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Knowledge and attitude toward COVID-19 and dental treatment - Its availability and treatment satisfaction during the pandemic among adult population - An online survey

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Abstract:

BACKGROUND: Corona virus disease 2019 (COVID-19) is a highly infectious disease primarily spreading through droplet infection which require significant restriction and modification in dental treatment. This study aims to assess the knowledge and attitude of adult population toward COVID-19 and dental treatment and to assess the availability of dental treatment and patient satisfaction during the time of pandemic.

MATERIALS AND METHODS: An online survey was conducted using self-designed electronic questionnaire consisting knowledge and attitude about COVID-19 and dental scenario and questions regarding availability of dental treatment received during the time of pandemic. Knowledge scores were assessed on a maximum total score ranged from 0 to 8, and descriptive statistics were done for questions related to attitudes and dental treatment availability.

RESULTS: A total of 495 participants with mean age of 36.6 years participated in the study. The mean knowledge score was 7.12 ± 0.99 and the participants were found to have good awareness and positive attitude regarding COVID-19 were as considerable number of participants were unaware about the risk associated with dental treatment as well as restrictions imposed on dental procedures. About 18% of participants experienced one or other form of dental complaints during the lockdown period. 4% of participants had no accessibility to any form of treatment.

CONCLUSIONS: Public awareness is to be improved regarding risk of cross infection that can be associated with dental treatment and public should be motivated to use virtual facilities like tele-dentistry so that no dental emergencies is left untreated, at the same time avoiding any sort of unnecessary hospital visit during the pandemic time.

Keywords:

Attitude, availability, coronavirus disease 2019, dental treatment, knowledge, oral health

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Introduction

Coronavirus disease 2019 ("COVID-19") caused by novel coronavirus SARS-COV2 evolved as a highly infectious severe respiratory disease which was first detected in December 2019 in Wuhan, China. The main clinical symptoms include

fever, dry cough, fatigue, myalgia, and dyspnea.^[1] This outbreak was declared as a Public Health Emergency of International Concern by the WHO on January 30, 2020, and characterized as pandemic on March 11, 2020.^[2] The disease is found to be spread through respiratory droplets from an infected person by coughing and sneezing and on contacting inanimate objects onto

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which these droplets have settled. Social distancing and regular hand hygiene are found to be the methods for prevention of COVID-19.^[3]

Most of the initial COVID-19 cases in India were evolved in the people with prior foreign visits including China, Italy, USA, UK, Iran, Japan, South Korea, and so on. Even with initial precautions, COVID-19 cases continued to increase in India and social contact-based cases started evolving which resulted in a number of casualties where the victim gets the infection from direct or indirect contacts. The country went on complete lockdown since March 24, 2020^[4] which was extended periodically till June 30 followed with a phased plan to unlock India. A regular and rapid increase in the spread of this disease was observed in our country in following days with the number of confirmed cases nearing 3.32 lakh, with the death toll approaching the 10,000 mark as on June 15, 2020.^[5]

As social distancing is the recommended method to prevent the community spread of this disease the Government of India have put strict restrictions on travelling. It is recommended to avoid unnecessary visits to the hospitals including dental clinics because of the chances of cross infection. Dentists and associated health-care providers come in close contact with the patients and their saliva. Dental procedures can produce aerosols, and which can be contaminated by the virus and this makes dental clinics a potential risk area for cross infection. According to the home ministry's guidelines, patients in containment zone can seek ambulance services to travel to the nearby COVID dental facility. In the red zone, emergency dental procedures can be performed, while clinics in orange and green zone should function to provide dental consults. Dental operations are restricted to emergency and urgent procedures. All routine and elective dental procedures are deferred for a later review until new policy/guidelines are issued.^[6] New methods of consultations like tele-dentistry are encouraged as to prevent the direct contact between the patient and the doctor.

To improve the availability and quality of oral health-care delivery system, it is necessary to get an overview of knowledge and attitude toward the same in general population.^[7] Many studies have conducted on the public awareness regarding COVID-19 pandemic, but only a few studies have focused on the role of public regarding their accessibility of dental treatment and difficulties faced by them due to restrictions imposed on dental treatment. We aim to assess the knowledge and attitude of adult population toward COVID-19 and dental treatment and to assess the availability of dental treatment and patient satisfaction during the time of pandemic.

Materials and Methods

Study design – Cross-sectional online survey

This online survey was conducted by the faculty of Department of Oral Medicine and Radiology, Government Dental College Kottayam, Kerala, and the study participants included Indian citizens residing in and outside Kerala. The duration of the study was from May 29 to June 7, 2020, the week immediately after unlock phase 1 was started in India.

A self-designed electronic questionnaire was designed consisting of sociodemographic questions, questions based on knowledge and infection control practices related to COVID-19 disease adapted from a previous research^[1] and information for general public published by the Centre for Disease Control^[8] as well as questions related to dental practice awareness and availability of treatment during the time of pandemic. The questionnaire consisted of four main themes: (1) demographics, which survey the participants' sociodemographic information, including gender, age, country of residence and occupation, (2) knowledge about COVID-19 and dental scenario, (3) attitudes toward COVID-19 and dental consultations, and (4) questions regarding availability of dental treatment as well as treatment satisfaction received during the time of pandemic. Participants were given "true," "false," or "not sure" response options to these items. A correct response to an item was assigned 1 point, while an incorrect/not sure response was assigned 0 points. Regarding knowledge related questions, the first 6 were related to COVID-19 transmission and infection control and the next 2 were regarding dental treatment risk knowledge during the pandemic time. The maximum total score ranged from 0 to 8, with values above or equal to 4 indicating better knowledge. The questions were translated into local language Malayalam also for better understanding by the participants. Subject experts evaluated the validity and ambiguity of the questionnaire. Prior to the data collection, the questions were pretested among a sample population to ensure the reliability.

Sampling

Subjects who were willing to participate will be recruited for the study. A convenience sampling of internet users was used for the study through creating an online survey portal, Google Form[®]. The survey link was shared in social media platforms such as WhatsApp[®] and Facebook[®] as well as in platforms such as Survey Circle and the responses received for 1 week was included in the study.

The institutional ethical committee clearance was obtained prior to starting the study and informed consent was taken from all participants prior to data collection.

The confidentiality of the subjects was ensured during all phases of study.

Statistical analysis

Data entered were evaluated from Google spreadsheet and analysis was done using IBM SPSS Statistics for Windows, version 23 (IBM Corp., Armonk, NY, USA). The knowledge score was calculated from a total of 8 points. The mean score was compared and a score above the median value was considered good knowledge. Mann-Whitney U-test to understand was used to compare knowledge scores between the sociodemographic variables. Descriptive statistics were described for the questions related to attitudes and dental treatment availability.

Results

Sociodemographic characteristics of the study population

A total of 511 participants completed the survey questionnaire. After excluding 16 responses which were incomplete, a total of 495 cases were used for final data analysis.

The age of the patients ranged from 18 to 83 with a mean \pm standard deviation [SD] of 36.6 ± 12.8 years. There was slight female predominance in the survey participation with male:female ratio of 1:1.3. Majority of the participants were Indian residents and negligible increase in participation of urban residents compared to rural population. The sociodemographic details of the study population are summarized in Table 1.

Knowledge score

The maximum knowledge score was 8. The mean \pm SD knowledge score was 7.12 ± 0.99 , with a range of 4–8. Knowledge on COVID-19 consisted 6 questions. The range of the knowledge score of the participants was from 4 to 6 with a mean \pm SD as 5.7 ± 0.5 . Knowledge regarding dental treatment had 2 questions and its mean \pm SD score was 1.37 ± 0.8 .

The study indicated that 98.4% of the population was having good knowledge regarding COVID-19. However, a significant percent of the population is ignorant regarding the risk as well as restrictions associated with dental treatment during the pandemic [Table 2].

There was no significant difference in the COVID-19 knowledge scores across age groups, gender, categories of occupation or place of residence whereas regarding dental treatment, significant difference in scores was observed between age groups, occupation, and country of residence ($P < 0.05$) [Tables 3 and 4].

Attitudes toward coronavirus disease 2019 and dental treatment

More than half of the respondents agreed that COVID-19 will finally be successfully controlled (65%) [Figure 1]. The attitude toward the final success in controlling COVID-19 had no significant differences across sociodemographic factors (P value not significant).

Figure 2 shows the attitude and practice toward dental visit. More than half of the respondents (57.2% females and 61.8% males) reported that they would only visit the dentist when they have dental complaints. Majority of the participants agreed with the restrictions imposed on dental treatment and believed that it is essential to control the spread of infection [Figure 3].

Dental needs and treatment availability

Of the 495 participants, 18% participants had experienced some dental problems during the lockdown period, among which only about 4% were able to do a dental consultation during the time. Only 53 (10.7%) participants

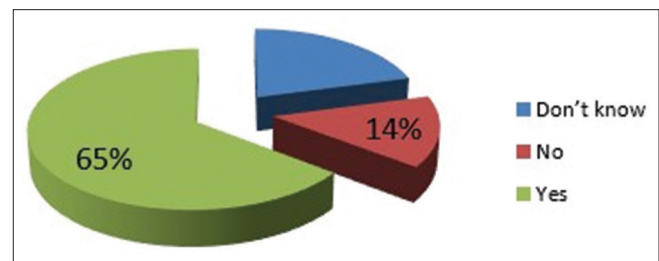


Figure 1: Attitude of participants on whether coronavirus disease 2019 will be successfully controlled

Table 1: Sociodemographic characteristics of study participants

Characteristics	Frequency (%)
Age (years)	
<30	164 (33.1)
30- 39	177 (35.8)
40- 49	79 (16.0)
50- 59	34 (6.4)
>60	41 (8.3)
Gender	
Male	257 (51.9)
Female	238 (48.1)
Country	
India	437 (88.3)
Outside India	58 (11.7)
Area	
Rural	243 (49.1)
Urban	252 (50.9)
Occupation	
Salaried	313 (63.2)
Self-employed	56 (11.3)
Unemployed	47 (9.5)
Student	79 (16.0)

Table 2: Knowledge of participants on coronavirus disease 2019 and dental treatment during coronavirus disease 2019

Question number	Knowledge on COVID-19	Correct answer (%)
1	The COVID-19 virus spreads via respiratory droplets of infected individuals	483 (97.6)
2	Do you think social distancing is essential to stop the virus spread?	489 (98.8)
3	Proper handwashing with soap prevents the spread of COVID-19	488 (98.6)
4	If handwashing is critical to prevent the spread of viruses like COVID-19, what is the minimum duration of handwashing to kill most of the germs?	487 (98.4)
5	Public can wear ordinary masks to prevent the infection by the COVID-19 virus	406 (82.0)
6	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	488 (98.6)
Question number	Knowledge on dental treatment during COVID-19 pandemic	Correct answer (%)
7	Are you aware of the risk of transmission of COVID-19 virus during dental treatment procedures?	369 (74.5)
8	Are you aware of the restrictions imposed on dental treatment during COVID-19 pandemic?	311 (62.8)

COVID-19=Coronavirus disease 2019

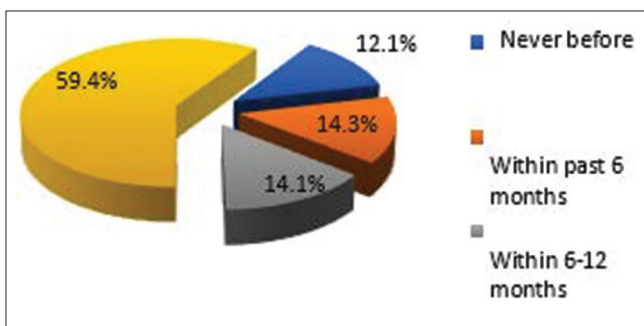


Figure 2: Attitude toward dental visit

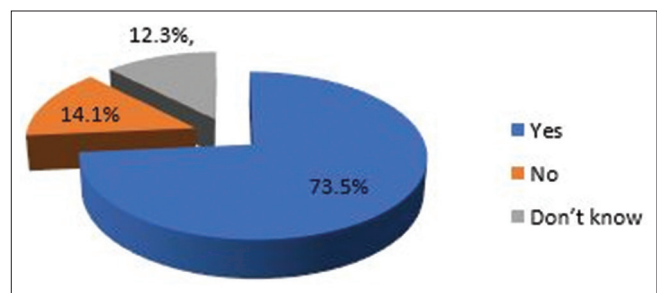


Figure 3: Attitude of participants on dental treatment during the time of pandemic being restricted to emergency treatment only

visited a dental facility after lockdown relaxations were implemented. Among the 53 participants, 51 (96.2%) participants were satisfied with the infection control measures including handwashing and social distancing implemented in the dental setting and 47 (88.7%) were able to get the required treatment [Table 5].

Discussion

As far as we know, this is the first preliminary online survey to examine the knowledge and attitude regarding COVID-19 along with considering the dental awareness as well as treatment needs and accessibility of the population during the pandemic time. Participants from all adult age categories were included, with majority in the salaried and self-employed groups denoting a well settled or good socioeconomic background. More than 98% of the participants were found to have a very good knowledge of COVID-19 with mean overall score of 5.7. This indicates the effectiveness of public information measures and advisories issued by government and health organizations during the rapid rise period of the COVID-19 outbreak. Previous studies from different part of the world have identified good knowledge in infection control as a predictor of good practice.^[1,9,10]

However, a considerable number of participants were unaware about the risk associated with dental treatment

as well as restrictions imposed on dental procedures. It is now believed that interpersonal transmission of SARS-CoV-2 occurs mainly through respiratory droplets and contact transmission but there are controversies regarding whether SARS-CoV-2 can be spread through aerosols.^[11,12] Dental procedures are unique in that a large number of droplets, splatter and aerosols could be generated and the standard protective measures in routine treatment plan are not effective enough to prevent the spread of COVID-19, especially considering rise in asymptomatic COVID cases or when patients are in the incubation period or those who choose to conceal their infection susceptibility. The comparatively poor knowledge among the study participants regarding dental precautions suggests the need for awareness in these aspects also. Participants above the age of 50 years held higher dental related knowledge scores, possibly due to a higher risk perception of contracting the disease and associated poor prognosis.

More than half of the participants (65%) had positive attitudes toward overcoming COVID-19. This is likely to have influence cautions with majority avoid visiting crowded places, maintain social distancing, and wearing face mask. High levels of positive attitudes were also detected in the knowledge, attitude, and practice study conducted in China^[1] and Malaysia.^[9] The authors attributed the positive attitudes to the drastic measures

Table 3: Association of knowledge on coronavirus disease 2019 with baseline characteristics

Characteristics	Knowledge score on COVID-19			P
	Mean±SD	Minimum- maximum	n	
Overall score	5.7±0.5	4- 6	495	
Age				
<30	5.7±0.5	4- 6	164	0.93
30- 39	5.7±0.5	4- 6	177	
40- 49	5.7±0.5	4- 6	79	
50- 59	5.8±0.4	5- 6	34	
≥60	5.8±0.4	5- 6	41	
Gender				
Male	5.8±0.5	4- 6	257	0.21
Female	5.7±0.5	4- 6	238	
Country				
India	5.8±0.5	4- 6	437	0.61
Outside India	5.7±0.5	5- 6	58	
Area				
Rural	5.8±0.5	4- 6	243	0.62
Urban	5.7±0.5	4- 6	252	
Occupation				
Salaried	5.8±0.5	4- 6	313	0.77
Self-employed	5.7±0.5	4- 6	56	
Unemployed	5.8±0.4	5- 6	47	
Student	5.7±0.5	5- 6	79	

*P<0.05 significant. SD=Standard deviation, COVID-19=Coronavirus disease 2019

Table 4: Association of knowledge on dental treatment with baseline characteristics

Characteristics	Knowledge score on dental treatment			P
	Mean±SD	Minimum- maximum	n	
Overall score	1.37±0.8	0- 2	495	
Age				
<30	1.32±0.8	0- 2	164	0.02
30- 39	1.28±0.8	0- 2	177	
40- 49	1.47±0.8	0- 2	79	
50- 59	1.65±0.6	0- 2	34	
≥60	1.56±0.7	0- 2	41	
Gender				
Male	1.43±0.8	0- 2	257	0.07
Female	1.31±0.8	0- 2	238	
Country				
India	1.41±0.8	0- 2	437	0.004
Outside India	1.10±0.8	0- 2	58	
Area				
Rural	1.38±0.8	0- 2	243	0.95
Urban	1.37±0.8	0- 2	252	
Occupation				
Salaried	1.37±0.8	0- 2	313	0.03
Self-employed	1.30±0.8	0- 2	56	
Unemployed	1.66±0.6	0- 2	47	
Student	1.25±0.8	0- 2	79	

*P<0.05 significant. SD=Standard deviation

taken by the government in mitigating the spread of the virus. In India also, the rapid and vigilant actions taken by the state and central government have also contributed in slowing the rate of progression and spread

of disease. By creating credible sources of information at every level, we need to debunk myths and break down stereotypes that feed fear and misinformation within communities.

Regarding the attitude towards dental visit, almost 60% visited dentist only when they are symptomatic. This is in accordance with the results in previous reports from India.^[13,14] The lack of awareness about the maintenance of good oral health and regular visits to a dentist could be a possible explanation. Majority believe that dental diseases are not serious as reported by over half of the population. Hence, there is a need for increasing awareness and encouraging more positive attitudes toward oral health in the same population. In correlation with the knowledge score regarding risk associated with dental treatment, 74% believe that dental treatment should be restricted to emergency procedures only during the time of pandemic. The governing bodies should consider restarting nonemergency procedures only after monitor trends in local case counts and risk of community transmission. Because transmission patterns can change, dental personnel should also stay updated about local transmission trends.

Eighteen percent participants experienced one or other form of dental complaints during the lockdown period. Four percent of participants had no accessibility to any form of treatment. In India, mostly the dental health care is looked after by the private sector and individual practices including nonformal medical facilities.^[15] Most of the private clinics were not functioning during the lockdown period. Even though government facilities are available from secondary or tertiary level onward, lack of proper dental treatment access at primary level can deny treatment availability in rural areas. In our study, telephonic consultation provided by dental personnel (7.8%) contributed for emergency management of acute dental problems. This signifies the need for better options like tele-dentistry^[16] in the present scenario.

During the post lock down period, according to the Dental Council of India directory released on April 16, 2020, dental clinics must strictly follow all protocols to decontaminate, disinfect and sterilize at the clinics as prescribed and dental personnel must use appropriate personnel protective equipment for providing treatment. Any failure to follow these measures will impact to societal health catastrophically. Majority of our respondents who had dental visit during post lock down period are satisfied with the infection control precautions established in dental settings.

Limitations

The study is limited to the people who had internet access, smartphones or those obviously in the middle

Table 5: Utilization of dental services and patient satisfaction during coronavirus disease 2019 pandemic

Question number	Questions and response	Frequency (%)
1	Have you experienced any dental problems during lockdown?	
	Yes	89 (18.0)
	No	403 (81.4)
2	Do not want to disclose	3 (0.6)
	What type of dental consultation was available during the emergency phase?	
	Telephonic	34 (6.8)
	Consultation with medical doctor	12 (2.4)
	Dentist consultation at hospital	22 (4.4)
3	No treatment was available	20 (4.0)
	Not applicable/not wish to disclose	407 (82.2)
	Did your problem get subsided following the consultation?	
	Yes	61 (12.3)
	No	27 (5.5)
4	Not applicable	407 (82.2)
	Are you satisfied with the type of dental care received during the emergency phase?	
	Yes	66 (13.3)
5	No	22 (4.4)
	Not applicable	407 (82.2)
	Have you visited a dental setting after lockdown relaxations were implemented?	
6	Yes	53 (10.7)
	No	442 (89.3)
7	Were you satisfied with the infection control measures including handwashing and social distancing implemented in the dental setting?	
	Yes	51 (10.3)
	No	2 (0.4)
8	Not applicable	442 (89.3)
	Were you able to get the required treatment received during the visit?	
	Yes	47 (9.5)
9	No	6 (1.2)
	Not applicable	442 (89.3)

and higher socio-economic status due to the method used for collecting data. Hence, we speculate that it should not be generalized to the whole population. A more systematic, inclusive sampling method is warranted to improve representativeness and generalizability of the findings.

Conclusions

We attempted to provide a comprehensive examination of the knowledge and attitudes of adult population in the country toward COVID-19 as well as dental scenario during the time of pandemic. The findings suggest that majority of the population have an adequate knowledge on COVID-19 and are generally positive in their outlook on overcoming the pandemic. However, public awareness is to be improved regarding risk of cross infection that can be associated with dental treatment and public should be motivated to use virtual facilities like tele-dentistry so that no dental emergencies is left untreated but at the same time, avoiding any sort of unnecessary hospital visit during the pandemic time.

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Conflicts of interest

There are no conflicts of interest.

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