

Attitude and Interest of Dentists and Dental Patients Towards Teledentistry Services for Oral Healthcare Management Bangladesh

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Abstract

Background: Oral health is an integral part of our overall health and well-being but it is regularly ignored in the healthcare delivery system in Bangladesh. A few significant factors are the general public's lack of awareness and the shortage of infrastructure and resources like dentists and specialists. Due to the COVID-19 pandemic, the condition is more critical. Many countries are practicing Teledentistry (Smart-phone-based digital platform) services which could be an alternative for Oral Health Care Management in Bangladesh both for the urban and rural people. So, the aim of this study was to assess the attitude and interest of dentists and dental patients in Bangladesh towards Teledentistry which is a technology-based digital platform for oral health care management.

Materials and methods: This cross-sectional study was conducted during the period from July - December 2021 using a pretested semi-structured questionnaire for dental patients. An online questionnaire was sent to 300 participants of both rural and urban people of Bangladesh and 206 responded. The response rate was 68%. For dentists we used a qualitative approach, we conducted a focus group discussion at Dhaka Dental College Hospital among a group of dentists.

Results: The findings of this study showed that 82.7% of dental patients were highly interested in teledentistry for use in the future if available in our country and 74.3% of them were not satisfied with present oral and dental service-taking procedures. At the same time, the majority of the dentists showed a positive attitude and interest towards Teledentistry service in Bangladesh and they expressed that it will be an amazing initiative for our country which is the need of time now.

Conclusion: So, the findings of this study assessed the attitudes and interests of dentists and dental patients which will help in the future development of smartphone phone-based teledentistry platform in Bangladesh.

Key words: Attitude and interest; Dentist; Dental patient; Oral healthcare management; Smart tools; Teledentistry.

INTRODUCTION

Oral health problem is considered the most widely recognized public health concern with significant socio-economic influences globally, which is always ignored in public health care policy. In comparison with other non-communicable diseases' complications of different types of dental problems are increasing tremendously. Oral cancer exists as a major cancer in this subcontinent which is considered the eighth most common cancer globally. Approximately 90% people of in the world at any time of their life course suffer from some form of oral disease.¹

In the year 2016, there were nearly 45,000 newly identified oral and pharyngeal cancer cases diagnosed in the United States of America and more than 10,000 deaths

occurred.² Evidence shows that people having multiple oral health problems are at a higher risk of mortality.³ Patients suffering from severe chronic periodontitis are at risk of developing different types of cardiovascular disease including MI (Myocardial Infarction) atherosclerosis and stroke.⁴ Associations between periodontal disease and diabetes have also been established internationally.⁵ The outcomes of general oral health problems seriously impair food intake and mastication, conversation, social communication and quality of lifestyle.

Bangladesh faces many challenges during providing oral health care services. There is a huge gap in knowledge and behavior among the general population regarding oral health.⁶ In Bangladesh, more than 80 percent of people have at least one or more oral and dental problems.⁷ So, the situation of dentistry in Bangladesh is really challenging.

A large number of Bangladeshi populations reside in rural areas. They cannot afford dental healthcare facilities due to a lack of service providers, financial crisis, inaccessibility and many other constraints. In Bangladesh, the facilities for dental health care are limited and the population to dentist ratio is 100,000: 2.⁸ A study showed that 90.65% of respondents have visited on an emergency basis while only 9.35% visited for a regular dental checkup. About 27.53% of the respondents never visited a dental health care specialist. It indicates that a notable portion (27.53%) is not aware of dental health care.⁷ In the STEP SURVEY (2018) of Bangladesh, only 1% of dental patients visited oral healthcare facilities for preventive purposes and the rest of the patients visited for treatment purposes.⁹

Negligence is a common cause in Bangladesh for not visiting dental care. Lack of awareness about oral health, people didn't feel the need to seek dental treatment. Unaffordability, fear and inaccessibility are other reasons for not seeking dental treatment.¹⁰ There are no or very few dental clinics in the villages, dental patients come to seek treatment at the upazilla health centers for their immediate medical attention, but most of the upazilla health centers have no arrangements for providing dental care. In reality, maximum rural people go to quack for dental treatment and become victims of malpractice which brings a very hazardous outcome on their oral health.

Lack of health literacy is another factor for poor oral health and a study showed that the health literacy level of general people of our country was 51%. Maximum people do not know the proper brushing technique.¹¹ A study in a rural area of Bangladesh showed that the oral hygiene practice and oral health awareness of school-going children were very poor. Maximum patients came to dental surgeons when their condition worsened and most of them didn't visit dentists at the initial stage.¹² Recently, due to the COVID-19 pandemic, the situation has become more critical for both patients and dentists. Many dental practitioners stopped providing dental treatment in the early stage of the pandemic because of the high transmissibility of COVID-19.

At present, oral health care has been enriched by the advancements provided by technology and telecommunication. Teledentistry has been established as an effective medium to bridge the gap between urban and rural populations' oral health conditions and also to provide proper oral and dental health care and has to be applied in Bangladesh to minimize oral health service-related problems.

The usage of Teledentistry has already been recognized within different fields of dentistry such as oral medicine, oral surgery, detection of dental caries, periodontal conditions, and most significantly dissemination of preventive guidelines to the mass people. In modern days, oral and dental health care services such as Teleconsultation, Tele diagnosis, electronic patient referrals and patient electronic records keeping are the key modes used frequently.¹³ Teledentistry is being practiced widely in developed countries-notably in Australia, North America, Scandinavian countries and South Africa.^{14,15} Due to our country's scarcity and unequal distribution of specialist dentists, Teledentistry will be a strong and useful medium to tackle this issue. The popularity of Teledentistry is due to its cost-effectiveness and increased accessibility to oral and dental health care.

The transmission route of coronavirus is closely related to dental practice. Most dental procedures are closely related to producing droplets containing microorganisms which facilitate the spreading of COVID-19.¹⁶ During this emergency situation, people are advised to avoid non-emergency visits to healthcare facilities to avoid cross-infection.¹⁷ ADA recommended dentists worldwide to use Teledentistry by audiovisual telecommunication technology and sharing live video, patient radiographs, photographs, digital impressions, etc. between dentists and dental patients without real-time face-to-face contact to limit the spread of COVID-19.¹⁸

Oral health is considered an integral part of our general health which is an essential component of Primary Health Care but it is regularly ignored in the health care delivery system due to a lack of awareness of general people as well as the shortage of manpower like dentists, specialists and infrastructure for service delivery. As a result, oral health-related problems could be solved by minimum intervention even only by preventive approach however, such problems may need to be treated by extensive procedures and sometimes lead to life-threatening complications like oral cancer. So, the aim of the study was to explore the attitudes and interests of dentists and dental patients about Teledentistry for Oral Healthcare Management in Bangladesh.

MATERIALS AND METHODS

In this cross sectional study, we have used both qualitative and quantitative methods. For dental patients, we used a quantitative approach, for this purpose we conducted an online cross-sectional survey during the period from July- December 2021. This online survey was conducted in both rural and urban areas of Bangladesh. We sent our research questionnaire to 300

participants and we got responses from 206 participants. The response rate was 68%. We used a pretested, semi-structured and self-administered questionnaire, consisting of 25 questions to evaluate the attitude and interest of dental patients towards Teledentistry services for oral healthcare management in Bangladesh. Informed written assent and consent were taken from patients prior to taking answers. Data were collected from dental patients who were 18 years or more. All the dental patients willing to participate in this study were considered as inclusion criteria.

For dentists, we used a qualitative approach. We conducted a focus group discussion in Dhaka Dental College Hospital among a group of dentists. We took opinions from twenty dentists' combination of two groups of senior and junior dental consultants. We invited to participate in this study only by practicing dental surgeons to evaluate the attitude and interest of dentists towards Teledentistry services for oral healthcare management in Bangladesh. Data were cleaned, edited and analyzed following the objectives of the study using Statistical Package for Social Science (SPSS) version 26.

RESULTS

The quantitative study was conducted on 206 participants where the majority of the respondents were female (51%), had urban residence (85%), graduate or above educational qualification (64.1%) and were service holders (32%) as shown in Table I.

Table I Socio-demographic characteristics of the respondents

		Percentage
Gender	Male	49.0
	Female	51.0
Residence	Rural	15.0
	Urban	85.0
Educational		
Qualification	Graduate and above	64.1
	Higher Secondary (HSC or equivalent)	28.6
	Secondary (SSC or equivalent)	3.9
	Up to Primary	3.4
Occupation	Homemaker	13.6
	Service holder	32.0
	Student	44.2
	Unemployed	2.4
	Business	4.4
	Others	3.4

Among the 206 participants about half (56.3%) previously consulted with a doctor or dentist via Mobile conversation, Video call, Facebook/ WhatsApp/ Messenger and 94.2% of them found the conversation beneficial. The majority of them (77.2%) used mobile conversation (Table II).

Table II Participants experience about virtual consultation with doctors/dentists

	Percentage
Virtual consultation experience	56.3
Virtual consultation was beneficial to	94.2
Virtual consultation medium	77.2
Mobile conversation	7.3
Video call	15.5
Facebook/ WhatsApp/Messenger	

The figure showed that 74.30% of participants were not satisfied with the present oral and dental service-taking procedures, the majority of them worried (79.60%) about visiting the dentist due to the COVID-19 pandemic and about 91.30% of the participants felt the need of Teledentistry like platform during COVID-19 pandemic. A large portion (89.30%) of the participants considered teledentistry as a time-saving technique and most of them (85.30%) considered teledentistry for better management of oral and dental problems and 82.70% were highly interested in teledentistry for use in future if available in our country. Our study findings showed that 81.6% of participants agreed that teledentistry will improve access to oral health care services in Bangladesh (Figure 3).

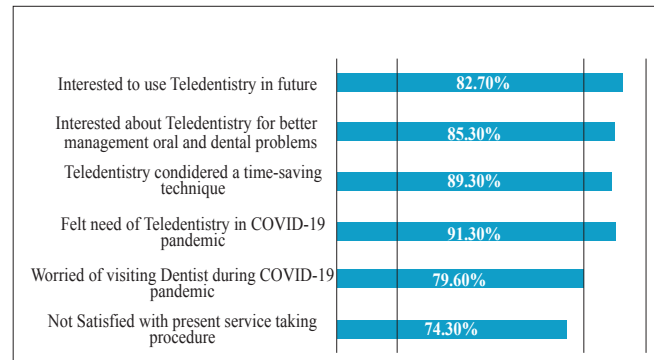


Figure 2 Attitude and interest about Teledentistry

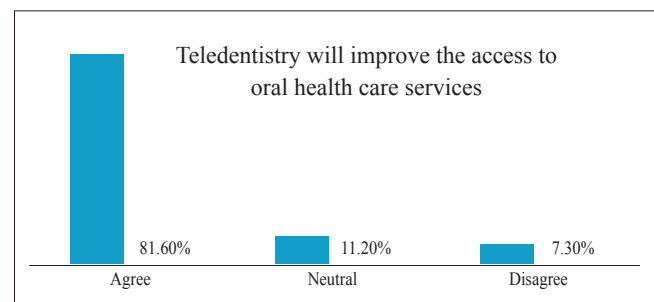


Figure 3 Teledentistry as improving the oral health care services

Table III showed that in respect of participants' interest in Teledentistry for oral health care management and interest in using Teledentistry in the future, there was no significant association found with different socio-demographic characteristics like gender, age, education, residence and occupation which indicating all socio-demographic groups are interested in Teledentistry for oral health care management purposes.

Table III Association among the socio-demographic variables with attitude and interest

	Interested in Teledentistry for oral health care management	Interested in using Teledentistry in the future
Gender	$\chi^2 = 0.723$ p=0.359	$\chi^2 = 0.120$ p= 0.729
Age category	$\chi^2 = 3.812$ p= 0.282	$\chi^2 = 4.919$ p= 0.178
Education	$\chi^2 = 1.048$ p=0.790	Likelihood Ratio = 2.965 p= 0.397
Residence	$\chi^2 = 0.442$ p=0.506	$\chi^2 = 0.889$ p=0.346
Occupation	Likelihood Ratio = 7.127 p=0.211	Likelihood Ratio = 2.144 p=0.829

We conducted a prefixed Focus Group Discussion (FGD) among a group of dentists at Dhaka Dental College Hospital. The discussion was recorded in a recorder and we also took notes in a diary. We conducted our discussion for half an hour. Every dental practitioner both from senior and junior groups of dentists showed a very positive attitude towards Teledentistry. We got a lot of opinions from them. They were highly interested in this topic and also gave their valuable suggestion for the future Teledentistry mobile application. The major opinions of the participants are presented below:

"It is possible to make audio-visual communication with dental patients and dentists. Some of my relatives often contact me over the phone, they send me their images of the diseased portions of the oral cavity. I advised them without facing difficulty except few cases. I think if we generalize Teledentistry services, all classes of people will be benefited."

"Some dental problems are not so serious and need not require any immediate dental procedures. Dental patients can consult with dentists and solve their problems easily by using Teledentistry services."

"In painful and serious conditions, we have to do clinical procedures unless the sufferings of patients will not be minimized. But if patients contact with oral healthcare provider through Teledentistry at an initial condition then the severity can be minimized."

Above mentioned Dentists' opinions showed that Teledentistry could be an appropriate medium for solving emergency dental consultations.

"I think people from remote areas greatly benefit if we start a Teledentistry Service in our country where countrymen are become victims of malpractice by quacks. Then people will consult with a Tele dentist and get a clear idea about their duty."

"Yes, I heard about Teledentistry it has already exist in many countries of the world. I badly feel Teledentistry during lockdown period of COVID-19 pandemic."

"I think Teledentistry will reduce unnecessary visits to dental facilities which is very important in this COVID-19 situation"

Findings of discussions revealed that Teledentistry will be helpful to reduce the distance between dentist and underserved people with dental problems and it will be also convenient in pandemic situation.

We conducted a focus group discussion to assess the attitude & interest of dental patients toward Teledentistry. There were 2 males and one female, all of them living in urban areas. The age of the female was 37 years old. Between two males one of them was 35 years old and another of them was 80 years old. One male and female completed their post-graduation degree and our most aged respondent completed SSC.

Among the three respondents, all of them had oral health-related problems. Two of them had sensitivity in their teeth and one of them had many problems in her teeth she felt the need of Teledentistry because she didn't reach the dentist at the time of her sickness. Her quotation is given below:

"I have so many problems with my teeth. Especially during the lockdown period due to COVID-19, my oral health condition became worsened. I did not get any dentist near to me. In that period if I got any suggestion by the help of Teledentistry it might reduce my suffering and anxiety."

● All the respondents were highly interested in Teledentistry. They told themselves and the general people will benefit a lot if it is sustained in our country. Especially the rural people who are the victim of different types of malpractice, it will be reduced. One of them said:

"We have so many patients in rural areas, because of the scarcity of dentists the village people have to go to the quacks and due to maltreatment, their sufferings are increasing more and more. If we use the teledentistry mobile app then people will get proper suggestions and it will be very beneficial for them. We ourselves will also be benefited by using this."

● Every respondent felt the need for Teledentistry. We informed them Teledentistry has already been established in many countries of the world including our neighboring country India and in the world, the position of Bangladesh is the second in the case of oral cancer and the lack of awareness is a big contributing factor for it. Our respondents said that Teledentistry is the crying need of time in Bangladesh. It will play a great role in creating awareness about oral health-related problems as well as give immediate solutions to many oral health problems. They said:

"Yes, I agree it will be very helpful for us. Which things are good for us and which are harmful if we come to know from the Teledentistry mobile app and it will also improve our awareness about oral health."

"Yes, a comprehensive system should be present in our country which will be very beneficial for us."

● Our respondents were ready to pay if any payment was required after the Tele dental consultation procedure. They believed that they would share clear images and express their problems properly on the Tele dental audio-visual platform. One of them expressed:

“Yes certainly. We will get benefit from it in straying home. So, I am ready to pay for it. I can able to send clear images of my oral problems if required.”

● Although maximum dental treatment requires a physical visit, our respondents believed that it would help them in doing preliminary consultation. It will reduce unnecessary visits, save time and money and relieve them from dental anxiety. Our patients agreed that many patients had fear about dental treatment procedures, if they exchange their opinions before physical visits, it will be effective for them. One of them said:

“Yes, I can do a preliminary consultation with a dentist with the help of the Tele dental platform, he/she will help me to relieve dental anxiety and dental pain. Then if a face-to-face meeting is needed I will go to the dentist at my convenient time.”

So we can say that the attitude and interest of Dental Patients towards Teledentistry is highly positive. Our dental patients expressed that it will bring bright future in the oral health sector of Bangladesh and help to reduce the sufferings of general people regarding oral health issues.

DISCUSSIONS

Oral health problems are very common in all age groups of people and break up the harmony of life. A large portion of people in both urban and rural areas of Bangladesh are deprived of oral health care services due to negligence, wrong perception of the general population about dental problems, lack of awareness about oral health, unaffordability, fear and inaccessibility and as a consequence suffer from life-threatening problems such as oral cancer, with sometimes creates economic burden. After the emergence of COVID-19, the situation is more critical as the oral cavity is the main source of the coronavirus. Dental treatment requires very close contact, so both dentists and dental patients are at risk for COVID-19 cross-contamination. In this situation, many countries of the world have used Teledentistry to minimize dental visits and reduce the chance of infection.

Regarding the attitude and interest of dentists and dental patients towards Teledentistry services for oral healthcare management in Bangladesh we have identified the following points -

i) A large number of dental patients (74.3%) were not satisfied with the present oral and dental service-taking procedure, a major portion (89.3%) of the participants considered Teledentistry as a time-saving technique and 92.7% were highly interested in Teledentistry for using in future if available in our country.

ii) All socio-demographic groups irrespective of their gender, age, education, residence and occupation were interested in Teledentistry for oral health care management purposes ($p > 0.05$).

iii) The majority of the dentists showed a positive attitude and they are highly interested in Teledentistry service in Bangladesh.

iv) Dentists believe that Teledentistry will increase accessibility to oral health care for everyone and eliminate the inequality in oral health services among the urban, rural and under privileged populations.

v) The severity of oral and dental problems can be minimized by proper utilization of Teledentistry like digital platforms as suggested by dentists.

vi) Dentists felt badly in need of Teledentistry during of COVID-19 pandemic which will reduce unnecessary visits to dental facilities.

Bangladesh has about 17 crore mobile phone connections and 41 percent of mobile phone users have smartphones. It is estimated that by 2025 about 62% of the mobile phone users in Bangladesh will have smartphones. So it is a great opportunity for us to develop such a smartphone-based platform that will be able to facilitate the users specially the patients having oral and dental problems for better management in Bangladesh.¹⁹

CONCLUSION

In Bangladesh, the dentist-population ratio is really disappointing. The oral health-seeking behavior of dental patients is very poor and the overall awareness is little regarding this. The findings of this study will create a pathway and act as a guideline to develop technology-based services called Teledentistry like telemedicine which will be highly beneficial for dental patients, especially for rural people and will increase awareness about oral health.

DISCLOSURE

All the authors declared no competing interest.

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