Orginal Article

Assessment of Knowledge, Attitude and Practice Regarding Tele-Dentistry among Oral-Health Professionals of Kist Medical College and Teaching Hospital

Surendra Kumar Acharya[1], Aastha Guragain[2], Mamata Rai[2], Bipulesh Goit[1], Steffi Maharjan[4], Shreeja Pradhan[4]

[1] Department of OMFS, KIST Medical College and Teaching Hospital, Imadol, Lalitpur, Nepal.
[2] Msc Nursing, Lecturer, Manmohan Institute of Health Sciences, Soaltee Mode, Kathmandu, Nepal.

Article History

Recived: : 26 January, 2023
Accepted: 1 July, 2023
Published: 31 July, 2023

Funding Sources: None

Conflict of Interest: None

Online Access

DOI:

https://doi.org/10.61122/jkistmc259

Correspondence

Surendra Kumar Acharya
Lecturer, KIST Medical College and Teaching Hospital,
Imadol, Lalitpur, Nepal
Email: surendraacharya320@gmail.com

Citation: Acharya SK, Guragain A, Rai M, Goit B, Maharjan S, Pradhan S. Assessment of Knowledge, Attitude and Practice Regarding Tele-Dentistry among Oral-Health Professionals of Kist Medical College and Teaching Hospital. J. KIST Med. Col. 5(10):33-38.

Abstract

Introduction: It is the branch of Telehealth which allows virtual communication between dental practitioner and patient overcoming the geographic remoteness and the urban rush hour. The main aim of this study is to access the knowledge, attitude and practice of Teledentistry among the oral health professionals of KIST Medical College and Teaching Hospital.

Methods: A cross-sectional descriptive study was carried out on 260 oral health professionals. The study was conducted at KIST Medical College and Teaching Hospital, Imadol, Nepalfrom December 2021 to October 2022 with IEC No: 2078/79/51. A set of 20 close ended questionnaires were administered which were pretested before use. The data collection was by both social media (soft copy) and hard copy which were compiled in a systemic manner and analyzed in terms of frequency (yes/no).

Results: There was a 100% response rate. Majority of age group was 20-25 years which was 80.80%. 84.60% were females and 14.40 % were males. Regarding qualification 68.50 % were BDS Students, 15.40 % were Interns, 7.70 % were Faculties, 6.20% were Dental Surgeons, and 2.30 % were Dental Hygienist. Knowledge about Teledentistry was 81.86% which was considered as good, 70.50% showed good attitude and regarding practice 81.66 % gave positive response on application of Teledentistry.

Conclusion: Therefore Teledentistry has not only contributed to cost and time but also made dentistry more approachable in developing countries like Nepal where there are geographic barriers along with economic and educational challenges.

Keywords: *Attitude, knowledge, oral health professionals, practice, teledentistry*

Introduction

Teledentistry is the use of electronic information, imaging and communication technologies, including interactive audio, video, data communications as well as store and forward technologies, to provide and support dental care delivery, diagnosis, consultation, treatment, transfer of dental information and education.[1]The term Teledentistry" was first used in 1997, when Cook defined it asthe practice of using video-conferencing technologies to diagnose and provide advice about treatment over a distance.[2] Rocca MA

in 1999 published a study, "the evolution of a Teledentistry system within the Department of Defense. The study says, The birth of Teledentistry goes way back to 1994 AD as a subspecialist field of telemedicine with a military project of the united states army (U.S. Army's Total Dental Access Project), aiming to improve patient care, dental education, and effectuation of the communication between dentists and dental laboratories. On that study, Teledentistry was found to reduce the overall cost and provide better care for patients than the traditional referral process, and also provide more complete information for data analysis.[3,4] It is derived from the Greek word "Tele" meaning distance and Latin word "medri" meaning to heal.[5] Health care is being changed dramatically with the era of computers and telecommunication. Most dentists and dental educators are unaware that Teledentistry can be used not only for increased access to dental care, but also for advanced dental education.[6] It provides an opportunity to supplement traditional teaching methods in dental education, and will provide new opportunities for dental students and dentists.[7] It enables the specialist located many miles away to make a diagnosis and recommend treatment options and/or referral.[3] Mobile Mouth Screening Anywhere (MeMoSA®) to facilitate early detection of oral cancer found it to be beneficial for patients with limited access to specialists.[7] Teledentistry reflects a broader, changing healthcare landscape that is moving towards innovation, integration and convenient care.[4] In today's circumstances of ongoing COVID-19 pandemic, the main aim is to avoid person to person contact.[8] As dental treatment invariably involves close inspection, examination, diagnostic and therapeutic interventions of the naso-oropharyngeal region, dental professionals are most susceptible to get infected with coronavirus.[9] Especially during this pandemic situation, the technology has embraced various sectors like health, education, corporate world etc. and like Telehealth, Teledentistry is flourishing too. Teledentistry is proof that the dental industry is embracing innovation too. Despite the extensive use of Telemedical applications in healthcare, many Dentists are unfortunately ignorant of the nature of Teledentistry, the benefits behind its use, or its adaption/application in routine practice.[10] With modern updated devices and tools, Teledentistry can be an effective way to prevent disruption of dental education and it can be utilized in continuing the dental educational process in this critical time of the COVID-19 outbreak.[11]

The objective of this study was to access knowledge, attitude and practice of oral health among health professionals.

Methods

The study was conducted at KIST Medical College and Teaching Hospital, Imadol, Nepal from December 2021 to October 2022 with IEC No: 2078/79/51. Participants consent was taken along with proforma. The language was English but no native language translation done as all the participants were educated.

A descriptive cross-sectional study was conducted among 260 oral health professionals, including Faculties, Residents, Dental Surgeons, Dental Hygienists, Interns, and BDS Students. All the participants who were willing to take part in the study were considered in the inclusion criteria. The exclusion criteria includes those did not give consent to participate in the study.

The sample size was calculated using the formula N= z2 p*q/l2, which equals to 137.Where,

N	Sample size
Z	1.96 at 5% level of significance (tabulated value)
P	Prevalence according to previous study no other study has been done till now, so its 0.5.
Q	Q= 1-p =0.5
L^2	Margin of error

A structured, self-administered, and close ended questionnaire written in English language was distributed among 260 oral health professionals from the Dental Department of KIST Medical College and Teaching Hospital. The questionnaire comprised of 20 close ended questions with yes or no responses and are divided into 3 groups: Socio-demographic details, questions related to knowledge of Teledentistry and questions related to access the attitude and practice regarding Teledentistry.

Out of 20 questionnaires among which 5 questions were about knowledge and 7 questions were about attitude and 8 questions were about practice.

The standard questionnaire tool was used and permission from authors was taken. The questionnaire selected have previously checked validity and reliability. Validity was checked in 10% of total sample size and that was excluded from total sample population. The data were collected and compiled, arranged in a systemic manner. The descriptive statistics was done using IBM SPSS version 23.

Results

There was a 100% response rate. Regarding age, majority (80.80%.) of age group was 20-25 years Regarding gender, 84.60% were females and 14.40 % were males. Regarding qualification 68.50 % were BDS Students, 15.40 % were Interns, 7.70 % were Faculties, 6.20% were dental Surgeons, and 2.30 % were Dental Hygienist. (Table 1)

Out of 260 participants, 65.2% of the oral health professionals had demonstrated good knowledge, attitude and practice of Teledentistry. The total number of questions was 20, and the final score was calculated and then labeled according to the percentage (out of 20) of correct

responses (yes) as good (>80%), moderate (60-80%), and poor (<60%). Knowledge about Teledentistry was 81.86% which was considered as good, 70.50% showed good attitude and regarding practice 81.66% gave positive response on application of Teledentistry for clinical practice, remote access, online consultation, expert consultation, solving the patient specific problems, patients access to health care and formulation of policies from government side. 78.5% heard about Teledentistry, 90% agreed on will it support a government initiative whereby patients could obtain advice on treatment need from a central facility such as PHC connected via Teledentistry?Knowledge of oral health professionals about Teledentistry was ranges from 67.70-97.70%. (Table 2, 3, 4) 67.70% agreed on can Teledentistry be applied in any branch of dentistry? And 97.70 agreed on is Teledentistry about the practice of use of computers, Internet, and technologies to diagnosis and provide advice about treatment over a distance? Regarding attitude towards Teledentistry 30.80%-84.60% oral health professionals had positive attitude. Regarding practice 53.10%-93.10 % of oral health professionals agreed on application of Teledentistry in clinical practice. Out of that 53.10% respond yes to question; can Teledentistry will be able to monitor your patient`s condition well and 93.10% respond yes to question; does Teledentistry helps to consult with an expert about specific patient's problem? (Table 2, 3, 4)

Table 1: Profile of participants.

Items	Category	Number	Percentage
Age in years	15-20	14.0	5.40
	20-25	210	80.80
	25-30	14.0	5.40
	30-35	12.0	4.60
	35-40	6.0	2.30
	40-45	4.0	1.50
Gender	Male	40	15.40
	Female	220	84.60
Qualifications	Faculties	20	7.70
	Dental Surgeons	16	6.20
	Interns	40	15.40
	Dental Hygienist	06	2.30
	BDS Students(first year to final year)	178	68.50

Table 2: Knowledge about Teledentistry

Questions	Number	Percentage
Have you heard about teledentistry?		
Yes	204	78.5%
No	56	21.5%
Do you know what teledentistry is?		
Yes		
No		

Title:????

SN	Questions	Answers	Frequency	Percentage
1.	Have you heard about teledentistry?	Yes No Total	204 56 260	78.50 21.50 100
2.	Do you know what teledentistry is?	Yes No Total	178 82 260	68.50 31.50 100
3.	Is teledentistry about the practice of use of computers, Internet, and technologies to diagnosis and provide advice about treatment over a distance?	Yes No Total	254 06 260	97.70 2.30 100
4.	Can teledentistry be applied in any branch of dentistry?	Yes No Total	176 84 260	67.70 32.30 100
5.	In Nepal, major challenges in teledentistry are illiterates, population below the poverty line, and lack of infrastructure?	Yes No Total	252 08 260	96.90 3.1 100

Table 3: Attitude towards Teledentistry

SN	Questions	Answers	Frequency	Percentage
6.	Do you think that teledentistry is good for dental education and for training primary health-care dentists?	Yes No Total	210 50 260	80.80 19.20 100
7.	Do you think that teledentistry is a convenient form of oral health-care delivery that makes dental examination easier?	Yes No Total	170 90 260	65.40 34.6 100
8.	Do you think that teledentistry saves time for the dentist?	Yes No Total	214 46 260	82.30 17.70 100
9.	Do you think that teledentistry can increase accessibility of the specialists to rural and underserved communities for their dental needs?	Yes No Total	220 400 260	84.60 15.40 100
10.	Do you trust the teledentistry equipment to work?	Yes No Total	166 94 260	68.80 36.20 100
11.	Do you think that dental examinations are accurate via computers and intraoral camera as in the traditional office setting?	Yes No Total	80 180 260	30.80 69.20 100
12.	Do you think that teledentistry is a good tool for oral hygiene training?	Yes No Total	210 50 260	80.80 19.20 100

Table 4: Practice about Teledentistry

SN	Questions	Answers	Frequency	Percentage
13.	Does teledentistry helps to consult with an expert about specific patient's problem?	Yes No Total	242 18 260	93.10 6.90 100
14.	Does teledentistry helps to monitor the patient's oral health?	Yes No Total	192 68 260	73.80 26.20 100
15.	Is teledentistry useful in improving the access to oral healthcare?	Yes No Total	236 24 260	90.80 9.20 100
16.	Can teledentistry will be able to monitor your patient`s condition well	Yes No Total	138 122 260	53.10 46.90 100
17.	Teledentistry can be an addition to the regular care to which the dentists provide?	Yes No Total	240 20 260	92.30 7.69 100
18.	Does teledentistry can help in reducing costs for the dental practices?	Yes No Total	180 80 260	69.20 30.80 100
19.	Will it support a government initiative whereby patients could obtain advice on treatment need from a central facility such as PHC connected via teledentistry?	Yes No Total	234 26 260	90 10 100
20	In the future, will you practice teledentistry	Yes No Total	238 22 260	91.5 8.5 100

Discussion

A similar article was published where they investigated the use of mobile phones for patient diagnosis and treatment planning among children, where they found that Teledentistry could be a reliable tool for the initial diagnosis of caries.[12] An author conducted a research which stated that, "with smart phone camera technology improving significantly and widespread availability of the cellular networks, utilization of smartphone cameras in dental imaging has grown.[13] The potentials of Teledentistry need to be explored in India as there are many barriers for the rural population to access specialty dental care, such as geographic remoteness, poor or no public transportation, and poverty, leading to compromise on quality health care, resulting in complications.[9] A systemic review, which shows that Teledentistry has the ability to improve access to and delivery of oral health care at a relatively lower cost as well as supplementing traditional teaching methods in dental education.[14] The use of Teleconsultation in dentistry can be cost-saving when compared to a conventional consultation. Now a days dental care is being transformed by opportunities provided by technology and communication.[15] This has not only contributed to cost and time but also made dentistry more approachable in developing countries like Nepal where there are geographic barriers along with economic and educational challenges, Teledentistry can be a new hope to undeserving and socially disadvantaged people.[16] The most common type of Teledentistry application was education, followed by diagnosis, consultation and treatment. It offers new opportunities to improve oral health care by enhancing early diagnosis, facilitating timely treatment of oral diseases, and reducing isolation of practitioners through communication with peers and consultation with specialists.[17,18] Still, compared to medicine, Teledentistry is rarely used in everyday oral health practice. The interceptive orthodontic treatments provided through Teledentistry has been effective approach to reduce the severity of malocclusions in disadvantaged children.[19, 20] Teledentistry is most valuable tool for surgical planning, follow up, referral, online consultation, and patient's education.

Conclusion

With all the technological developments taking place in the field of Teledentistry, practitioners may eventually link up to virtual dental health clinics and an entirely new era of dentistry can be created. Knowledge of oral health professionals about Teledentistry was ranges from 67.70-97.70%. Regarding attitude towards Teledentistry; 30.80%-84.60% oral health professionals had positive attitude. Regarding practice; 53.10%-93.10% of oral health professionals agreed on application of Teledentistry in clinical practice.

However, a number of things have to be addressed before Teledentistry can rise to its peak. Further studies involving greater number of participants will be required to validate the various aspects of Teledentistry applications.

References

1. Rocca MA, Kudryk VL, Pajak JC, Morris T. The evolution of a Teledentistry system within the Department of Defense. American Medical Informatics Association. AMIA Symposium. 1999; 921.
2. Fricton J, Chen H. Using Teledentistry to improve access to dental care for the underserved. Dental Clinics. 2009 Jul 1; 53(3):537-48.
DOI: 10.1016/j.cden.2009.03.005
PMID: 19482128
3. Al-Khalifa KS, AlSheikh R. Teledentistry awareness among dental professionals in Saudi Arabia. PLoS One. 2020 Oct 15; 15(10):e0240825.
DOI: 10.1371/journal.pone.0240825
PMID: 33057381 PMCID: PMC7561132
4. Chen JW, Hobdell MH, Dunn K, Johnson KA, Zhang J. Teledentistry and its use in dental education. The Journal of the American Dental Association. 2003 Mar 1; 134(3):342-6.
DOI:10.14219/jada.archive.2003.0164
PMID: 12699048
5. Haron N, Zain RB, Ramanathan A, Abraham MT, Liew CS, Ng KG, Cheng LC, Husin RB, Chong SM, Thangavalu LA, Mat A. M-Health for early detection of oral cancer in low-and middle-income countries. Telemedicine and e-Health. 2020 Mar 1; 26(3):278-85.
DOI: 10.1089/tmj.2018.0285
PMID: 31081720
6. Ghai S. Teledentistry during COVID-19 pandemic. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2020 Sep 1; 14(5):933-5.
DOI: 10.1016/j.dsx.2020.06.029
PMID: 32593116 PMCID: PMC7297180
7. Estai M, et al. End-user acceptance of a cloud-based Teledentistry system and Android phone app for remote screening for oral diseases. Journal of telemedicine and Telecare. 2017 Jan; 23(1):44-52.
DOI: 10.1177/1357633X15621847
PMID: 26721829
8. Estai M, Kruger E, Tennant M, Bunt S, Kanagasingam Y. Challenges in the uptake of telemedicine in Dentistry. Rural and remote health. 2016 Dec 1; 16(4):1-5.
DOI:10.22605/RRH3915
PMID:27893947

9. Berndt J, Leone P, King G. Using Teledentistry to provide interceptive orthodontic services to disadvantaged children. American Journal of Orthodontics and Dentofacial Orthopedics. 2008 Nov 1; 134(5):700-6. DOI: 10.1016/j.ajodo.2007.12.023 PMID: 18984404

10. Farooq I, Ali S, Moheet IA, AlHumaid J. COVID-19 outbreak, disruption of dental education, and the role of Teledentistry. Pakistan Journal of Medical Sciences. 2020 Nov; 36(7):1726. DOI: 10.12669/pjms.36.7.3125

11. Nagarajappa R, et al. Teledentistry: Knowledge and attitudes among dentists in Udaipur, India. Oral Health Dent Manag. 2013 Sep; 12(502):2.

12. Daniel SJ, Wu L, Kumar S. Teledentistry: a systematic review of clinical outcomes, utilization and costs. American Dental Hygienists' Association. 2013 Dec 1; 87(6):345-52.

13. Tella AJ, Olanloye OM, Ibiyemi O. Potential of teledentistry in the delivery of oral health services in developing countries. Annals of Ibadan postgraduate medicine. 2019; 17(2):115-23.

14. Chen JW, Hobdell MH, Dunn K, Johnson KA, Zhang J. Teledentistry and its use in dental education. The Journal of the American Dental Association. 2003 Mar 1; 134(3):342-6. DOI: 10.14219/jada.archive.2003.0164 PMID: 12699048

15. Jampani ND, Nutalapati R, Dontula BS, Boyapati R. Applications of teledentistry: A literature review and update. Journal of International Society of Preventive & Community Dentistry. 2011 Jul; 1(2):37. DOI: 10.4103/2231-0762.97695 PMID: 24478952 PMCID: PMC3894070

16. Marino R, Ghanim A. Teledentistry: a systematic review of the literature. Journal of Telemedicine and Telecare. 2013 Jun; 19(4):179-83. DOI: 10.1177/1357633x13479704 PMID: 23512650

17. Marino R et al. Teleconsultation and telediagnosis for oral health assessment: an Australian perspective. Teledentistry. 2015:101-12. DOI: 10.1007/978-3-319-08973-7_10

18. Sultana SS, Chole RH, Adalja C, Patel P, Peter R. Knowledge, awareness and attitude among dentist and dental students about teledentistry. Journal of Advanced Health Sciences and Research. 2020 Jun; 1(1):17-24.

19. AlShaya MS, Assery MK, Pani SC. Reliability of mobile phone teledentistry in dental diagnosis and treatment planning in mixed dentition. Journal of telemedicine and telecare. 2020 Jan; 26(1-2):45-52. DOI: 10.1177/1357633X18793767 PMID:30134778

20. Pradhan D, Verma P, Sharma L, Khaitan T. Knowledge, awareness, and attitude regarding teledentistry among postgraduate dental students of Kanpur city, India: A questionnaire study. Journal of education and health promotion. 2019; 8.