



INTERVENTIONAL EDUCATION METHOD FOR INCREASING KNOWLEDGE OF TELEDENTISTRY

Dental Science

Dr. Pawan Krishna Murti* Department of Public Health Dentistry, SDM College of Dental science and hospital, Dharwad. *Corresponding Author

Dr. K. V. V Prasad Department of Public Health Dentistry, SDM College of Dental science and hospital, Dharwad.

Dr. Harish. K Department of Public Health Dentistry, SDM College of Dental science and hospital, Dharwad.

ABSTRACT

Objective: This study aimed to examine the effectiveness of educational method on the improvement in knowledge about teledentistry among BDS students.

Methodology: A total of 75 subjects from 3rd and 4th year BDS aged between 19 to 23 years were included. Subject's baseline knowledge on teledentistry was assessed by a pre tested, self-administered questionnaire. After this, an educational program on teledentistry using audio-visual aid was provided and the subjects were re-evaluated by the same questionnaire to measure the level of improvement of knowledge on teledentistry. The collected data was statistically analyzed by descriptive statistics and Pearson's correlation test using SPSS 21.0 version.

Results: Knowledge scores before giving educational program was found to be 16.7% in 4th year 15.5% in 3rd year and only 5.3% people wanted to practice teledentistry in future. After giving educational program the knowledge was increased to 72% among 4th year and 65.3% among 3rd year subjects. People who want to practice teledentistry in future also increased to 64%. There was positive correlation between educational program and improvement in knowledge as estimated by Pearson value of 0.441.

Conclusion: There was a significant improvement in knowledge about teledentistry after giving educational program and also significant increase in percentage of people who want to practice teledentistry in future. Educating students about teledentistry improves their knowledge and awareness. Thus, it should be integrated into the dental curriculum which can create a newer insight in dental practice.

KEYWORDS

Interventional, knowledge, teledentistry

INTRODUCTION

Dental consideration is in effect continually changed by the chances which are given by innovation and media transmission. The term telewellbeing used to portray medical care administration over a distance. Developing nations have opened up to utilization of innovation like telemedicine to address different challenges faced by health care delivery system like inaccessibility of health care service, and insufficiency of specialist.

Oral health is an integral part of general health. Nowadays dental care is being constantly transformed by opportunities provided by technology and telecommunication. Teledentistry is a combination of telecommunication and dentistry which involves the exchange of clinical information and images over remote distances [1]. Dental professionals have used technology such as intraoral camera, in private practice for patient education and case acceptance, however, teledentistry has been underused as a means of diagnosis and referral in dentistry.

Cook in 1997 defined "Teledentistry" as the practice of using video-conferencing technologies to diagnose and provide advice about or those of underserved populations where money is a great concern to people residing in remote areas as treatment over a distance [2]. Teledentistry can be greatly utilized with rural communities well as the distance poses a big hurdle to seek dental treatment [3]. Furthermore, the people in a rural setting have a plight of minimum or almost no treatment facilities setting up an ideal example of "inverse care law". Millions of children and adults lack regular access to routine dental care, and many of them suffer needlessly with disease that inevitably results in significant decrements in their quality of life. [4-6] Teledentistry will increase the access and beside cost efficient, it will be able to meet patient demand from remote areas. An Australian study reported potential savings up to 40 million dollars per year if teledentistry was implemented for screening of low caries risk children. [7]

Teledentistry can be used in every branch of dentistry. Orthodontics is able to successfully help in the management of children with special needs [8]. According to Berndt et al. orthodontic treatment monitored from a distance via teledentistry systems has still been very promising in the management of occlusions in these children [9]. Aziz and Ziccardi stated that the advances and availability of smart phone technology have contributed to the feasibility and availability of

telemedicine in oral and maxillofacial surgery [10]. Zivkovic et al. have demonstrated that there is no statistically significant difference in the interpretation of periapical lesions between the images viewed locally (using a view box) and images transmitted via a video-conferencing system and viewed on monitor screen [11]. A national survey study done in Saudi Arabia investigate the applicability and reliability of teledentistry in the field of diagnostic dentistry and explore the perception of Saudi dentists of its benefits and concerns. 83% were confident that teledentistry can improve daily dental practice, specifically in the fields of oral radiology followed by endodontic and oral medicine [12].

Teledentistry and information system has a potential to meet these needs by just logging into the system and getting treatment advice or the treatment itself immediately. Oral health services in rural areas require health professional consult expertise. After graduation our professional may go and start providing oral health services at various areas. In our dental curriculum there is no topic or subject related to teledentistry. Thereby, we need to know that whether graduating dentist are aware about teledentistry. Thereby, study is attempted. The aim of the study to find out the effect of interventional education method in improving the knowledge of teledentistry among 3rd and 4th year BDS students.

OBJECTIVES:

1. To collect data regarding teledentistry among BDS students before the educational program by questionnaire.
2. To collect the data on teledentistry after the educational intervention by questionnaire among BDS students.
3. To compare before and after influence of educational intervention related to teledentistry among BDS students.

MATERIALS AND METHODS

Study Design And Population

This was a cross sectional study conducted among 3rd and 4th year BDS students aged between 19 to 23 years in private dental collage of north Karnataka. It was conducted for the period of June 2020 to November 2020

Inclusion And Exclusion Criteria

All the students willing to participate in the study who were in 3rd and 4th year were considered in the inclusion criteria. While the exclusion criterion included students absent on the predecided days of the study

and students who did not give consent for participate in the study.

Ethical Approval And Informed Consent

The study protocol was approved by the Institutional Review Board and ethical approval was obtained (IRB.No.2020/P/COMM/60) .A written informed consent form was also obtained from all the participants

Sample size is estimated using the formula:

$$n = \frac{P(1-P)}{A^2} \times \frac{Z^2}{R} \times \frac{N}{N-1}$$

n = Sample size required; N = Number of people in the population
 P = Estimated variance in population, as a decimal;
 A = Precision desired, expressed as a decimal
 Z = Based on confidence level: R = Estimated Response rate, as a decimal.

Applying the above formula to the study

$$\text{Sample size (n)} = \frac{0.5(1-0.5)}{0.06^2} \times \frac{1.96^2}{0.9} \times \frac{90}{90-1}$$

$$n = 75$$

A total of 75 subjects from 3rd and 4th year BDS aged between 19 to 23 years were included. Subject's baseline knowledge on teledentistry was assessed by a pre tested, self-administered questionnaire.

Data Collection And Analysis

The questionnaire was distributed by a single investigator. The students were told to approach the investigator immediately in case of any doubts regarding any of the questions in the questionnaire. The correct response for each question was validated and reviewed from different source of information. The questionnaire comprised of two parts which included as follows:

- Part 1: Sociodemographic details
- Part 2: Questions relating to knowledge and awareness regarding teledentistry

The questionnaires were distributed before giving educational program and base line knowledge was recorded. Teledentistry educational program using audio-visual aid was implemented and after some months questionnaire were distributed again to measure the change of knowledge on teledentistry.

Statistical analysis: The collected data was entered into SPSS 21.0 version and then subjected to statically analysis using descriptive static.

RESULT

The study population consist of 75 subjects .Majority of them were female(80%) while 20 % were male.62.60% were from 4th year while 37.30% were from 3rd year The age distribution of subject were from 19-23 years. Majority of them were from 21 years. (Table 1)

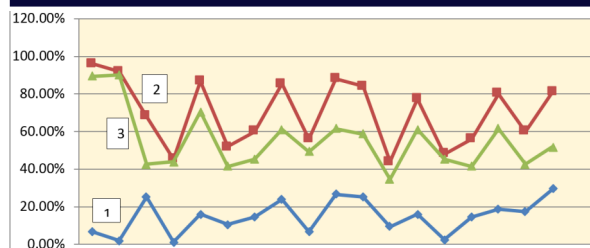
Table -1 Description of demographic characteristics of participants.

Characteristics	Frequency	(%)
Gender		
Male	15	20
Female	60	80
Academic year		
3 rd year	28	37.30%
4 th year	47	62.60%
Age		
19years	4	5.3
20years	20	26.6
21 years	30	40
22 years	18	24
23 years	3	4

We had noticed that before educational program only 6.67% of subject had heard about teledentistry but after educational program percentage increased to 96%.Table 2 had depicted percentage of subject given correct response for each question before and after educational program .It was noticed that for each question percentage had increased after educational program. Line graph (Graph-1) represent knowledge at baseline level, after educational program and improvement noticed after educational program. We had seen high percentage of improvement among study subject. Graph-2 demonstrate response for” how they like will to share in future about their experience of knowing, where to find information and how to resolve it”. At baseline level percentage of student opting teledentistry was less but percentage had increased after educational program. When asked about will they support a government initiative, whereby patient can obtain advice on treatment need from a central faculty such as PHC connected by teledentistry ,81.30% of subject had supported this after educational program .Table -3 demonstrate paired sample test ,Mean was 41.500 while standard deviation was 11.693. It is significant with correlation of .441 and it shows educational program was effective in increasing knowledge

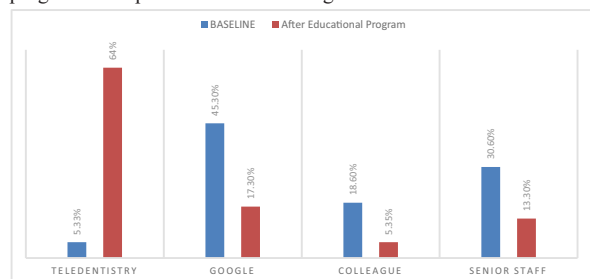
Table 2 Demonstration Of Knowledge For Correct Response At Baseline Level And After Educational Program

Questions	% subject given correct response at Baseline level	% subject given correct response after educational program
1) Do you know what teledentistry is?	2	92
2) Is Teldentistry a direct face to face interview?	25.30	68
3) Can teledentistry be applied within the same institutional level for sharing information from one department to other?	1.33	45.30
4)Does teledentistry help to monitor the patient's oral health?	16	86.60
5) Teledentistry is not a useful tool for early and easy consultation of orofacial disorder	10.60	52
6) Is it useful for late and advanced disorders?	14.60	60
7) Can it be used as a tool for educating UG students, PG students and for updating for dental practioners?	24	85.30
8) Is teledentistry expensive and does not save the time for dentist? It is not cost effective.	6.67	56
9) Can teledentistry be useful for education, and training of primary health care dentist?	26.60	88
10) Can teledentistry be a tool for public awareness programme?	25.30	84
11) Does teledentistry decrease the accessibility of the specialty to rural and undeserved community for their dental need?	9.30	44
12) Is teledentistry a convenient form of oral health care delivery that makes dental examination easier?	16	77.30
13) Teledentistry can never make sound decision regarding management of oral disease. It just gives little idea about the disease	2.66	48
14) Teledentistry violate the patient's privacy. So it is major challenge in our area?	14.60	56
15) Can teledentistry be helpful in dental tourism?	18.60	80
16) Can teledentistry be preamble to the robotic dentistry?	17.30	60



Graph-1 Knowledge At Different Stage

1. Baseline knowledge 2. Assessment of knowledge after educational program 3. Improvement in knowledge



Graph-2 Student's Opinion About How To Find Information In Future

Table-3 Paired Samples Test

Paired Differences					t	Sig. (2-tailed)	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
After - Before	-41.500	11.693	2.756	35.685	47.315	15.057	17	.000

DISCUSSION

Owing to advancing technology, there has been a radical change in conveying oral health care to the patients. One such change is because of the budding field of teledentistry. It can be of different types such as: patient–dentist, dentist–specialist, dentist–data storage bank, students–dental education and dentist research centre.

The present cross-sectional questionnaire study has uncovered an interesting but new topic in relation to dynamic technology in dentistry (teledentistry) among students of Dharwad. Dentistry, in a synergistic mix with media communications innovation and the web, has yielded a moderately new and energizing field that has interminable potential. Teledentistry has been developing since 1994 as a means to allow dental professionals to communicate with one another over long distances. It allows collaboration by multiple practitioners. It permits joint effort by different specialists. It includes the trading of clinical data and pictures over far off distances for dental consultation and treatment planning.

In the present study, the knowledge regarding teledentistry was assessed among the 3rd year and 4th year B.D.S. students before and after the educational intervention. Knowledge scores before giving educational program was found to be 16.7% in 4th year 15.5% in 3rd year and only 5.3% people wanted to practice teledentistry in future for finding information in future. After giving educational program the knowledge was increased to 72% among 4th year and 65.3% among 3rd year subjects. People who want to practice teledentistry in future also increased to 64%. It might be because after educational program, subject got the knowledge about importance and use of teledentistry so their interest toward it got increased. With regard to support government initiative, to connect PHC by teledentistry majority of the subject supported after educational program. It might be because before educational program they were having very little or vague knowledge about teledentistry but after educational program they understood that it can be good initiative to fill the gap of disparity among underserved population by connecting teledentistry to PHC. The present study shows that there was positive correlation between educational program and improvement in knowledge as estimated by Pearson value of 0.441. All these intend to bring about efficiency,

provide access to underserved population, improve quality of care, and reduce oral disease burden. Therefore, it is essential to improve knowledge and awareness regarding the use of the teledentistry in dental school. The strength of this study is that it is unique and novel because it is to our knowledge no such study is being conducted yet where educational program had implemented for improving knowledge of teledentistry. There are several limitations to study as Time period between before and after educational program was small, Study conducted only in one educational system which may not generalized the conclusion of study.

The future of teledentistry is exciting. Any physician or dentist who has a modern desktop computer, one of several software programs to facilitate teleconsulting, a modern connection to the internet, a digital camera, a radiograph/text scanner, and a minimum amount of training will be able to access a teleconsultant. This individual can send appropriate patient history and examination findings and high-quality images to the expert teleconsultant. It is anticipated that complete patient records can be transmitted in just minutes. The addition of high-resolution digital photos; audio and video clips; and magnetic resonance imaging, computed tomography or standard radiographs that have been digitized will require some additional transmission time, depending on the size and number of images to be sent (however, the transmission time is not always critical since most teleconsults are not real-time events). For the largest imaging files (e.g., magnetic resonance imaging), regular telephone service will not be adequate because transmission time is far too long. In these instances, cable and satellite transmission methodologies have to be used. [13-14]

CONCLUSION

The study concludes that there was significant improvement after giving educational program, regarding teledentistry. There was significant increase in percentage of study subject who want to practice teledentistry. Educating students about teledentistry improves their knowledge and awareness. By incorporating topic of teledentistry into the dental curriculum which can create knowledge regarding teledentistry. Awareness about teledentistry among student encourage them to practise teledentistry. It can be a tool for better access to health care, education and treatment.

REFERENCES

- (2006) Teledentistry as a method to improve oral health access in Florida. SOHIP teledentistry workgroup.
- Cooper BR, Engeswick LR (2007) Knowledge, attitude and confidence level of dental hygienists students regarding teledentistry. A pilot study. JIAHSP(2007) 5: 1-4.
- Sanchez Dils E, Lefebvre C, Abeyta K (2004) Teledentistry in the United States: a new horizon of dental care. Int J Dent Hyg: 161-164
- Sanjeev M, Shushant GK (2011). Teledentistry a new trend in oral health. International journal of clinical cases and investigations. 2(6):49-53.]
- Reddy KV (2011). Using teledentistry for providing the specialist access to rural Indians. Indian J Dent Res. ;22:189.
- Brullmann D, Schmidtmann I, Warzecha K, Dhoet BJ. Telemed(2011): Recognition of root canal orifices at a distance - a preliminary study of teledentistry. Telecare.;17(3): 154-57.
- Mohamed Estai, Stuart Bunt, Yogesan Kanagasigam, Marc Tennant (2017): Cost savings from a teledentistry model for school dental screening: an Australian health system perspective- 42(5)
- Mihailovic B, Miladinovic M, Vujicic B. Telemedicine in dentistry (teledentistry) (2011) In Grashew G and Roelots TA (editors). Advances in telemedicine: applications in various medical disciplines and geographical area.
- Berndt J, Leone P, King G (2008) Using teledentistry to provide interceptive orthodontic services to disadvantaged children. Am J Orthod Dentofacial Orthop 134: 700-706.
- Aziz SR, Ziccardi VB (2009) Telemedicine using smartphones for oral and maxillofacial surgery consultation, communication, and treatment planning. J Oral Maxillofac Surg 67: 2505-2509.
- Zivkovic D, Tosic G, Mihailovic B, Miladinovic M, Vujicic B (2010) Diagnosis of periapical lesions of the front teeth using the Internet. PONS Med J 7: 138-143
- Soulafa A. Almazrooa, Ghada A. Mansour, Sana A. Alhamed, Sarah A. Ali, Sara K. Akeel, Nada A. Alhindi, Osama M. Felemban, Hani H. Mawardi, and Nada O. Binmadi The application of teledentistry for Saudi patients' care: A national survey study 2021 Jan; 16(1): 280-286
- Clark GT. Teledentistry: what is it now, and what will it be tomorrow? J Calif Dent Assoc 2000;28:121-7.
- Eraso FE, Scarfe WC, Hayakawa Y, Goldsmith J, Farman AG. Teledentistry: protocols for the transmission of digitized radiographs of the temporomandibular joint. J Telemed Telecare 1996;2:217-23.