved. Accreditation of teledentistry health professionals should be approved. Provide funding that adequately covers the cost of setting up Teledentistry. Support all stakeholders with an effective communication and change management strategy. Apply Teledentistry services on a regular and outline basis as a health care provider.

**Conclusion**

These situations highlight the importance of providing oral care through Teledentistry to uninfected people during an infectious pandemic such as COVID-19. Tremendous changes in the world oral health care and oral health awareness in the population can be possible by the application of Teledentistry. The government of Saudi Arabia can initiate programs and support the effective use of Teledentistry in the Arab world during the pandemic outbreaks such as COVID-19. Teledentistry not only helps in providing dental care to the people in need but also provides educational awareness about the virus. Therefore, Teledentistry plays a key role in preventing nosocomial and community spread of the coronavirus 19 disease (COVID-19).

**Acknowledgments:** None

**Conflict of interest:** None

**Financial support:** None

**Ethics statement:** None

**References**

1. Barry M, Al Amri M, Memish ZA. COVID-19 in the Shadows of MERS-CoV in the Kingdom of Saudi Arabia. *J Epidemiol Glob Health.* 2020;10(1):1.
2. Magomedova UG, Khadartseva ZA, Grechko VV, Polivanova MN, Mishvelov AE, Povetkin SN, et al. The Role Of Covid-19 In The Acute Respiratory Pathology Formation In Children. *Pharmacophore.* 2020;11(5):61-5.
3. Eltayeb LB. An update about Coronaviruses with Emphasis on Newly Emerged COVID 19. *J Biochem Tech.* 2020;11(3):14-2.
4. World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV).
5. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci.* 2020;12(1):1-6.
6. World Health Organization. WHO Director-General's Opening Remarks at the Media Briefing on COVID-19- 11 March 2020. Geneva, Switzerland; 2020.
7. Meng L, Hua F, Bian Z. Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. *J Dent res.* 2020;99(5):481-7.
8. Sabino-Silva R, Jardim ACG, Siqueira WL. Coronavirus COVID-19 impacts to dentistry and potential salivary diagnosis. *Clin Oral Investig.* 2020;24(4):1619-21.
9. Jain A, Bhaskar DJ, Gupta D, Agali C, Gupta V, Karim B. Teledentistry: upcoming trend in Dentistry. *J Adv Med Dent Sci.* 2013;1(2):112-5.
10. Spagnuolo G, De Vito D, Rengo S, Tatullo M. COVID-19 outbreak: an overview on dentistry. *Int J Environ Res Public Health.* 2020;17(6):2094.
11. Sanjeev M, Shushant G. Teledentistry a new trend in oral health. *Int J Clin Cases Investig.* 2011;2(6):49-53.
12. World Health Organization. Critical preparedness, readiness and response actions for COVID-19-7 March 2020. Published online 2020.
13. Control C for D, Prevention. Coronavirus disease 2019 (COVID-19) situation summary. Published 2020. Published online 2020.
14. Jampani ND, Nutalapati R, Dontula BSK, Boyapati R. Applications of teledentistry: A literature review and update. *J Int Soc Prev Community Dent.* 2011;1(2):37.
15. Alawwad SM, Zakirulla M, Alasmari NM, MohammedAlamr M, Alshahrani RA. Perceptions of Teledentistry among Dental Professionals in Saudi Arabia. *Ann Trop Med Public Health.* 2019;22:11-20.
16. AlShaya MS, Assery MK, Pani SC. Reliability of mobile phone teledentistry in dental diagnosis and treatment planning in mixed dentition. *J Telemed Telecare.* 2020;26(1-2):45-52.
17. Memish ZA. Call to action for improved case definition and contact tracing for MERS-CoV. *J Travel Med.* 2019;26(5):taz001.
18. Bhambal A, Saxena S, Balsaraf SV. Teledentistry: potentials unexplored. *J Int Oral Health.* 2010;2(3):1-6.
19. Kingdom of Saudi Arabia- Ministry of Health Portal. Accessed February 11, 2021. <https://www.moh.gov.sa/en/Pages/default.aspx>
20. Ghai S. Teledentistry during COVID-19 pandemic. *Diabetes Metab Syndr: Clin Res Rev.* 2020;14(5):933-5.
21. Bradley M, Black P, Noble S, Thompson R, Lamey PJ. Application of teledentistry in oral medicine in a community dental service, N. Ireland. *Br Dent J.* 2010;209(8):399-404.