

## Original Research

### Assessment of knowledge, attitude and practice regarding Tele-dentistry among oral-health professionals of KIST medical college and teaching hospital

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#### ABSTRACT:

**Background:** Tele-dentistry is the combination of dentistry along with the tele-communication and information technology. It is the branch of tele-health which allows virtual communication between dental practitioner and patient overcoming the geographic remoteness and the urban rush hour. It has also gained popularity by providing tele-education during covid 19-pandemic. **Aim:** The main aim of this study is to access the knowledge, awareness and practice of tele-dentistry among the oral health professionals of kist medical college and teaching hospital. **Methods:** A cross-sectional descriptive survey was carried out on total 211 oral health practitioners. The study was conducted by KIST Medical College and Teaching Hospital, Imadole, Nepal from December 2021 to January 2022 with IRC 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). **Result:** There was a 100% response rate. The age range was 15-45 years with a mean age of 27.78 years. **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. Teledentistry can be a new hope to underserving and socially disadvantaged people for fulfilling the demand and needs of population in the developing country.

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#### INTRODUCTION

Tele-dentistry 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.<sup>1</sup>The term Teledentistry" was first used in 1997, when Cook defined it as the practice of using video-conferencing technologies to diagnose and provide advice about treatment over a distance.<sup>2</sup>Rocca MA in 1999 published a study, "the evolution of a teledentistry system within the Department of Defense. The study says, The birth of tele-dentistry 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.<sup>3,4</sup>It is derived from the Greek word "Tele" meaning distance and Latin word "medri" meaning to heal.<sup>5</sup> 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.<sup>6</sup> It provides an opportunity to supplement traditional teaching methods in dental education, and will provide new opportunities for dental students

and dentists.<sup>7</sup> It enables the specialist located many miles away to make a diagnosis and recommend treatment options and/or referral.<sup>3</sup> Mobile Mouth Screening Anywhere (MeMoSA®) to facilitate early detection of oral cancer found it to be beneficial for patients with limited access to specialists.<sup>7</sup> Teledentistry reflects a broader, changing healthcare landscape that is moving towards innovation, integration and convenient care.<sup>4</sup> In today's circumstances of ongoing COVID-19 pandemic, the main aim is to avoid person-to-person contact.<sup>8</sup> 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 COVID-19 virus.<sup>9</sup> Especially during this pandemic situation, the technology has embraced various sectors like health, education, corporate world etc. and like tele health tele-dentistry is flourishing too. Teledentistry is proof that the dental industry is embracing innovation too. Despite the extensive use of tele medical 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.<sup>10</sup> 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.<sup>11</sup>

### OBJECTIVE OF THE STUDY

The objective of this study is to assess knowledge, attitude and practice among the oral health

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

### DATA COLLECTION AND ANALYSIS

A structured, self-administered, and close ended questionnaire written in English language was distributed among 211 oral health practitioners 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 three groups:

1. Socio-demographic details
2. Questions related to knowledge of tele-dentistry- 12 questions
3. Questions related to access the attitude and practice regarding tele dentistry-8 questions

The study was conducted between the time periods of November 2021 to December 2021. The data were

professionals of Kist medical college, Lalitpur, Nepal. However teledentistry should not only be a practice builder for the local dentist, but also has the potential for helping dentists better serve their patients while increasing their own knowledge. Teledentistry can also be used to assist general dentists with specialty work and improve services to underserved population with no or limited care. It has the assortment of use that includes; time saving and cost-effective service to both urban and rural areas, training general dentists and dental hygienists, and educating dental students (both graduates and post graduates) in case of new emerging pandemic condition.

### MATERIALS AND METHODS

The study was conducted by KIST Medical College and Teaching Hospital, Imadole, Nepal from December 2021 to January 2022 with IRC No: 2078/79/51.

### STUDY DESIGN AND STUDY POPULATION

A descriptive cross-sectional study was conducted among 130 oral health practitioners, including faculty members, residents, dental surgeons, hygienists, interns, and students of KIST medical college and teaching hospital. All the participants who are 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  $N = z^2 \frac{p \cdot q}{L^2}$ , which equals to 137.

collected and compiled, arranged in a systemic manner in google form and analysis was done using SPSS software.

### RESULTS

There was a 100% response rate. Total 130 oral health professionals with age ranges from 15- 45 years and mean age of 23.78 years were participated in the study. Of the total participants 110 were female and 20 were male. Majority of participants were BDS students and followed by BDS intern, faculties, dental surgeon and dental hygienist in descending order.

**Table 1: Knowledge of oral health professionals and students about teledentistry**

	<b>Total Professionals/students</b>	<b>Professionals/Students Know about Teledentistry?</b>	<b>Professional/ Students do not know about Teledentistry?</b>	<b>Percentage of Professionals/ Students know about Teledentistry</b>
<b>1.</b>	BDS Intern (Total No. 19)	20	–	100%
<b>2.</b>	Dental Surgeon (Total No. 07)	08	–	100%
<b>3.</b>	BDS Student (Total No. 90)	54	35	60%
<b>4.</b>	Faculty (Total No.10)	10		100%
<b>5.</b>	Hygienist (Total No. 3)	2	1	66.66

**Table-2 Knowledge about teledentistry**

<b>SN</b>	<b>Questions</b>	<b>Number</b>	<b>Percentage</b>
1.	Have you ever heard about teledentistry?		
	Yes	102	78.5%
	No	28	21.5%
2.	Do you know what teledentistry is?		
	Yes	89	68.5%
	No	41	31.5%
3.	Is teledentistry about the practice of use of computers, Internet, and technologies to diagnosis and provide advice about treatment over a distance?		
	Yes	127	97.7%
	No	3	2.3%
4.	Does teledentistry helps to consult with an expert about specific patient's problem?		
	Yes	121	93.1%
	No	9	6.9%
5.	Do you think that teledentistry is good for dental education and for training primary health-care dentists?		
	Yes	105	80.8%
	No	25	19.2%
6.	Does teledentistry helps to monitor the patient's oral health?		
	Yes	96	73.8%
	No	34	26.2%
7.	Can teledentistry be applied in any branch of dentistry?		
	Yes	88	67.7%
	No	42	32.3%
8.	Is teledentistry useful in improving the access to oral healthcare?		
	Yes	118	90.8%
	No	12	9.2%
9.	Do you think that teledentistry is a good tool for oral hygiene training?		
	Yes	105	80.8%
	No	25	19.2%
10.	Can teledentistry will be able to monitor your patient's condition well?		
	Yes	69	53.1%
	No	61	46.1%

11.	Do you think that dental examinations are accurate via computers and intraoral camera as in the traditional office setting? Yes No	40 90	30.8% 69.2%
12.	Do you think that teledentistry is a convenient form of oral health-care delivery that makes dental examination easier? Yes No	85 45	65.4% 34.6%

**Table-3 Attitude and practice about teledentistry**

SN	Questions	Number	Percentage
1.	Teledentistry can be an addition to the regular care to which the dentists provide? Yes No	121 9	93.1% 6.9%
2.	Does teledentistry can help in reducing costs for the dental practices? Yes No	90 40	69.2% 30.8%
3.	Do you think that teledentistry saves time for the dentist? Yes No	107 23	82.3% 17.7%
4.	Do you think that teledentistry can increase accessibility of the specialists to rural and underserved communities for their dental needs? Yes No	110 20	84.6% 15.4%
5.	In Nepal, major challenges in teledentistry are illiterates, population below the poverty line, and lack of infrastructure? Yes No	126 4	96.9% 3.1%
6.	Do you trust the teledentistry equipment to work? Yes No	83 47	63.8% 36.2%
7.	Will you support a government initiative whereby patients could obtain advice on treatment need from a central facility such as PHC connected via teledentistry? Yes No	117 13	90% 10%
8.	In the future, will you practice teledentistry? Yes No	119 11	91.5% 8.5%

Faculties, Dental Surgeons and BDS interns had 100% knowledge about teledentistry and dental students had 60 % and dental hygienist had 66.66% knowledge.

## 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.<sup>12</sup> 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."<sup>13</sup> The potentials of teledentistry need to be explored in Nepal 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.<sup>9</sup> 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.<sup>14</sup> The use of tele-consultation 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.<sup>15</sup> 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 underserving and socially disadvantaged people.<sup>16</sup> The most common type of teledentistry application was education, followed by diagnosis, consultation and treatment. Everyone related to dentistry should know the teledentistry, though oral health professionals like faculties, dental surgeon and intern have good knowledge about the topic however students and auxiliary less knowledge. Based on results the application of teledentistry is not only limited to patients care but also can be used in academics and research. Teledentistry 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.<sup>17,18</sup> 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.<sup>19,20</sup>

## CONCLUSION

All oral health professionals had good knowledge about teledentistry however practice and implementation was poor. Poor implementation may be due to lack of infrastructure, technology and unanswered medico legal aspect. 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. The future might also see distant telemedical control of robotized instruments in situations with long-term unavailability of dental care, e.g., during space flights, on transoceanic ships, and in various rural areas. The results achieved so far are very encouraging, setting the road signs for future investigations. 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 teledental applications.

## CONFLICT OF INTEREST

None

## FUNDING

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