



## Teledentistry – A Novel Tool During Covid 19 Pandemic

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**ABSTRACT:** *The era COVID 19 pandemic was characterized by lockdowns and many people are unable to access healthcare services. Dental practice was posing unique challenges in the entire globe, entangled by the spread by the COVID-19 virus. In these circumstances teledentistry can provide an innovative solution to continue practice during the pandemic and as well as beyond. It became a vital tool for dentistry thereby reducing the chances of infection. If not fully replace, at least teledentistry can complement the prevailing compromised dental system during the pandemic by extending care to additional patient population at an affordable cost and it may target the problem of shortage of dental specialists up to a great extent.*

**KEYWORDS:** *Teledentistry, Covid 19, pandemic, oral health*

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### I. INTRODUCTION

The field of dentistry has seen in depth technological innovations in recent years. Advances are created at intervals with the utilization of computers, telecommunication technology, digital diagnostic imaging services, devices, and software for analysis and follow-up [1]. The internet has become the backbone of many as a result it offers real-time transfer of knowledge from a part of the globe to a different. These digital technologies haven't solely improved the standard of management of patients however even have made possible their partial or complete management at distances that area unit aloof from healthcare centers or qualified dentists [2].

Teledentistry is a combination of telecommunications and dentistry [3]. “Tele” is a Greek word signifying “distance” and “Mederi” is a Latin word sense “to heal”. India, with numerous terra firma, huge rural population and existing health care delivery mechanism clubbed with advances in telecommunications technology, could be an ideal setting for teledentistry [4]. Oral diseases are a burden for developing countries such as India, especially among the rural masses. Teledentistry would permit an economic option to remote communication/education among dental professionals, diagnosis, treatment planning and access to specialized consultation to people who have limited access to health services or economic limitations [5]. This innovative technology completely modifies our traditional approach, promoting a virtual technique of consultations, avoiding physical contact and direct clinical examination. Teledentistry can even be considered within the curriculum of dental and dental hygiene education as the way of providing comprehensive care to underserved populations [6].

Although unaided face-to-face screening has remained the gold standard approach to routine oral examination, this method is inappropriate in large epidemiological surveys as a result it requires substantial economic and human resources. Sorting out an inexpensive and valid alternative which will expedite diagnosis of oral diseases among rural populations, while maintaining a honest level of diagnostic accuracy, is crucial [7]. Despite such edges, factors such as irregular in-office visits could jeopardize patient compliance in terms of oral hygiene maintenance and adherence to the planned treatment protocol. Teledentistry screening by lay health aides is additionally a inexpensive thanks to cut back or eliminate barriers to optimal oral health, decrease the cost of tending care, and improve oral healthcare access and utilization by underserved populations [8].

The world was facing an unprecedented situation due to COVID 19 pandemic. In those circumstances teledentistry can provide an innovative solution to continue practice during the pandemic, as well as beyond. The impressive growth of teledentistry during the COVID-19 pandemic has led to an enduring impression worldwide [9]. It reduces hospital visits and enables patients to securely consult their dental problems or concerns from their homes. If not fully replace, at least teledentistry can complement the prevailing compromised dental system during the pandemic by extending care to additional patient population at an affordable cost and it may target the problem of shortage of dental specialists up to a great extent [10].

## **HISTORY**

Telemedicine began in 1924, with the concept of a physician seeing his patient over the radio. Telemedicine programs were initiated in 1950. Teledentistry is analogous to telemedicine, which was first utilized in 1970s by NASA and more recently by the US military. Teledentistry was developed as a totally unique domain at 1989 conference funded by the Westinghouse electronics system group in Baltimore [11]. In the 1990s the concept of ‘teledentistry’ was introduced. The U. S. army’s Total Dental Access (TDA) project is seen as being at the frontier of teledentistry which had begun in 1994. In 1996, California adopted the Telemedicine Development Act of 1996. This law put California within the position of national leadership on telemedicine policy [4].

Cook, in 1997, outlined this as “the practice of using video-conferencing technologies to diagnose and provide advice about treatment over a distance” [1]. In 2002, the Dental Health Aide Therapists (DHATs) Programme began in Alaska as an enlargement of the Community Health Aide Programme (CHAP). The CHAP has been the concept of the health care delivery system for rural Alaskan residents, providing 350,000 patient visits annually. Since then, numerous institute and organization have practiced teledentistry with varied degree of success [9].

## **PLATFORMS OR TYPES OF TELEDENTISTRY:**

Many platforms can be used for teledentistry. Some of these include telephone, text, and email for initial patient contacts, video conference solutions like zoom pro, Microsoft teams, or Webex. There are two primary ways in which teledentistry can be used as a service modality [13].

1. Real time teledentistry involves videoconferencing within which dental professionals and their patients, at different locations, may see, hear and communicate with each other. A kind of real time teledentistry is a remote monitoring method that involves monitoring patients from a distance which could either be from a hospital or home.
2. Store-and-Forward teledentistry involves the exchange of clinical information and static images collected and stored in a communication system by a dental practitioner who later then forward them to another practitioner for consultation and treatment planning.

## **DOMAINS OF TELEDENTISTRY:**

### **Teleconsultation & Telescreening:**

During COVID-19 pandemic, telephone screening should be encouraged as the first point of contact between the patient and the dentists & it can contribute to minimizing the spread of disease. Another method is video

conferencing in which dental professionals and their patients may listen, visualize and communicate with one another from distant places. It is also helpful for handicapped patients. In this way teleconsultation reduces the number of visits and referrals. The use of telemedicine consultation via the XPA3 Online system is also a valuable tool in the management of dental patients used in some countries [14].

**Telediagnosis:**

Telediagnosis makes use of technology to exchange images and data for making the diagnosis of oral lesions. Various kinds of telediagnosis programs and platforms are used worldwide to reduce the need for close clinical oral examinations like Estomato Net, telectology, Mobile Mouth Screening Anywhere (MeMoSA), tablet-based mobile microscope (Cell Scope device), etc. Various Telediagnosis programs in India include Tele-CME Programme, Collaborative Digital Diagnosis System, ECHO India, eDantSeva, etc. These platforms help a clinician in the early detection of oral potentially malignant lesions and oral cancers even without the physical presence of patients [14].

**Teletriage:**

Teletriage involves screening about the dental history and comprehending dental treatment according to the urgency of the desired treatment and risk and benefits linked with treatment procedures via smartphone by specialists. It has also been used for the assessment of school children located remotely and prioritizes them for dental care and treatments.

**Telemonitoring:**

Monitoring is an important aspect during and after dental care, which involves regular visits of patients to their dentists. As during covid19 times, face-to-face interaction is being avoided, telemonitoring becomes a vital tool for dentistry thereby reducing the chances of infection. Telemonitoring reduces the time taken by dentists for monitoring their patients and at the same time, it also reduces the cost of physically visiting and waiting time of the patients [14].

**APPLICATION OF TELEDENTISTRY DURING COVID 19 PANDEMIC**

Virtually all clinical procedures in dentistry involved indirect physical contact with a patient's body fluids such as blood, saliva, and lymphatic fluids. Although, it is expected of a dental personnel to use PPE, including face masks, hand gloves, protective gowns, head gears, etc., when performing these procedures so that indirect physical dentist-patient contact is assured; however, the use of PPE is not 100% safe, as there are possibilities of micro and macro tears of some of these PPE. Besides, there is a fear that SARS-CoV-2 may never go away, instead may turn into an additional endemic virus in the public domain. Teledentistry is a mode to provide access to oral health care in regions with no availability of general and specialized dental services and is coming up as a feasible solution in emergency situations, initial consultation, and expert opinion. Like other health-care professionals, dentists too can use smartphones, laptop webcams at their disposal to provide dental care to the most vulnerable dental patients safely in their home, without exposing themselves and the patient to unnecessary risks and expenses [15].

**Emergency consultations:**

Before COVID-19, patients telephoned the department to arrange a Face to Face (F2F) emergency appointment. A new protocol was developed for patients with problems during lockdown; Patients were encouraged to take photos themselves to aid diagnosis and to send the photos via the secure email address. The inbox was checked daily by secretaries working remotely. An emergency consultation was organized, with one clinician responsible for emergencies each day [16].

**New patient and multidisciplinary team clinics:**

NP and MDT Clinics continued remotely throughout the COVID-19 crisis, if comprehensive referral records (including photographs and radiographs) were available. The protocol developed for managing these clinics remotely. If additional diagnostics or a clinical examination was required, a F2F appointment was arranged for a post-COVID-19 clinic. It was always explained to the patient that the opinion given at the video consultation may be revised after a F2F examination and this was documented on the correspondence. Inappropriate referrals were triaged and returned to the referrer [16].

Latest updates in scientific publications about the impact of COVID-19 on oral health, such as the role of salivary glands as potential reservoirs for SARS-CoV-2, the appearance of possible oral vesiculobullous lesions and the presence maculopapular manifestations in suspected and confirmed cases. Based on the recent data, topical and systemic corticosteroid therapy is not recommended for COVID-19 infection. Hence, positive patients with immune-mediated oral conditions (pemphigus, pemphigoid, lichen planus) may present exacerbations of these manifestations during the period of viral infection [10]. Correspondingly, multidrug therapies in patients positive for SARS-CoV2 and hospitalization conditions could also result in oral

implications such as opportunistic infections, xerostomia, traumatic ulcerations due to orotracheal intubation, and periodontal disease. Teleorientation allows professionals to perform screening, guide, and refer patients in isolation to face-to-face assistance, if needed. Telemonitoring permits professionals to visually monitor patients suspected or positive for SARS-CoV-2 who present oral lesions through photographic control [17].

### **FEASIBILITY IN INDIA**

India is developing country and most of the population belongs to rural background where some of the basic amenities of daily routine life are missing. Primary health center and community health center can be equipped with modern telehealth and teledentistry to facilitate the education and better services in the society [18]. Government should take the initiative to highlight the importance and benefits of teledentistry in the society. But being a developing country, there are challenges as well among which uneducated population, poverty and lack of infrastructure being the major challenges. Apart from these, training of the dentists in use of newer technology, patient compliance, unreliability in internet connectivity, computer hardware and software problems and the need for on-site information-technology support are important issues which also needs to be considered [19].

### **PUBLIC HEALTH SIGNIFICANCE**

Teledentistry is a relatively new modality for the delivery of dental health services, increased training and continuing professional development for ICT use is required for general dental surgeons, specialists, dental auxiliaries, nurses, and others health professionals who deal with oral health issues. Moreover, to facilitate the adoption of TD in public dental services, these strategic actions must form an integral part of the public health policy agenda, which advocates TD as an evidence-based and cost-effective method for improving oral health [20].

## **II. CONCLUSION**

Currently, teledentistry has not yet become an integral part of mainstream oral health care system. This failure is impacted by the lack of research information supporting oral health practices and identifying innovative ways to use e-health to extend access to preventative care and improve the delivery of dental interventions. One of the most valuable aspects of teledentistry is the potential for reducing health-care inequities that result from lack of access to specialists and to timely oral-health care. Finally, to boost oral health, the development of health promotion material is crucial to reinforce the benefits arising from teledentistry. The development of an oral health care model that combines health promotion, remote oral examination, triage and the development of treatment plans would improve oral health across the community.

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