

Measuring Dental Student's Awareness and Knowledge about Teledentistry in Saudi Arabia

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ABSTRACT

Aim: The present cross-sectional study was conducted among dental students to assess the awareness and knowledge about Teledentistry in Saudi Arabia.. **Materials and Methods:** A cross-sectional study was carried out on the sample size of 300 dental professionals (Males 150 & Females 150) in College of Dentistry, King Khalid University, and Abha, Saudi Arabia, to know the awareness of teledentistry among dental students. The questionnaire consists of two main parts: Part 1 includes sociodemographic information of the participants (age and gender), part 2 is related to the dental professionals' knowledge of telemedicine (ten items). The survey data was collected and organized into Microsoft Excel spreadsheets (Microsoft Inc., USA), and was statistically analyzed utilizing the Statistical Package for the Social Sciences version 20.0 software (IBM Inc., USA). The statistical test used here was the chi-square test and P values less than 0.05 were considered to be statistically significant ($P < 0.05$). **Results:** When dental students were asked about whether they heard about teledentistry, their 33% were said yes and majority said no, a comparative between male and female regarding question were statistically significant. When they asked about the meaning of teledentistry: 29% said through telephone and 71% said through media. 54% of the study participant said they are willing to practice teledentistry in future. 48% of participants agreed that teledentistry can really help in health education of masses; only 29% were not agreed with it. **Conclusions:** Finding revealed that the majority of dental professional's knowledge was low, and their attitude toward teledentistry was found to be good. Awareness must be spread among the dental students regarding the proper use of teledentistry in future dentistry.

Key words: Teledentistry, Knowledge, Dentists, Saudi Arabia, Cross-sectional study

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INTRODUCTION

Health care has encountered a theatrical change with the epoch of telecommunications

and computers. Dental care is likewise being transformed gradually due to the opportunities provided by the technology. Teledentistry is a rapidly growing branch with a combination of dentistry combined with telecommunication [1]. Teledentistry has become a part of telemedicine. It is derived from the Greek word "Tele" meaning distance and Latin word "Mederi" meaning to heal [2]. In 1997, Cook defined Teledentistry as, "The practice of using video-conferencing

technologies to diagnose and provide advice about treatment over a distance [3, 4]. Oral health is an integral part of general health. Teledentistry is a fast advancing branch which is an effective combination of technology with dentistry. It involves fast and effective transfer of information pertaining to patients through electronic gadgets over remote distances. This enables an effective exchange of information and knowledge between patient and doctor and among various specialists for better treatment planning and outcome [5].

Teledentistry indeed plays a significant role in various fields of dentistry, as you've highlighted. Teledentistry enables easy access to specialists for diagnosing and treatment planning of complex cases by sharing radiologic images of lesions. This can expedite the consultation process and enhance the accuracy of diagnoses. Teledentistry can be instrumental in the appropriate treatment of complicated cases by allowing experts to analyze advanced dental imaging techniques, such as Cone Beam Computed Tomography (CBCT). This is especially valuable when such imaging resources are not available at a single center [6]. Teledentistry facilitates collaboration among orthodontists and allows for multiple opinions on routine cephalometric analysis. This collaborative approach can lead to improved treatment outcomes. Teledentistry can enhance patient engagement and satisfaction by allowing for the sharing of pre and post-treatment images. This helps patients visualize their progress and better understand their treatment plans. In addition to these specific fields, teledentistry can also contribute to overall dental care by improving accessibility to dental services, especially in underserved or remote areas. Patients can receive consultations, guidance, and even preventive education through teledentistry, expanding the reach of dental healthcare [7, 8]. However, it's essential to ensure that teledentistry complies with legal and ethical standards, including patient privacy and data security, to deliver safe and effective care. Hence, the aim of this study is to assess the dental student's awareness and knowledge about Teledentistry in Saudi Arabia.

MATERIALS AND METHODS

A cross-sectional study was carried out on the sample size of 300 dental students (Males 150

& Females 150) in College of Dentistry, King Khalid University, and Abha, Saudi Arabia, to know the awareness of teledentistry among dental students. Written consent was taken from the respondents, and ethical approval for performing the survey was obtained from the Scientific Research Committee of King Khalid University, College of Dentistry.

The questions were designed such that they assess the knowledge of teledentistry among dental students and were circulated among dental students in the dental college. Questionnaires were translated into local language (Arabic) and then back to English in order to ensure that the translated version gives the proper meaning. The questionnaire consists of two main parts: Part 1 includes sociodemographic information of the participants (age and gender); part 2 is related to the dental students' knowledge of teledentistry (ten items). The questionnaire consisted of 10 close-ended, validated, structured, self-administered questions on awareness regarding teledentistry and was prepared based on other studies [9, 10]. Using the convenience sampling, the questionnaires were distributed to all the 300 dental students from the College of Dentistry.

A self-administered structured questionnaire was developed and tested among a convenience sample of 20 dental students, who were interviewed to gain feedback on the overall acceptability of the questionnaire in terms of length and language clarity, according to their feedback the questions were corrected. Face validity was also assessed before the start of the study. Both descriptive and analytical statistical measurements were used to describe the main variables by SPSS 18 (IBM Corporation, Armonk, New York, USA) software. Chi-square, ANOVA was used to compare the qualitative and quantitative variables. The statistical significance of the coefficients in the statistical analyses will be tested at 0.05 (≤ 0.05) level.

RESULTS

A total of 300 persons responded to the questionnaire. 150 (50%) were females and 150(50%) were males. 89% of study subjects were of 20-30 years, 8% were of 31-40 years, 3% were of 41-50 years [Table 1]. Knowledge and awareness among dental students regarding teledentistry [Table 2 and Figure 1].

Table 1: Distribution of study sample according to Age.

Age	n	%	P-Value
20-25 years	202	67%	0.984
25-30 years	58	19%	
>30 years	40	14%	

*P<0.05; n = Number; % = Percentage

Table 2: Comparison of males and female dental students in terms of knowledge and attitude towards Teledentistry.

QUESTIONS	Total	%
	300	
Q1. Have you heard about teledentistry?		
Yes	99	33%
No	201	67%
Q2. What do you mean by teledentistry?		
Through telephone	87	29%
Media	213	71%
Q3. In future do you practice teledentistry?		
Yes	162	54%
No	138	46%
Q4. What is your opinion about teledentistry?		
Very useful	105	35%
Limited in general dentistry	72	24%
Limited in dentistry	87	29%
Too many legal issue	36	12%
Q5. Do you agree that teledentistry can really in health education of masses?		
Yes	144	48%
No	72	24%
Don't know	84	28%
Q6. Do you agree that teledentistry can be a good tool for oral hygiene training?		
Yes	162	54%
No	87	29%
Don't know	51	17%
Q7. Do you agree that teledentistry is not financially feasible?		
Yes	90	30%
No	105	35%
Don't know	105	35%
Q8. Do you think teledentistry is time saving?		
Yes	171	57%
No	69	23%
Don't know	60	20%
Q9. Do you feel that teledentistry can help in dental tourism?		
Yes	123	41%
No	84	28%
Don't know	93	31%
Q10. Do you agree that teledentistry is going to be a preamble to the robotic dentistry?		
Yes	123	41%
No	72	24%
Don't know	105	35%

n = Number; % = Percentage.

When dental students were asked about whether they heard about teledentistry, their 33% were said yes and majority said no, a comparative between male and female regarding question were statistically significant. When they asked about the meaning of teledentistry: 29% said through telephone and 71% said through media. 54% of the study participant said they

are willing to practice teledentistry in future. 48% of participants agreed that teledentistry can really help in health education of masses; only 29% were not agreed with it. Majority of students were agreed that teledentistry is time-saving (57%) and only a few 23% were said it's not time-saving. When the dental students were asked about the teledentistry can help in dental

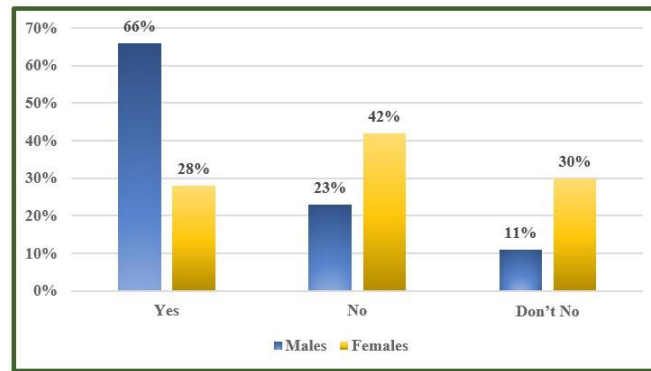


Figure 1: Do you agree that teledentistry can be a good tool for oral hygiene training?

tourism: 41 % of participants said yes and 28% did not agree with it. Teledentistry is going to be a preamble to the robotic dentistry regarding this: 41% of participants agreed.

DISCUSSION

An innovation has been made in the health field to save lives in the remote regions of any country. This innovation is the e-health. E-Health is using Information and Communication Technologies (ICT) for health care. Teledentistry is the utilization of telecommunications to achieve dental hygiene, appointments, education and open public education, very much the same seeing as telehealth and telemedicine [11]. Teledentistry may also be used to aid general dentists with specialty functions and improve providers to underserved populations without or with limited usage of maintenance [12]. Today's research illustrates the consciousness among oral students relating to a fresh and interesting issue i.e. Teledentistry. It offers a limitless potential to the dental care college students utilizing the net in dentistry. The effects recommend that the majority of the respondents experienced poor knowledge of various areas of teledentistry, and also fewer had ever heard of teledentistry (33%), which can be by much less than the amount of health college students from various other studies, which can be 96.5% [9, 13].

Teledentistry is undoubtedly a recently available pregnancy and requires devices such as smartphones on the market and mass media, which is obviously used even more by the youthful era in comparison with the elderly. Most students (54 %) had been alert to the actual fact that teledentistry is a great device for dental hygiene teaching, which is smaller in

comparison to various other research executed by Pradhan (2019), 77.9%. Furthermore, 35% of respondents assumed that teledentistry is on a financial basis feasible. Very similar outcomes have been seen in a report executed simply by Nagarajappa Ur et al., (2013) [5]. Teledentistry is without question a good program for both the patient plus the dental professional and will be applied in a variety of sub-specialities of dentistry. That decreases the time needed for multiple views by several professionals, and it is also less expensive for the individual and the physician. Prevention and early recognition of any kind of carious laceration or a soft tissue lesion can be likely through teledentistry [14]. These plan to cause effectiveness, provide you with usage of the underserved inhabitants, improve the top quality of caution, and decrease oral disease burden. Consequently, it is vital to acquire knowledge and awareness about the use of the web and PCs in oral school. Besides, studies proved that oral learners believe the utilization of the web and computers can help them in teledentistry later on [15]. Amongst the growing technologies in neuro-scientific teledentistry, dental practitioners may gradually web page links about virtual oral health setups and a completely novel period of dentistry will be made. Around 41% dentists arranged with the declaration that teledentistry might help in dental vacation. That is relative to the analysis completed by Boringi M et al., where almost 45.3% decided. Since the demand intended for teeth tourist has climbed considerably, appropriate measures to attain dentistry in widespread city towns have grown to be necessary. Around 54% of dental offices demonstrated confident attitudes toward teledentistry to apply in future, and 35% explained it is rather within scientific practice. Teledentistry, a comparatively new discipline,

can transform the dynamics of the dental hygiene delivery system. It'll bridge the gaps among general dental practices and authorities utilize recently isolated strength, and, most of all, it'll present patients with inexpensive, available, quality dental hygiene. This is specifically encouraging in support of isolated multitude and also requires problems accessing the teeth's health caution system because of distance, capability to travel, or perhaps insufficient teeth's health care services within their place. The majority of the common learners wish to include teledentistry used but do not find out about just how of addition; therefore, teaching must be directed at them. Different CDE tasks and courses should be comprised of oral experts upon new developments in uniqueness. Teledentistry could be a valuable device for long-range continuous dental education applications love webinars. With the utilization of teleconferencing tools, educational lectures could be broadcasted into a remote control web page. Regardless of the large number of procedures that may reap the benefits of teledentistry as well as the wide variety of applications, constraints to the utilization of information conversation and technology remain. The usage of digital pictures found in diagnosis could be a helpful device to identify noticeable lesions, but the pictures have their personal shortcomings. The pictures account for a two-dimensional watch of three- dimensional objects, which make a difference in the accuracy of medical diagnosis. An additional limitation of pictures may be the quality of captured pictures, as teledentistry requires pictures of top quality that could not end up being manufactured in every center / clinic found in rural areas. That gives another problem: that's the price of teledentistry helping technology that may represent an encumbrance on the two governments and people [16]. The limitation of the analysis was administered above academic university and dentist medical center; consequently, the outcomes of the analysis cannot be related to the complete dental care population. Finally, this acquisition revealed that most dental professionals' knowledge was low, and the attitude toward teledentistry was found to be very good, which can be good prior outcomes of similar research. Despite an optimistic knowledge, the attitudes of dentists concerning teledentistry recommended

insufficient schooling programmers and in addition, many made an appearance unwilling to look at brand-new tactics and choose to keep with basic teeth's health services. Therefore, organized education programs and classes to boost the knowledge and attitude of dentists, specifically people who have significantly less qualification and function experience, is the want of the hour. This can be achieved by increasing the scope of education regarding teledentistry at central government level through preparing legislation.

Conflict Of Interest

No funds were provided by any outside agency for this study, and neither author has any conflict of interest.

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