

# Virtual Dental Care - Pediatric Teledentistry

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## ABSTRACT

Teledentistry falls under virtual dental care where use of virtual communication is in between dentist and the patient to provide dental care and education to patients. Patients receive virtual examinations and are provided consultation, diagnosis, treatment planning, guidance, transmission of dental information and education via tele-communications. During this COVID-19 pandemic it has offered a solution to resume dental practice as a tool ensuring safety for all. Pediatric teledentistry helps by saving time, allowing child- dentist interaction before the visit and reducing stress for patients, guardians and dentists. Telescreening and teletriage can be implemented publically into routine dental practice and also as a triage-based emergency management strategy as it provides an effective compromise between limiting patient admission, ensuring their pain control and symptom relief.

Key words: Covid-19, pediatric dentistry, tele-dentistry.

## INTRODUCTION

Teledentistry is an innovative service in this digital age followed by the dentists to provide patient access to dental care and services through interactive audio, video or other electronic media for the purpose of diagnosis, consultation, treatment, and/or transfer of dental information to enhance care and education delivery,<sup>1</sup> rather than through direct face-to-face contact with any patient.

It is an upcoming valuable tool in the field of dentistry that combines telecommunication technology, digital imaging, and the internet to link healthcare professionals in rural areas or remote communities, thus bridging the rural urban divide.

## MODES OF USING TELEDENTISTRY

Communication can take place in the following ways:<sup>1</sup>

- a. Real-time consultation: It is a two way interactive

synchronous method which transfers information immediately from the patient's end to the dentist's end.

- b. Store and forward method: It is an asynchronous method which allows data to be stored in a local database to be forwarded as needed.
- c. Remote monitoring method: Here, the patients are monitored at a distance and can be either hospital based or home based.
- d. Near real time consultation: It is a new technology that allows providers to see exactly how they're performing during the call or shortly thereafter, ensuring the best possible consultation.

## COMPONENTS OF TELEDENTISTRY

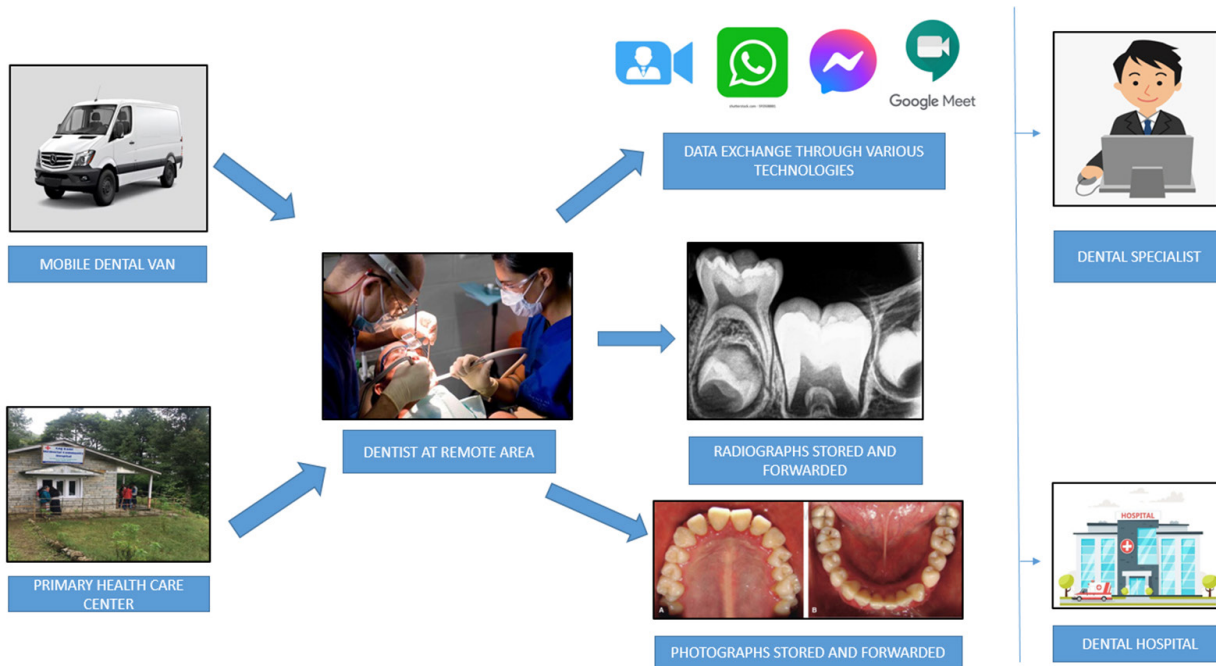
- i. Teleconsultation- Patients or healthcare workers seeks consultation from dental specialists. Study has shown it being a valuable tool even for the consultation of patients who are physically and intellectually challenged.<sup>2</sup>
- ii. Telediagnosis- Telediagnosis makes use of technology to exchange images and clinical data to make diagnosis of oral lesion. Studies have well advocated the use of smartphones for detection in dental caries,<sup>3</sup> as a reliable adjunct for screening of oral potentially

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**Figure 1.** Teledentistry in Dental Education.

malignant lesions<sup>4</sup> and by dental photography reducing the need of close clinical examinations.<sup>5</sup>

- iii. **Teletriage-** Involves use of smartphone by specialists for the safe, appropriate and timely evaluation of patient symptoms. Study has shown its used for remote assessment of school children and prioritizing those requiring dental care without unnecessary travel.<sup>6</sup>
- iv. **Telemonitoring-**The use of telemonitoring can replace the frequent physical visits by virtual visits for regular monitoring of treatment outcomes and disease progression.

### TELEDENTISTRY IN PEDIATRIC DENTISTRY

It is particularly well suited for children and is a valuable tool in pediatric dentistry. Teledentistry examination when conducted in a familiar environment, rather than a clinical environment, results in children being more enthusiastic, co-operative and less anxious. During this pandemic, parents and children at home can consult the dentist about oral health education and any dental emergency if present through instant messaging applications like - WhatsApp, Telegram, SMS, Messenger and video-calling applications (Google Meet, Skype, Facetime).

Mobile hygiene programs at schools and clinics are an effective way of increasing the range of healthcare services. The idea of “forward triage” was conceived to get grip of the crisis situation in the times of pandemics, by reducing the workload of the healthcare givers by filtering of the unnecessary patient visits to the dental settings.<sup>6</sup> It’s also been used in patients with intellectual and developmental disabilities which has shown the benefits of new technology use to access and utilize dental care.<sup>2</sup>

For pediatric patients especially in rural areas, it would reduce the cost of treatment and the need to travel to a specialist, because their problems are previously identified and planned via teledentistry. Study has demonstrated that the intraoral camera is a practicable and cost-effective alternative to a visual oral examination for caries screening, especially in early childhood caries, in preschool children attending childcare centers.<sup>7</sup>

### TELEDENTISTRY IN DENTAL EDUCATION

It helps in delivering long distance clinical training and continuing education. Dentists and health workers at remote areas can communicate with specialists for guidance during the clinical procedure through various technologies and can even consult for any diagnostic or treatment planning decisions (Figure 1).

It is found to be comparable to real-time consultations in areas with limited access to facilities, in school children and in long-term healthcare facilities.<sup>2</sup>

Due to the pandemic, as schools have shifted to online classes, online sessions can be taken by dentists or healthcare workers for children and teachers regarding oral health awareness. Dental students have also shifted to online learning in this era. If possible effectiveness in implementing dental virtual simulation in preclinical and clinical courses during pandemics could be a leap at this time of need in education sector.<sup>1</sup>

### TELEDENTISTRY DURING COVID-19 PANDEMIC

With simple tools like smartphones and laptop webcams, dentists could see the most vulnerable dental patients safely from their homes thereby eliminating their risk of infection while hospitals are providing only elective surgeries and treatments during COVID-19 pandemic.<sup>1</sup> It's use by dentists to triage dental emergency calls has shown elimination of unnecessary exposure during this corona virus outbreak and still staying in touch with the current patients, providing and improving quality of dental care.<sup>8</sup>

### MOBILE APPLICATIONS IN TELEDENTISTRY

One of the easiest and fastest way of teledentistry is by the use of mobiles. Mobile applications include a nationwide advocated application for accessibility of appointments, clinical data, dental advice and education.<sup>3</sup> The mobile application available in various smart phones has let dentists collect information in terms of videos and photos from patients in order to perform triage, allowing paperless intake of patient's data, outgoing appointment reminders and the ability for patients to contact the dentist via text messages. It offers remote consultations by combining expert systems via smartphones to allow healthcare professionals to screen patients' oral conditions, provide treatment recommendations and appointment scheduling.

### LEGAL AND ETHICAL ISSUES IN TELEDENTISTRY

The medico-legal and copyright issues have to be considered.<sup>1</sup> Proper informed consent should be taken from the patients and informed about the inaccuracy in

terms of diagnosis or treatment as a result of failure in technologies involved in its practice.<sup>9</sup> Legal issues arise in terms of transfer of medical histories, fraudulent alteration of records, maintenance of security during internet commerce, internet fraud and general security issues of electronic information stored in computers.

### CHALLENGES

Dentist -The lack of acceptance by dentist for teledentistry can be due to dentist being impervious to new skills regarding newer technology, lacking training and absence of technical support and expertise in this technological field.

Patients -Due to the lack of face-to-face communication, patients may feel the inadequacy of proper communication of their problems to their dentists and they may hesitate to adapt to virtual treatment modalities.

### TELEDENTISTRY IN NEPAL

Telemedicine has been adopted and is used increasingly in patient care but the dental profession is still in the relatively early stages of utilizing technology in similar ways.<sup>2</sup> Teledentistry has now become a valuable tool in the field of dentistry in Nepal during this COVID-19. Many organizations, hospitals and private clinics have started using it for providing healthcare services.

One of the recent study in Nepal during the pandemic lockdown showed that nearly 58% of the dentists had done virtual consultation only where most common dental emergencies were dental pain and swelling.<sup>10</sup>

### LIMITATIONS OF TELEDENTISTRY

Challenges include inadequate and expensive infrastructure, difficulty in identification or getting exact history as patients might hide information, inability to perform treatment in a virtual consultation and payment issues while providing teleconsultation.<sup>8</sup>

### SUMMARY

Dentistry is an important part of our healthcare system and in this digital era pediatric teledentistry can be incorporated into routine dental practice by pediatric dentists training themselves and their team in this technical field. During the current pandemic situation it is a valuable tool for

servicing the people in need to supplement the existing compromised dental system. An important challenge for future would be to ensure that it is maintained in a community for a long run that is sufficient to achieve the stated goals, especially in the field of pediatric dentistry.

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**Conflict of Interest:** None

INAPD

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