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RATIONALE FOR ANXIETY ASSOCIATED WITH DENTAL VISITS DURING THE COVID-19 PANDEMIC AMONG THE GENERAL PUBLIC – AN OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND. The effect of COVID-19 on various facets such as physical, psychological, financial, social, and so on has been investigated extensively. However, the wariness influencing the decision to visit the dentist during this pandemic has received relatively little attention in Indian scenario. The study sought to investigate the general public's anxiety regarding visiting a dentist during the COVID-19 pandemic, including the factors that possibly contribute towards this apprehension among Indian nationals.

METHODS. Structured questionnaire based cross sectional observational study. Completed responses were received from 259 individuals. Information was collected on demographic details, medical history, history of COVID-19 infection, history of dental problems, anxiety associated with dental visit and reason for dental visit during the pandemic, whether vaccinated and expecting the dentist to be vaccinated. Apprehension or concerns regarding dental visits were acquired via nine closed-ended questions with dichotomous responses.

RESULTS. During the pandemic, 25.9% had dental problems, 24.7% visited the dentist and 81% were anxious about dental visits. 72.6% were concerned about contracting infection from the clinic, 81.5% were concerned about contracting infection in the waiting area, and 87.3% were concerned about whether the clinicians/assistants would meticulously follow standard operating protocols, 88% were concerned about disinfection between patients and 75.7% expressed concern on higher treatment charges due to the pandemic.

CONCLUSIONS. The general public is concerned about disease transmission in the dentist's office and increased treatment costs, both of which could have a negative impact on the use of dental services during this COVID-19 pandemic.

Key words: *COVID-19, psychological impact, dental visits, pandemic*

INTRODUCTION

The ongoing COVID-19 pandemic has created a public health disaster affecting both the mental and the physical health of individuals, as well as economic slowdown in approximately 220 countries around the world (1, 2). On December 8th, 2019 the first case of the virus was reported in Wuhan (Hubei Province), China, and the causative agent was identified as the novel corona virus. The respiratory disease was referred as "COVID-19" and the virus was named "SARS-CoV-2" by the international committee on virus taxonomy and the disease was declared as a pandemic by the WHO on 11th march 2020 (3, 4).

Coronaviruses are positive-sense RNA viruses that are spherical, enveloped, and non-segmented. Individuals who are symptomatic, asymptomatic carriers, infected patients in the incubation period,

and patients in the recovery period all spread the disease. Several modes of transmissions have been proposed, including direct contact with an infected person and respiratory droplets and aerosols, as well as indirect transmission via contaminated objects and surfaces (5, 6).

The dental clinic is an ideal setting for bidirectional transmission of the virus between the dental team and the patients due to close proximity, direct contact with saliva and blood, contact with contaminated surfaces and instruments and the usage of aerosol generating procedures (AGP) (7-9). Health care workers, especially the dentists, are at a higher risk of contracting the infection. The high rate of spread and fatality that has resulted, as well as the knowledge that family members at home can be infected has placed greater worry and concern in dentists' minds (10-12). Nonetheless, the psychological impact isn't just restricted to the health

care and other frontline workers, in fact the general public's psyche has been harmed as well, with many expressing anxiety, despair, frustration, loneliness, loss of control, paranoia, insomnia, suicidal ideation, and hostility as a result of the disease per se and the lockdown/quarantine imposed (3, 14).

People are scared of contracting the infection, hospitalisation cost, isolation/confinement without social support, stigmatisation, death due to COVID-19 and the fear of being denied respectful religious final rites without their loved ones. Everything aforesaid, combined with financial hardship, job insecurity, "infodemic" worry created by the media has created considerable psychological distress among the population. In a nut shell, the pandemic has created a disproportionate uncertainty in everyone's life in terms of physical and mental health, employment, and existence in general (13, 14).

The effect of COVID-19 on various facets such as physical, psychological, financial, social, and so on has been investigated extensively. However, the wariness/concerns influencing the decision to visit the dentist during this pandemic have received relatively little attention in Indian scenario. Therefore, the present study sought to investigate the general public's anxiety regarding visiting a dentist during the COVID-19 pandemic, including the factors that possibly contribute towards this apprehension among Indian nationals.

MATERIALS AND METHODS

The current pilot online survey questionnaire study was conducted from April 17th to May 7th, 2021. It was intended to be a cross-sectional observational study. The study's execution was approved by the institutional review board (SRMU/M&HS/SRMDC/2021/S/012). The study by Jiang et al. in 2020 (15) was used for sample size calculation. The parameter used was 87.1% risk for getting infected with COVID-19 in the dental clinic. A sample size of 170 was arrived at with 95% confidence interval and 5% type 1 error. The study is reported in accordance with the STROBE guideline.

A pretested structured questionnaire was created in Google Form and distributed via WhatsApp and e-mail. Remainder was sent for completion of the survey and complete confidentiality regarding the responses was maintained. Exponential non-discriminative snow balling sampling technique was followed. The purpose of the study and the willingness to participate were queried about in the first section of the survey form, and the subjects were given the option to stop or terminate filling out the form at any point of time. The questionnaire takes about 5-8 minutes to complete. Subjects above the age of 18 years, both the genders, with fluency in English language, access to smart

phone with WhatsApp installed and or laptop/desktop with internet facility were requested to participate in the survey. Subjects with physical disabilities and mental health problems were not included as the former can have issues with accessing the dental office and the later can affect the reliability of the responses. To evaluate the face validity the questionnaire was circulated among dentist, dental students and general public and minor corrections were made.

The survey form was divided into two sections. In the first section the details collected were: background characteristics (age, gender, educational qualification, occupation, income), medical history (presence of systemic diseases such as diabetes, hypertension, cardiovascular problems, asthma, ulcers, and other medical problems), whether tested positive for COVID-19 in the past, history of dental problems during the pandemic and whether they visited the dentist along with the reason for visit during the pandemic (multiple options were given), vaccination history, whether they expected the dentist to be vaccinated and whether they would feel anxious if they have to visit a dentist. In the second section, nine closed-ended questions with dichotomous responses as yes or no were structured to elicit respondents' apprehension/concern about dental visits during the pandemic, as well as the issues that possibly contributed to their apprehension/concern (Table 1).

Statistical analysis

The Google form responses were automatically entered into an excel sheet. The raw data was statistically analysed using IBM SPSS statistics for windows, version 26.0, Armonk, NY: IBM Corp, released 2019. The descriptive statistics of the data set was summarised as frequency and percentage distribution. The Pearsons Chi-squared test of independence was applied to test the relationship between the variables. If any expected cell frequency was less than five then Fischer's exact test was used. The probability (P) value was considered significant if ≤ 0.05 (5%).

RESULTS

The survey form was completed by 259 people, so all the responses were used for statistical analysis. The average age of the respondents was 33.5 ± 11.5 years, with men accounting for 51% of the study population and women accounting for 49%. The majority of respondents, 57.1%, had completed their degree or diploma, while 3.5% had only completed their school education. Furthermore, 66.4% were employed and worked either physically at their workplaces, from home, or as self-employed individuals. Nearly 54.5% earned more than 20,000 Indian rupees, while 28.1%

Table 1. Factors contributing to anxiety/concern regarding dental visits during COVID-19 pandemic

Q	Concerns / Anxiety of the patients	Responses	N	%
1	Are you concerned about contracting or getting infected with corona virus from your dentist or the from the people working at the dental clinic?	No	71	27.4%
		Yes	188	72.6%
2	Are you concerned whether the dental clinic you visit will be fully prepared to prevent the spread of COVID-19?	No	33	12.7%
		Yes	226	87.3%
3	Are you concerned about getting infected with corona virus from other patients at the waiting area?	No	48	18.5%
		Yes	211	81.5%
4	Are you concerned that the dentist you visit will wear proper mask, gloves, head cap, face shield, follow proper hand sanitation?	No	33	12.7%
		Yes	226	87.3%
5	Are you concerned about the disinfection/sterilization of the instruments to be used on you?	No	23	8.9%
		Yes	236	91.1%
6	Are you concerned whether the clinic treatment/waiting area will be disinfected between patients?	No	31	12.0%
		Yes	228	88.0%
7	Are you concerned about the increase in treatment charges following COVID-19 pandemic?	No	63	24.3%
		Yes	196	75.7%
8	Are you concerned about the availability of digital payment?	No	87	33.6%
		Yes	172	66.4%
9	Are you concerned whether any corona positive case would have been treated in the dental clinic?	No	72	27.8%
		Yes	187	72.2%

did not. When their overall health was assessed, it was observed that 8.5% and 5.8% of them had hypertension and diabetes, respectively. Almost 11.2% were affected by several other systemic diseases which were not detailed in the questionnaire. 81% said they would be anxious if they had to go to the dentist. Furthermore, 10.8% of them had previously tested positive for COVID-19.

During the pandemic, 25.9% had dental problems, and 24.7% (64) ended up going to the dentist (Figure 1). Those who visited had multiple treatments, so their responses were overlapping. 37 (57.8%) visited for pain/trauma/fractured teeth/endodontic problems, 26 (40.6%) had scaling and gum treatment, 8 (12.5%) had missing teeth replaced, and 15 (23.4%) had restorations. When questioned, it was discovered that 64.1% expected their dentist to be vaccinated if they planned a dental visit, and 19.7% were vaccinated (Table 2).

The survey revealed that overwhelming majority of the respondents was significantly apprehensive about visiting a dentist during these uncertain pandemic times. The responses to the closed ended questions on the factors that were bothering them and making them anxious regarding dental visits revealed that 72.6% were concerned about contracting infection from the clinic, 87.3% were sceptical whether the dental practise setup would be adequately prepared to prevent the spread of infection, 81.5% were concerned about contracting infection in the waiting area, and

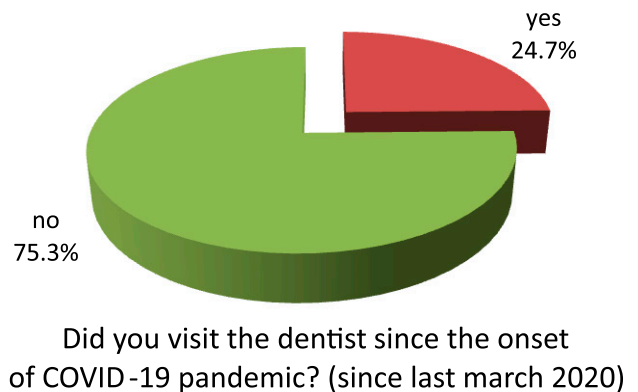


Figure 1. The frequency distribution of individuals visiting the dentist since the onset of COVID-19 pandemic

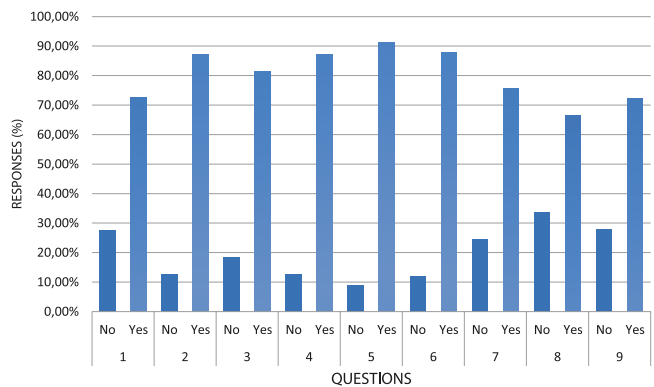


Figure 2. Bar diagram depicting the factors contributing to anxiety regarding dental visits during COVID-19 pandemic

Table 2. Frequency and percentage distribution of the variables collected using the questionnaire

VARIABLES		N	%
Gender	Male	132	51.0%
	Female	127	49.0%
Education	School	9	3.5%
	Degree / Diploma	148	57.1%
	Post graduate	102	39.4%
Occupation	Not working	27	10.4%
	Employed	124	47.9%
	Self employed / business	27	10.4%
	Working from home	21	8.1%
	Student	50	19.3%
	Retired	10	3.9%
Income	Nil	66	28.1%
	< 10,000	10	4.3%
	10,001 - 20,000	31	13.2%
	> 20,000	128	54.5%
Medical problems	Diabetes	15	5.8%
	Hypertension	22	8.5%
	Asthma	3	1.2%
	Peptic ulcer	16	6.2%
	Cardiovascular problem	10	3.9%
	Other medical problems	29	11.2%
Did you get infected with corona virus?	No	231	89.2%
	Yes	28	10.8%
Did you experience any dental problem since the onset of COVID-19 pandemic?(since last march 2020)	No	192	74.1%
	Yes	67	25.9%
Did you visit the dentist since the onset of COVID-19 pandemic? (since last march 2020)	No	195	75.3%
	Yes	64	24.7%
Will you feel anxious if you have to visit the dentist during the pandemic?	No	49	19%
	Yes	210	81%
Do you expect your dentist to be vaccinated if you plan for a dental visit?	No	93	35.9%
	Yes	166	64.1%
Did you get vaccinated?	No	208	80.3%
	Yes	51	19.7%

87.3% were concerned about whether the clinicians/assistants would meticulously follow standard operating protocols, 88% were concerned about disinfection between patients and 72.2% were worried about whether COVID-19 positive cases had already been treated in the clinic. Regarding the cost of treatment, nearly two-thirds (75.7%) of those surveyed expressed concern and anticipated higher treatment charges due to the pandemic and 66.4% preferred digital payments and were anxious as to whether the clinic would support cashless transactions (Table 1, Figure 2).

Table 3 shows that there were no significant differences in respondents' levels of concern based on their age, educational level, or previous infection with the Corona virus. However, there was a significant gender disparity, with women being more anxious about visiting a dentist during the epidemic than men. Regardless of vaccination status, respondents were concerned about equipment sterilisation ($P=0.05$) and disinfection methods between patients ($P=0.04$). Those who experienced dental issues during the pandemic had similar concerns about the aforementioned factors ($P=0.003$ and $P=0.02$ respectively). People who visited the dentist during the pandemic were concerned about

Table 3. Chi-squared test of association between A. Patient concerns regarding dental visits during COVID-19 pandemic and the variables; B. Visiting the dentist and experiencing dental problems during the COVID-19 pandemic

	Age group P-value	Gender P-value	Education P-value	History of vaccination P-value	Did you get infected with corona virus? P-value	Visit to dentist since the onset of pandemic? P-value	Dental problems since the pandemic P-value	
Q1	0.90	0.006*	0.96	0.29	0.45	0.64	0.664	
Q2	0.11	0.002*	0.69	0.24	0.54	0.008*	0.054	
Q3	0.43	0.006*	0.63	0.16	0.26	0.75	0.87	
Q4	0.38	<0.001*	0.69	0.10	0.99	0.07	0.51	
Q5	0.06	0.006*	0.59	0.05	0.48	0.004*	0.003*	
Q6	0.48	0.018*	0.63	0.04	0.54	0.104	0.028*	
Q7	0.21	0.010*	0.53	0.21	0.57	0.389	0.66	
Q8	0.19	0.484	0.59	0.34	0.30	0.87	0.65	
Q9	0.18	0.080	0.90	0.18	0.72	0.37	0.40	
Did you visit the dentist since the onset of COVID-19 pandemic? (Since last march 2020)				Did you experience any dental problem since the onset of COVID-19 pandemic? (Since last march 2020)				P-value <0.001*
No 195 (75.3%)		Yes 64 (24.7%)		No 192 (74.1%)		Yes 67 (25.9%)		

*P≤0.05 was considered statistically significant; P>0.05 was non-significant

Table 4. Frequency distribution of the respondents with systemic medical problems and the Pearsons chi-squared test for association between systemic illness and the factors

Rationale for anxiety / apprehension	Diabetes YES/ NO	Hypertension YES/ NO	Asthma YES/ NO	Ulcer YES/ NO	Cardiac related problems YES/ NO	Other diseases YES/ NO
	15/244	22/237	3/256	16/243	10/249	29/230
Chi-squared association test (P-values)						
Q1	0.99	0.62	0.56	0.15	0.73	0.98
Q2	0.70	0.17	0.99	0.43	0.99	0.99
Q3	0.99	0.57	0.46	0.18	0.99	0.48
Q4	0.70	0.49	0.99	0.70	0.99	0.55
Q5	0.13	0.42	0.99	0.99	0.99	0.08
Q6	0.69	0.31	0.31	0.99	0.99	0.54
Q7	0.76	0.39	0.99	0.54	0.70	0.98
Q8	0.26	0.08	0.00	0.83	0.80	0.75
Q9	0.56	0.66	0.99	0.15	0.03*	0.68

*P≤0.05 was considered statistically significant; P>0.05 was non-significant

the disinfection of instruments (P=0.008) and the dental practice's adherence to SOP and guidelines (P=0.004).

With the exception of those with cardiovascular disorders, where substantial anxiety was noted if positive COVID-19 cases had previously been treated in the clinic (P=0.03), the findings revealed no variations in apprehension depending on the presence or absence of systemic illness (P≥0.05) (Table 4).

DISCUSSION

The COVID-19 pandemic has wreaked havoc across the globe and is still raging on with no signs of abating for the time being. Globally, health-care systems have collapsed due to the rapid spread of cases and acute scarcity of resources, as well as overburdened health-care workers. Since the onset of the pandemic, there has been a decrease or delay in

seeking necessary health care treatments, follow-up visits, and emergency department utilisation, as well as an increase in tele-consultations (16, 17).

Concerns about disease transmission and infection have impacted dental services as well with patients both delaying and avoiding dental treatments. Postponed dental care during the pandemic has been linked to poor oral health, which has been linked to COVID-19 complications with consequent negative impact on systemic health (18-20). As the pandemic is expected to endure for some time, it is critical to address patients' fears or concerns, ensuring that suitable measures are taken to guarantee that the dentist office is considered as a safe place to get treatment. As a result, the focus of this research was to assess public concerns regarding dental appointments during the epidemic.

The outcomes of this cross-sectional study revealed that there is widespread public concern about dental visits during the current COVID-19 outbreak in India. Nearly 81% of them stated going to the dentist would make them nervous, and 72.6% were concerned about catching an infection from the dental clinic. In a similar online poll conducted in Kerala, 74.5% of respondents said there was a considerable possibility of disease transmission during dental procedures (21). Moffat et al. reported similar findings among adults in the United States, where it was felt that protecting one's general health from COVID-19 infection was more important than dental consultations, treatments, and vaccinations could enhance dental visits (22). On the contrary, 87.2% of patients attending the dentistry unit of AIIMS in Delhi were unconcerned about infection spread, while only 37.3% were concerned (23).

Majority of the respondents visited the dentist for emergency purposes in this survey and this is corroborated by other Indian studies (21, 24). For instance, Britta Hahn et al., reported an approximate 50% reduction in patients presenting with dental emergencies in a German University dental hospital (25). In an online survey, 46.7% of US individuals said that they had postponed dental visits due to the pandemic, with 74.7% indicating they had postponed their routine dental consultation, examination, and scaling (22).

During the pandemic, women were more anxious and concerned about dental visits than men. Jiang et al. (15) and Kranz et al. (26) found similar results in Chinese and US adults, respectively. This could be attributed to women's more anxious, overly cautious, and stressful nature. Gonzales-Olmo et al. (27) and Upendra Singh et al. (23) on the other hand, found no such gender differences in infection fear and use of dental services during the pandemic.

The study findings also revealed that 81.5% and 88%, respectively, were concerned about waiting in the

dental clinic and about whether clinic personnel will comply with proper disinfection protocols between patients. Upendra Singh et al., conveyed similar concerns, stating that 40.5% surveyed did not want to wait for extended periods of time and preferred tele-consultations (23). Correspondingly, a study conducted among Spaniards by Gonzales-Olmo et al. found that longer waiting times, being treated as the last patient, elderly patients older than 60 years, and the presence of systemic illness increased the vulnerability to infection. On the contrary, 91.6% of Spaniards were unconcerned about acquiring infection from a dental office, and 90.1% would not cancel appointments for fear of infection (27).

The respondents in this study expressed concern about increased treatment costs as a result of COVID-19, which has been substantiated by other studies (24, 28). This could perhaps be one of the reasons for less dental visits. Patients aren't the only ones who are struggling financially; dentists are also being forced to raise charges for a variety of reasons, including fewer appointments in a day, higher costs for PPE kits and other infection control equipment, and shorter working hours. As a result, both the government and private parties must work together to strengthen the financially strained health-care system.

Small sample size, convenience sampling, and the fact that only individuals with smart phones were able to complete the questionnaire were the study limitations. Hence, the sample is not representative of the total population, and the results cannot be generalised.

CONCLUSIONS

Based on the findings of the survey, it can be inferred that the general public is concerned about disease transmission in the dentist's office and increased treatment costs, both of which could have a negative impact on the use of dental services during the current pandemic. Furthermore, at the height of the epidemic, death rates were so high that staying at home was the utopian objective, and dental treatments would seem insignificant. Consequently, there may be a drop in dental visits unless for emergency circumstances until patients are given confidence that the dentist office is a safer environment and the dental team is strictly implementing the guidelines and regulations set by the regulatory bodies. This can be executed by scheduling a tele-consultation prior to the actual appointment and explaining/demonstrating the protocols followed in the dental office, display the vaccination certificates of the entire dental team and finally assuring a completely safe treatment environment. Mass media and social media can also be utilised to create awareness regarding

the importance of oral health and dental visits during this pandemic. Therefore, it is the dentist's obligation to safeguard and treat patients while also avoiding disease transmission and establishing patient faith in the dental team's ability to keep them safe from infection.

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