




IJCRR  
Section: Healthcare  
ISI Impact Factor  
(2021-22): 2.176  
IC Value (2020): 91.47  
SJIF (2020) = 7.893  
  
Copyright@IJCRR

# Assess the Parameters of Teledentistry and its Acceptance Among Dental Clinicians

Rehmatullah Kandhro<sup>1</sup>, Khalida Naz Memon<sup>2</sup>, Jazib Memon<sup>3</sup>, Tahera Ayub<sup>4</sup>,  
Naheed Najmi<sup>5</sup>, Yousuf Ahmed Qureshi<sup>6</sup>

<sup>1</sup>MSc, Community Dentistry Department, Liaquat University of Medical & Health Sciences, Jamshoro; <sup>2</sup>PhD, Department of Community Medicine & Public Health Sciences, Liaquat University of Medical & Health Sciences, Jamshoro; <sup>3</sup>Lecturer Operative Dentistry Department, Liaquat University of Medical & Health Sciences, Jamshoro; <sup>4</sup>Professor of Oral and Maxillofacial Surgery, Liaquat College of Medicine and Dentistry, Karachi; <sup>5</sup>Associate Professor Operative Dentistry Department, Liaquat College of Medicine and Dentistry, Karachi; <sup>6</sup>4th year Medical Student, Ziauddin University, Karachi.

## ABSTRACT

**Introduction:** Teledentistry can be illustrated as the remote course of action of understanding, treatment through the technique for information advancement as opposed to coordinating contact with any patient(s) included.

**Objective:** This review was organized to assess the knowledge and parameters of teledentistry of the dentists in Pakistan concerning teledentistry as an emerging implement.

**Methodology:** Descriptive Cross-sectional study was conducted among dentists working in Pakistan, by convenience sampling technique. And the data analysis was done on SPSS version 23. A Chi-Square test was used to control confounders and assess the relation of dentist response with respect to concerning age, gender and other variables

**Results:** Our participants have a high level of data with regard to teledentistry (85%) and they believe it's a useful tool to be taken in pandemic situations (84.8%).

**Conclusion:** In the present research, it was observed that most of the dental staff have adequate information in regard to teledentistry and they have highly obliged this gadget in curse conditions.

**Key Words:** Teledentistry, Telemedicine, Dentists, Dental supervision, Modern gadget, COVID-19

## INTRODUCTION

Teledentistry can be marked as the remote arrangement of dental consideration, counsel, or treatment through the mode of information technology as opposed to direct contact with any patient.<sup>1</sup>

The expression "Telemedicine" truly signifies "recuperating from separation". As indicated by WHO, the term telemedicine can be characterized as: "The conveyance of social insurance administrations, where separation is a basic factor, by all medicinal services experts utilizing data and correspondence innovations for the trading of legitimate data for finding, treatment and avoidance of ailment and wounds, research and assessment and for the proceeding with the training of human services suppliers, all in light of a legitimate concern for propelling the strength of people and their communities."<sup>3,4</sup>

With the amalgamation of dentistry and telemedicine, another field of study has been presented which is known as Teledentistry. It was started as a service undertaking to permit correspondence between dental experts over huge separations just as to furnish continuing with dental preparation.<sup>5</sup>

Teledentistry is a site for oral professionals that uses electronic media to allow dental specialists to converse with patients from remote zones. It includes various applications not just in a city set up where a patient under unbelievable dental desolation or in a condition of dental crisis requires to see a dental power yet furthermore what's more, in common spaces where money is a remarkable worry for individuals living there as it can portray a critical obstruction to scan for a treatment.<sup>6,7</sup>

Teledentistry can address these issues by basically checking into the web page on the web and getting the opportunity to

### Corresponding Author:

Dr. Rehmatullah Kandhro, Liaquat University of Medical & Health Sciences, Jamshoro.

Email: [drjani34@gmail.com](mailto:drjani34@gmail.com)

ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 14.04.2022

Revised: 04.05.2022

Accepted: 23.05.2022

Published: 03.06.2022

ease right away. Teledentistry approaches may hold the probability to address a colossal number of the issues identified with getting the chance to, cost, capacity, and the possibility of a dental idea.<sup>8-10</sup>

The web is the establishment of existing frameworks of teledentistry, being present-day and brisk, just as readied to transmit various measures of information.<sup>11</sup>

Correspondence and data advances used identified with the internet have become a central bit of insightful life in schools. Electronic teledentistry instruction engages under-studies to pick themselves the spot, time, and technique for learning.<sup>12</sup>

In continuing with capable dental training, present-day internet systems in like manner offer online videoconferencing, broadcasting exercises, and online instructional classes. Even though email remains a well-known system for store-and-forward conversation with limited data security, videoconferencing is so far a standard procedure for continuous counsel.<sup>13</sup>

With the quick development of cell phone innovation, the use of cell phones to accomplish and move pictures for the screening of dental conveys is incredibly expanded. The zoom and blaze highlights of cell phone cameras permit simpler catching of extra-oral just as intra-oral prints. The openness and compactness of cell phones give proficient intention to catching views in a brief timeframe.<sup>14,15</sup>

This article aims to assess the knowledge, parameters, and aspects of teledentistry among dental experts because deformities are increasing day by day in an era of pandemics (covid-19).

The primary work process of teledentistry includes the accompanying advances:

- o Capturing of pictures from cell phones.
- o Transmission of pictures from cell phone application legitimately to a protected framework.
- o Data recovery utilizing client ID and passwords.
- o Dental pictures are remotely inspected by the dentists.
- o Bi-directional correspondence between a dental expert and a patient.
- o Improve findings, systematize, treatment, lessen the time and arrangement of patients.
- o Easy access to dental healthcare in remote areas, where there is less number of experts and specialists.

### Objective:

Our research aims to evaluate parameters associated with teledentistry and its use and clinician acceptability of this modernized tool.

### Methodology:

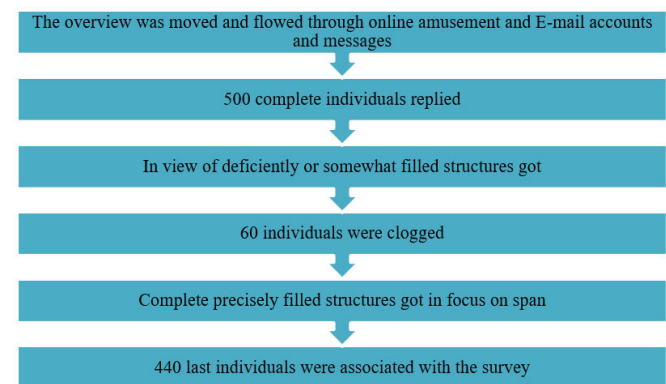
**Study setting:** Dental surgeons operating in Pakistan.

**Study Design:** Cross-sectional study

**Duration of study:** 2 weeks i.e. from 25<sup>th</sup> March 2022 to 8<sup>th</sup> April 2022.

**Study population, sample size & sampling technique:** Four hundred forty dental professionals were attended by convenience sampling

**Data collection method, variables & analysis:** The dental experts were drawn closer to complete the overview. The completed reviews were assembled and quantifiably researched with IBM SPSS variation 23 programs. Other than registering frequencies and rates, the collusion among factors was sought after by assuming the Pearson Chi-Square test to perceive differentiates appropriately for different variables with the level of significance set at  $p > 0.05$ . Separated from socio-segment factors, dental specialists' level of familiarity and expedient concerning teledentistry were recorded on a pre-validated questionnaire. Focus on people fuses subject matter experts, specialists, general dental specialists who work in Pakistan between some time of 24-50 years, and the individuals who didn't consent, residence officials, undergraduate students were blocked from the review.



**Figure 1:** Outflux of representatives enlistment.

## RESULTS

Five hundred dental experts were called to procure them outright comments of a respected figure of subjects i.e.440. The consistency scale was assumed as 88%.

Participants had a high phase of data (85%) considering teledentistry. We didn't decide on a solitary insignificant alliance between the period of dental specialists and their misgivings along gesture teledentistry ( $p \leq 0.01$ )

**Table 1: Profile of Subjects According To Demographic Data**

Profile	Attributes	Frequencies (%)
Age	24-30 years	153 (34.8)
	31-37 years	127 (28.9)
	38-42 years	121 (27.5)
	43-45 years	16 (3.6)
	46-50 years	23 (5.2)
Gender	Males	280 (63.6)
	Females	160 (36.4)
Designation	General Dentists	190 (43.2)
	Consultants/Specialists	250 (56.8)
Educational Status	Graduate	158 (35.9)
	Masters	197 (44.8)
	FCPS	70 (15.9)
	PhD	15 (3.4)

**Table 2: Responses and Knowledge Concerning Teledentistry**

Questions	Yes (%)	No (%)	p-value
Are you attentive to teledentistry?	85	15	≤.000
Does teledentistry assists to talk with a specialist about explicit patient's trouble?	80.2	19.8	≤.000
Can you admit that it is great for dental training over the web?	76.5	23.5	≤.000
Is it helpful in working on the admittance to oral medical care in curse fates?	84.8	15.2	≤.000
Does teledentistry abet in depreciating values for the dental practices?	75.7	24.3	≤.000
Do you feel that teledentistry can build the openness of the experts to rustic networks for their dental necessities?	79.8	20.2	≤.005
Does teledentistry expedite comprting the patient's oral wellbeing?	89.5	10.5	≤.001
Do you conclude that tel-edentistry is an advantageous type of oral medical services conveyance that makes dental assessment simpler?	84.1	15.9	≤.000
Can you depict that teledentistry extricates time for the dentists?	82.5	17.5	≤.000

## DISCUSSION

The current cross-sectional review unfastened a subject that procured reflective concern conforming to potent

enhancement in dentistry (teledentistry) among dental specialists in Pakistan.<sup>16</sup>

Considering the present circumstances of the world during the Covid-19 pandemic, when most of the world is in a state of lockdown/limited mobility, services like e-dentistry give speedy help to intense and painful conditions through consultations given over the phone.<sup>17</sup>

It is not a caprice strange to humankind and has been opening from the time of 1994, yet there have been enormous unique headways throughout the years in the field of dentistry. Conveying oral medical services to the patients has drastically been affected during the pandemic, with dentistry considered as an exceptionally unsound calling in alive contexts.

In the flow of COVID-19 Teledentistry is the main solid method to dispense dialogue and cure, employing electronic bits.<sup>18</sup>

Teledentistry permits significant reserve correspondence by keeping away from the individual to person connection, noticing social removal, allowing the trade of clinical data and pictures, and functioning with distant dental consideration, patients' schooling, and direction which is suggested by medical care specialists across the globe.<sup>19</sup>

The existing composition spotlights the overtone of teledentistry. It hold subsets, for instance, "teleconsultation, telediagnosis, telemonitoring, and teletriage", aside from holding significant capacities pertinent to dentistry. The perception emerging from our information is that dental specialists cherish teledentistry for its capacity to work on persistent consideration and improve oral wellbeing rehearses, which is consistent with a comparable review led in Canada, USA, where most of the dental specialists were on the side of the utilization of teledentistry in better medical care conveyance.<sup>20</sup>

In an ongoing exploration by "Yang et al. for an arrangement of well-being administrations during the Covid - 19 episode, it was seen that all the 48 clinics which were part of the research, suspended general non-critical treatment while giving critical dental administrations and 33 (68 %) medical clinics offered free online expert counsels for deciding if the condition required crisis treatment and gave home dental and oral consideration guidance".<sup>21</sup>

A study about teledentistry in India saw that 58% of dental specialists concurred with the explanation that teledentistry is great for dental training furthermore, preparation over the web. From our perspective, 63.4% of dental specialists tackle that teledentistry assists in lessening tools for dental practices. 59.7% of respondents in a review completed in India concurred teledentistry abates charges for dental procedures. Teledentistry can profit Pakistan's human services framework as far as preventive consideration and illness treatment is concerned.

Although telemedicine is gradually picking up acknowledgment among the individuals of Pakistan just as the experts.

To appraise the current state and efficacy of teledentistry in Pakistan and its acceptance among patients and dental experts, the accompanying research is led.<sup>22-25</sup>

## CONCLUSION

The present exploration shows that notwithstanding the vast majority of the members having satisfactory information about the expression “teledentistry”, they communicated positive possibilities regarding its utilization.

It is needed to upgrade the information for and advance its use in this season of COVID-19, and, surprisingly, later. Planning new strategies and dental instruction intents is enforced. Teledentistry might keep on being utilized as a method for meeting and giving simple admittance to dental experts and patients.

In ongoing potential outcomes, it would be attainable that distant mechanical operations would be worked on due to teledentistry. Thusly, it might be said that teledentistry is a bracing and refined element with incessant potency.

## ACKNOWLEDGEMENT:

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

### Source of funding:

No any financial support was taken.

### Conflict of Interest:

There is no conflict of interest from any author.

### Authors' Contribution:

**Rehmatullah Kandhro:** Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Substantial contribution to the designing, conceptualization, analysis, and interpretation of data for the article.

**Khalida Naz Memon:** Writing and editing of the article. Have contributions in conceptualizing the topic. Validation, Supervision and providing the final approval for the publication of the content.

**Jazib Memon:** Substantial contribution to the designing of the work.

**Naheed Najmi and Yousuf Ahmed:** Revised it critically for important intellectual content and final approval for the publication.

### Ethical Approval:

Ethical approval letter (NO.LUMHS/REC/-73) was taken by the Institutional Research Ethics Committee by Liaquat University Of Medical and Health Sciences Jamshoro on dated 24-03-2022

## REFERENCES

1. Maret D, Peters OA, Auria JP, Savall F, Vigaros E. Smartphone oral self-photography in teledentistry: Recommendations for the patient. *J Telemed Telecare*. 2021 Jun 23;1357633X211028513.
2. Nadella S, Wang TT, Bear A, Panchal N. Do Medical Insurance Companies Reimburse Telemedicine Office Visits the Same as In-Person Office Visits in an Academic Oral and Maxillofacial Surgeon Setting?. *J. Oral Maxillofac. Surg*. 2021 Dec 1;79(12):2398-403.
3. Al-Izzi T, Breeze J, Elledge R. Following COVID-19 clinicians now overwhelmingly accept virtual clinics in Oral and Maxillofacial Surgery. *Br. J. Oral Maxillofac. Surg*. 2020 Dec 1;58(10):e290-5.
4. Motulsky A, Liang M, Moreault MP, Borycki E, Kushniruk A, Sicotte C. Evaluation of a nationwide e-prescribing system. *InMEDINFO 2019: Health and Wellbeing e-Networks for All 2019* (pp. 714-718). IOS Press.
5. Kumaran NK, Salama Y, Karmakar BK. Surgeons' user experience of telemedicine in surgical consultations during the COVID-19 pandemic, with an emphasis on general surgical consultations. *The Annals of The Royal College of Surgeons of England*. 2021 Sep;103(8):561-8.
6. Maspero C, Abate A, Cavagnetto D, El Morsi M, Fama A, Farronato M. Available technologies, applications and benefits of teleorthodontics. A literature review and possible applications during the COVID-19 pandemic. *J. Clin. Med*. 2020 Jun;9(6):1891.
7. Hansa I, Semaan SJ, Vaid NR. Clinical outcomes and patient perspectives of Dental Monitoring® GoLive® with Invisalign®—a retrospective cohort study. *Progress in Orthodontics*. 2020 Dec;21(1):1-7.
8. Tynan A, Deeth L, McKenzie D, Bourke C, Stenhouse S, Pitt J et al. Integrated approach to oral health in aged care facilities using oral health practitioners and teledentistry in rural Queensland. *Aust J Rural Health*. 2018 Aug;26(4):290-4.
9. Aquilanti L, Santarelli A, Mascitti M, Procaccini M, Rappelli G. Dental care access and the elderly: What is the role of teledentistry? A systematic review. *Int. J. Environ. Res. Public Health*. 2020 Jan;17(23):9053.
10. Fernández CE, Maturana CA, Coloma SI, Carrasco-Labra A, Giacaman RA. Teledentistry and mHealth for promotion and prevention of oral health: a systematic review and meta-analysis. *J. Dent. Res*. 2021 Aug;100(9):914-27.
11. Deshpande S, Patil D, Dhokar A, Bhanushali P, Katge F. Tele-dentistry: A Boon Amidst COVID-19 Lockdown—A Narrative Review. *Int. J. Telemed. Appl*. 2021 Feb 16;2021.
12. Ben-Omran MO, Livinski AA, Kopycka-Kedzierawski DT, Boroumand S, Williams D, Weatherspoon DJ et al. The use of

- teledentistry in facilitating oral health for older adults: A scoping review. *J. Am. Dent. Assoc.* 2021 Dec 1;152(12):998-1011.
13. Kumar G, Rehman F, Al-Muzian L, Farsi D, Hiremath S. Global scenario of teledentistry during COVID-19 pandemic: An insight. *Int. J. Clin. Pediatr. Dent.* 2021 May;14(3):426.
  14. Al-Shammery D, Alqhtani N, Alotaibi AN, AlSharidah M, AlShehri K, AlShamrani A. Contributions and Concerns about the Use of Teledentistry in Clinical Orthodontics. *Oral health & preventive dentistry.* 2021 Jan 1;19(1):465-9.
  15. Subhan R, Ismail WA, Musharraf S, Khan M, Hafeez R, Alam MK. Teledentistry as a Supportive Tool for Dentists in Pakistan. *BioMed Research International.* 2021 Sep 8;2021.
  16. Raucci-Neto W, de Souza Pereira M, Cerqueira NM, Louzada VG, de Castro Raucci LM, et al. Knowledge, perception, and experience of dentists about teledentistry. *Int. Dent. J.* 2021 Sep 17.
  17. Santana LA, Santos MA, Albuquerque HI, Costa SF, Rezende-Silva E, Gercina AC et al. Teledentistry in Brazil: a viable alternative during COVID-19 pandemic. *Revista Brasileira de Epidemiologia.* 2020 Aug 19;23:e200082.
  18. Crawford E, Taylor N. The effective use of an e-dentistry service during the COVID-19 crisis. *J. Orthod.* 2020 Dec;47(4):330-7.
  19. Deshpande S, Patil D, Dhokar A, Bhanushali P, Katge F. Teledentistry: A Boon Amidst COVID-19 Lockdown—A Narrative Review. *Int. J. Telemed. Appl.* 2021 Feb 16;2021.
  20. Ben-Omran MO, Livinski AA, Kopycka-Kedzierawski DT, Boroumand S, Williams D, Weatherspoon DJ, et al. The use of teledentistry in facilitating oral health for older adults: A scoping review. *J. Am. Dent. Assoc.* 2021 Dec 1;152(12):998-1011.
  21. Yang Y, Zhou Y, Liu X, Tan J. Health services provision of 48 public tertiary dental hospitals during the COVID-19 epidemic in China. *Clinical oral investigations.* 2020 May;24(5):1861-4.
  22. Watfa MO, Bernfeld NM, Oren D, Shani T, Zigran A, Sela E et al. Rapid implementation of teledentistry during the Covid-19 lockdown. *Advances in Oral and Maxillofacial Surgery.* 2021 Apr 1;2:100031.
  23. Barca I, Novembre D, Giofrè E, Caruso D, Cordaro R, Kallaverja E et al. Telemedicine in oral and maxillo-facial surgery: an effective alternative in post COVID-19 pandemic. *Int. J. Environ. Res. Public Health* 2020 Jan;17(20):7365.
  24. Moon HS, Wang TT, Rajasekaran K, Brewster R, Shanti RM, Panchal N. Optimizing telemedicine encounters for oral and maxillofacial surgeons during the COVID-19 pandemic. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology.* 2021 Feb 1;131(2):166-72.
  25. Raucci-Neto W, de Souza Pereira M, Cerqueira NM, Louzada VG, de Castro Raucci LM, Leoni GB. Knowledge, perception, and experience of dentists about teledentistry. *Int. Dent. J.* 2021 Sep 17.