



## Teledentistry: A Patient's Perspective

<sup>1</sup> Dr Shanthi Vanka, <sup>2</sup>Rawda Ayman Morsy, <sup>3</sup>Majd Dhafer Adraj, <sup>4</sup>Dr Sumaya Saleh Aljebali, <sup>5</sup>Hanadi Sulaiman Wazna, <sup>6</sup> Dr Othman Wali, <sup>7</sup> Dr Amit Vanka, and <sup>8</sup>Arwa Salman Jan

<sup>1</sup>Lecturer, Dentistry program, Department Preventive Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah

<sup>2</sup>Dental intern, Dentistry program, Ibn Sina National College for Medical Studies, Jeddah

<sup>3</sup>Dental intern, Dentistry program, Ibn Sina National College for Medical Studies, Jeddah

<sup>4</sup>Dentist, Ministry of Health, AlNoor specialist Hospital, Makkah

<sup>5</sup>Dental intern, Dentistry program, Ibn Sina National College for Medical Studies, Jeddah

<sup>6</sup>Vice Dean, Dentistry program, Department of Oral Basic and Clinical Sciences, Ibn Sina National College for Medical Studies, Jeddah

<sup>7</sup>Associate Professor, Dentistry program, Department Preventive Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah

<sup>8</sup>Dental intern, Dentistry program, Ibn Sina National College for Medical Studies,

**Abstract:** The potential given by technology and telecommunication is continually transforming dental care. Teledentistry has the potential to increase the quality of community health care. The purpose of this study is to evaluate the patient's teledentistry knowledge, attitude, and practices. This is a 15 days cross-sectional research with an analytical component. The information was gathered using a 13-item questionnaire. The survey asked about sociodemographics and the respondent's perspective on teledentistry. Google forms were used to collect the responses electronically. The patient's knowledge, attitude, and practice on teledentistry were measured as part of the outcome. Out of the socio demographic variables education, occupation, nationality, and family income, occupation was statistically significant. On the phone, 59.7% of the respondents said, they had received assistance from a dentist concerning their difficulties. On a virtual platform, 49.4 percent of respondents received advice from their dentist. According to the findings, participants believed that speaking with a dentist over the phone or via a virtual platform is equivalent to meeting with the dentist in person.

**Keywords:** Dental Patients, Teledentistry, Knowledge, Attitude and Practices, COVID 19, analytical study

### \*Corresponding Author

Dr Shanthi Vanka, Lecturer, Dentistry program, Department Preventive Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah



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## 1. INTRODUCTION

Tele health encompasses a wide range of technology and strategies for providing virtual medical health, and education services. Tele health is a collection of tools that can be used to improve the delivery of care and education. Many hospitals have been encouraged to play a crucial role in keeping communication with patients through telehealth. Tele dentistry like telemedicine is a relatively young branch of dentistry that employs information technology and modern communication networks to provide treatment across geographical boundaries.<sup>1</sup> Tele dentistry can be defined as the remote provision of dental care, advice or treatment through the medium of information technology, rather than direct personal contact with patients. Evaluation of patient experience of tele dentistry during the coronavirus pandemic and establishing the clinical effectiveness of Tele health in this context.<sup>2-5</sup> Tele dentistry utilizes telecommunications and dentistry involving virtual exchange of clinical information relevant imaging over distances for consultation and treatment planning.<sup>1</sup> The use of telephonic and video consultations help the dentist to continue communication with the patient without physical interaction reduces the fear of social interaction during this pandemic.<sup>6</sup> Tele dentistry has developed as a viable new tool for endodontics, orthodontics, oral surgery, and pediatric dentistry among other dental specialties.<sup>6,7</sup> Technology and telecommunications' potential is revolutionizing dental treatment on a regular basis.<sup>8</sup> The pandemic of COVID 19 due to novel pathogens is a global challenge to public health. Corona viruses are one class of pathogens that have been responsible for repeated disease outbreaks in the recent past.<sup>9</sup> The COVID-19 pandemic is a challenge for the healthcare systems across the globe.<sup>10</sup> It has created many challenges in ensuring health care access to the patients. The use of Tele dentistry can improve the quality of health care provision to the community.<sup>11</sup> Risk assessment, triage, and management via telephone or video links are promoted for resolving emergency concerns of patients without the patient having to travel long distances and come onsite for dental consultations. During this epidemic time, the dental staff has a great opportunity to aid the community by performing Tele dentistry.<sup>6</sup> There is a need to understand Teledentistry from the patient's point of view. Considering the importance of Tele dentistry, the authors have undertaken this study. The purpose of this research is to investigate the patient's perspective on using Tele dentistry instead of a face-to-face visit to the dentist for emergencies, follow-up, and preventive care instructions. The study is unique in such a way that it is the first to be undertaken on the community of patients who visit dental clinics in Jeddah. As there is little published evidence to support patient readiness for Tele dentistry, this

study will have an impact on how patients use Tele dentistry services now and in the future.<sup>12</sup> This research is needed to see if Tele dentistry can help with access to dental care difficulties in Dentistry. Dental patients are expected to seek oral care. They are the best people to express opinions about the use of Tele dentistry during the process of seeking oral care.<sup>13,14</sup> This study has been designed to collect information to assess the patient's knowledge, attitude and practices on Tele dentistry

## 2. MATERIAL AND METHODS

This is an analytical cross-sectional study that was conducted over a period of one month. The Institutional Research Review Board of Ibn Sina National College for Medical Studies has given approval to conduct this study. The IRRB approval number is H-22-19102020. The data was collected through a questionnaire. An extensive literature search was conducted using key words related to the patient's opinion on Tele dentistry, and with the results, a closed-ended multiple-choice questionnaire was created.<sup>15-17</sup> The questionnaire was prepared and translated to Arabic for patients' ease and understanding. The respondents had to give consent for the study before responding to the questions. The consent included the details of the survey, the length of time it would take to do the survey and the purpose of the study. The data gathered was kept confidential. The access to the data was only with the primary investigator of the study. The survey questionnaire consisted of 13 questions. The questionnaire included socio demographics and respondents' perspectives on teledentistry, such as whether they have received advice about problems from their dentist over the phone, received advice about problems on a virtual platform, their perceptions of whether consultation on the phone or virtual platform will save time, if they will be able to express themselves effectively on the phone or virtual platform, if telephonic consultation will be able to meet their needs, and if talking to a dentist over the phone will be able to meet their needs. The questions that measured knowledge is one, 10 questions measured the attitude and 2 questions measured the practices related to Tele dentistry.

### 2.1 Sample Size

The sampling was a convenience sample of patients from Ibn Sina Dental hospital clinics. Using the Raosoft online sample size calculator, the sample size was estimated to be 246. (Margin of error 5 percent, Confidence level as 95 percent, considers the population size as 1000000 and response distribution is 80 percent).<sup>18</sup> The selection criteria of the study is described below in a tabular format

Inclusion criteria	Exclusion criteria
Patients willing to participate in the study	Patients not willing to give consent to the study
Patient of both genders above 18 years of age	Patients below 18 years
Patient for any treatment to the dental clinics of Ibn Sina National College for Medical Studies	-

### 2.4 Distribution Of The Questionnaire

Google forms were used to collect the responses electronically. Whatsapp was used to make initial contact with interested participants. All of the students' patients were reached via Whatsapp messages. The information was gathered over a 15-day period. The questionnaire yielded

outcome measures of the patients' knowledge, attitude, and practice about Tele dentistry. Before fielding the questionnaire, the survey was prepared and the usability and technical functionality of the electronic questionnaire were assessed. The Cronbach's alpha, which was 80 percent, was used to determine the questionnaire's reliability.

### 3. STATISTICAL ANALYSIS

The statistical analysis was done using SPSS version 23. The responses were represented in descriptive statistics as numbers and percentages. Association between the categorical variables was obtained using the chi square test. A p value of <0.05 has been considered statistically significant.

### 4. RESULTS

There were 253 people that took part in the study, with an average age of  $37 \pm 12.85$ . Gender was used in every cross-tabulation analysis. 11.5 percent of participants had an elementary education, 18.6 percent had a secondary education, 15.4 percent had a higher education, only 1% had a diploma, 30 percent had graduated, and 13 percent were postgraduates. 58.5 percent of the participants were unemployed, 25.3 percent were employed, and 16.2 percent were students. Saudi Arabian ethnicity was represented by 69.6 percent of the participants. About 13.8 percent of families have an income of less than 3000 Saudi riyals, while 17.4 percent have an income of more than 10,000 Saudi riyals. The variable occupation was statistically significant among the socio demographic data of the participants, which included education, occupation, nationality, and family income. (Table 1) The opinions of the respondents on Tele dentistry were gathered and collected. (Table 2) On the phone, 59.7% of respondents said they had received advice from the dentist about their concerns, while 40.3 percent

said they had not received any. On a virtual platform, 49.4% of respondents received advice from their dentist, while 49.8% did not receive any guidance on a virtual platform. The percentage of participants who said that phone and virtual platform consultations would save time was 63.2 percent and 64.8 percent, respectively. In contrast to the 34.8 percent and 38.3 percent who said they would not be able to express themselves effectively when consulting via phone and virtual platform, 65.2 percent and 61.7 percent of participants said they would be able to express themselves effectively when consulting via phone and virtual platform. 63.2 percent and 65.2 percent of respondents believed that telephonic consultation and virtual platform will be able to meet their demands respectively, while 36.8% and 34.8 percent disagree. 54.9 percent of respondents believe that speaking with a dentist over the phone or through a virtual platform is the same as meeting with the dentist in person, while 45.1 percent disagree. Preventive care instructions and regular consultations are the types of treatments that respondents choose for Tele dentistry, with 32.8 percent preferring both, 26.5 percent preferring treatment planning, and 23.7 percent preferring emergency treatment. When it comes to emergency consultations, 49% of respondents choose phone consultations. However, 42.3 percent preferred face-to-face consultations for treatment follow-up. The majority of respondents (40.3 percent) preferred face-to-face counseling for preventative care guidelines.

**Table 1: Socio demographic details of the study participants**

Independent variables	Male n(%)	Female n(%)	Total n(%)	Chi square	p value
Education					
Primary	13(11.6)	16(11.3)	29(11.5)	3.261	.775
Secondary	30(22.3)	22(15.6)	47(18.6)		
Tertiary	16(14.3)	23(16.3)	39(15.4)		
Diploma	0	1(0.7)	1(0.4)		
Graduate	30(26.8)	46(32.6)	76(30.0)		
Postgraduate	15(13.4)	18(12.8)	33(13.0)		
Occupation*					
Employed	75(67.0)	73(51.8)	148(58.5)	10.933	.004
Unemployed	17(15.2)	47(33.3)	64(25.3)		
Student	20(17.9)	21(14.9)	41(16.2)		
Nationality					
Saudi	74(66.1)	102(72.3)	176(69.6)	1.159	.282
Non-Saudi	38(33.9)	39(27.7)	77(30.4)		
Family income					
(<3000)	13(11.6)	22(15.6)	35(13.8)	5.285	.259
(3000-5000)	30(26.8)	27(19.1)	57(22.5)		
(5000-7000)	38(33.9)	39(27.7)	77(30.4)		
(7000-10000)	16(14.3)	24(17.0)	40(15.8)		
(>10000)	15(13.4)	29(20.6)	44(17.4)		

\* p<0.05 (Statistically significant)

**Table 2: Study participants perspective on teledentistry**

Independent variables	Male N(%)	Female N(%)	Total N(%)	Chi square	p value
<b>I. Have you ever received any advice from your dentist about problems on the phone? (Practice based question)</b>					
Yes	70(62.5)	81(57.4)	151(59.7)	.662	.416
No	42(37.5)	60(42.6)	102(40.3)		

2. Have you ever received any advice from your dentist about problems on a virtual (audio visual) platform? (Practice based question)					
Yes	62(55.4)	63(44.7)	125(49.4)	2.945	.229
No	49(43.8)	77(54.6)	126(49.8)		
3. Do you feel that consultation on phone will save time? (Knowledge based question)					
Yes	70(62.5)	90(63.8)	160(63.2)	.047	.828
No	42(37.5)	51(36.2)	93(36.8)		
4. Do you feel that consultation on virtual platform will save time? (Attitude based question)					
Yes	74(66.1)	90(63.8)	164(64.8)	.138	.711
No	38(33.9)	51(36.2)	89(35.2)		
5. Do you feel that consultation on the phone you will be able to express effectively? (Attitude based question)					
Yes	77(68.8)	88(62.4)	165(65.2)	1.106	.293
No	35(31.3)	53(37.6)	88(34.8)		
6. Do you feel that consultation on virtual platform will be able to express effectively? * (Attitude based question)					
Yes	77(68.8)	79(56.0)	156(61.7)	4.273	.039
No	35(31.3)	62(44.0)	97(38.3)		
7. Do you think that using telephonic consultation you will be able to meet your need? (Attitude based question)					
Yes	66(58.9)	94(66.7)	160(63.2)	1.608	.205
No	46(41.1)	47(33.3)	93(36.8)		
8. Do you think that using virtual platform consultation you will be able to meet your need? (Attitude based question)					
Yes	72(64.3)	93(66.0)	165(65.2)	.077	.782
No	40(3.7)	48(34.0)	88(34.8)		
9. Do you think talking on a telephonic/ virtual platform to the dentist is the same as face to face meeting the dentist? * (Attitude based question)					
Yes	72(64.3)	67(47.5)	139(54.9)	7.089	.008
No	40(35.7)	74(52.5)	114(45.1)		
10. What type of treatment would you prefer to use in the Teledentistry platform? (Attitude based question)					
Emergency treatment	25(22.3)	35(24.8)	60(23.7)	3.864	.277
Preventive care instructions	31(27.7)	52(36.9)	83(32.8)		
Treatment planning	35(31.3)	32(22.7)	67(26.5)		
Regular consultation	21(18.8)	22(15.6)	43(32.8)		
11. What type of consultation would you prefer for an emergency? (Attitude based question)					
Face-to-face	37(33.0)	56(39.7)	93(36.8)	2.399	.301
Phone	61(54.5)	63(44.7)	124(49.0)		
Virtual	14(12.5)	22(15.6)	36(14.2)		
12. What type of consultation would you prefer for follow up of a treatment? (Attitude based question)					
Face-to-face	49(43.8)	58(41.1)	107(42.3)	2.732	.255
Phone	35(31.3)	35(24.8)	70(27.7)		
Virtual	28(25.0)	48(34.0)	76(30.0)		
13. What type of consultation would you prefer for preventive care instructions? (Attitude based question)					
Face-to-face	42(37.5)	60(42.6)	102(40.3)	.680	.712
Phone	39(34.8)	46(32.6)	85(33.6)		
Virtual	31(27.7)	35(24.8)	66(26.1)		

\* p&lt;0.05 (Statistically significant)

## 5. DISCUSSION

The current study is an analytical investigation on the knowledge, attitudes, and practices of patients attending a private dental facility in Jeddah that is affiliated with a dental school. The response rate in our study was 92 percent (a total of 275 patients were contacted, and 246 responded), which was higher than the male response rate of 38.6 percent and female response rate of 61.4 percent in Giudice et al 2020<sup>11</sup>, and the male response rate of 60 percent and female response rate of only 40 percent in Almazrooa et al 2021<sup>15</sup>. The mean age of the participants in Rahman et al 2020's<sup>16</sup> study was 36 years, which was almost identical to our study's 37±12.85. Because there are few published papers that systematically document the patients' perspective

on teledentistry, the article made comparisons based on the limited literature available.

The study by Pradhan et al, 2019<sup>17</sup> has concluded that there are 71.4% of the respondents who feel that consultation on the virtual platform will save time and 28.6% who feel it will not save time very similar to our study in which 63.2% and 64.8% respondents have responded that phone and virtual platform consultation will save time. The study participants of Pradhan et al, 2019<sup>17</sup> were dental students but our study targeted patients. We are discussing papers that include the perspectives of dental healthcare practitioners and dental students due to the scarcity of articles collecting data on patient perceptions of teledentistry. In our study, 65.2 percent and 61.7 percent of participants said they could effectively explain themselves over the phone and virtually,

respectively, and in a study by Rahman et al 2020<sup>16</sup>, 100 percent of telephonic and 97 percent virtual clinic patients said they could clearly express themselves. This backs up our findings, which show that using a telephonic/virtual platform is the same as meeting with a dentist (54.9 percent). As a result, we may conclude that telephonic and virtual service supply can be utilized efficiently. There are numerous obstacles involved with teledentistry, including patient apprehension that may or may not be addressed at all times, a communication gap that may emerge with the patient, and dental healthcare providers' worry of not being able to assist the patient with all of his needs.<sup>10</sup> Several problems have harmed the oral health care system during the epidemic. So, while teledentistry cannot completely replace patient care, it may certainly serve to enhance the current system of supporting patients in their hour of need. In the study by Rahman et al 2020,<sup>16</sup> 97% were willing to use virtual clinics for consultation and follow up but in our study it was only 27.7% willing to go for follow up on phone and 30% virtually. While a face-to-face consultation can add a personal touch to any interaction between a patient and a dentist, telephonic and virtual follow-ups become very effective ways of providing services to patients during times like pandemics and in some circumstances when patients cannot travel and consultations can be done online. In a study by Giudice et al 2020<sup>11</sup> they concluded that the awareness of the patient being monitored through his treatments using Tele dentistry helps in patient compliance and establishing a patient and dentist relationship. Although Tele dentistry is an innovative and effective option for face-to-face consultations, particularly during a pandemic, it has limits such as cost, security, and data security considerations. Due to internet security difficulties, care must be taken not to compromise the confidentiality of patient records or consultations. While the pandemic has historically created many difficulties Tele dentistry is a step in turning them into possibilities.<sup>19</sup> In the study by Dasseja et al <sup>20</sup> 70.7% of the respondents were unwilling to visit dental clinics during the pandemic and majority of the participants were in favour of using teledentistry. The combination of telemedicine and dental practice offers a wide range of benefits, including triaging patients based on the importance of dental care in such scenarios. The majority of the participants responded to the survey were in favor of teledental care. Dental practitioners should adapt to alternative techniques of tele dentistry as a means of consultation. The study by AlKhalifa<sup>21</sup> revealed that dental professionals are ready to participate in the teledentistry approach. To fully comprehend the readiness and challenges of teledentistry, more research on the business model is required. A targeted campaign to inform dentists and the general public about the technology and its possibilities is required.

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Teledentistry is a cutting-edge means of offering health care to the general public. The report also points out that teledentistry, which involves telephonic and virtual consultations, is a significant tool that dental clinics and hospitals can utilize to counsel patients about emergencies, follow-up care, and preventive care recommendations.

## 6. LIMITATION OF THE STUDY

The study's disadvantage is that it only collected information regarding the patients' perceptions. The responses were gathered through a google doc and whatsapp messaging rather than directly from the patients. Although virtual contacts have limits in terms of direct interactions with patients by dentists, where critical observation may be evaded, they do pave the way for true teledentistry practice, integrating telephonic and virtual exchanges, and then assessing their perceptions.

## 7. CONCLUSION

Oral health is a crucial aspect of overall health, and dentistry plays a significant role in our lives. Tele dentistry could be a solution to a number of current dental treatment issues, such as persons living in rural village areas and those who are unable to receive regular dental care, as well as ensuring the oral health of children in schools and child care. Teledentistry is a technique that can be used to replace face-to-face interactions with patients, with a few exceptions.

According to the study, speaking with a dentist via a telephonic/virtual platform is equivalent to visiting with the dentist face to face, particularly in terms of emergency, follow-up care, and preventive care advice. This study could serve as a starting point for future research in this area, in which we actually practice Tele dentistry and solicit patient feedback.

## 8. AUTHOR CONTRIBUTION STATEMENT

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## 9. CONFLICT OF INTEREST

Conflict of interest declared none

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