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Impact of COVID-19 on dental care utilization, among patients visiting a dental hospital in north Bangalore: A cross sectional study

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Abstract

Towards the end of 2019, Wuhan, China, reported the novel corona virus disease (COVID-19), characterized by symptoms of fever and pneumonia. COVID-19 pandemic in turn affected the whole world in ways that were not anticipated. The Corona Virus Disease of 2019 (COVID-19) was declared a pandemic by the Director-General of WHO on March 11, 2020. The fear of contracting COVID 19, because of its novel and rapid transmission, could make individuals hesitant to visit public places like medical and dental hospitals and clinics, due to which dental clinics & hospitals have been observing a massive decline in the number of patients visiting these facilities, which can be attributed to the increased worry/fear of the public towards risk of transmission of this disease from dental procedures.

Aim: This study aims to assess the impact of Covid-19 on dental care utilization among patients visiting a dental hospital in Bangalore city.

Methods: A questionnaire-based cross-sectional study was conducted among patients visiting Krishnadevaraya College of Dental sciences and Hospital. The pretested closed-ended questionnaire was administered by interview method to 159 patients visiting the outpatient department of the dental hospital.

Results: A total of 159 subjects participated in the study, of which 59.1% (94) were Males & 40.9% (65) were females. Pain was the main reason the subjects visited the dental hospital 39.6% (63). Majority of the subjects 59.7% (95) did not fear contracting COVID-19 from the hospital, whereas 40.3% (64) subjects had a fear of contracting the virus from the dental hospital.

Conclusion: The findings of this study suggests that there is a significant association between the fear among patients visiting the dental hospital and the safety precautions being followed at the dental hospital.

Keywords: cross-sectional, males, closed-ended

Introduction

Towards the end of 2019, Wuhan, China, reported the novel corona virus disease (COVID-19), characterized by symptoms of fever and pneumonia ^[1]. COVID-19 pandemic in turn affected the whole world in ways that were not anticipated. The sudden onset of the virus and its influence on life has forced people ranging from households to executives and public policy makers experience numerous uncertainties and fear about one's health, finances, career and life ^[2]. The Corona Virus Disease of 2019 (COVID-19) was declared a pandemic by the Director-General of WHO on March 11, 2020. Literature suggests that COVID-19 virus is transmitted mainly through droplet (particles diameter $\geq 5 \mu\text{m}$) inhalation generated when an infected patient coughs or sneezes, and also when direct contact occurs with oral, nasal and eye mucous membranes of infected individuals. Infection through droplet transmission occurs when a person is in close proximity (within 1 m) with someone who has respiratory symptoms like coughing, sneezing etc. ^[3]. The fear of contracting COVID 19, because of its novel and rapid transmission, could make individuals hesitant to visit public places like medical and dental hospitals and clinics, due to which dental clinics & hospitals have been observing a massive decline in the number of patients visiting these facilities, which can be attributed to

the increased worry/fear of the public towards risk of transmission of this disease spread infections to the dentist as well as other people in the dental office. The days following the COVID-19 outbreak, health authorities of almost all cities instructed dental establishments to suspend all non-emergency dental treatment while providing emergency dental services only [4]. Social contact which was the main factor causing the spread of the COVID-19 infection was restricted through enforcing lockdown measures resulting in decreased public mobility. Stringent confinement measures enforced on the general public in high risk areas were shown to have the potential to slow down the spread of COVID-19 [3]. Researchers also reported a drastic decline in even medical consultations as well during the lockdown period. Under such circumstances, ignoring the oral health and avoiding professional dental care is without doubt expected to be extreme in a country like India, where dental health is usually not considered a priority by the majority. To the best of our knowledge, there is a dearth in literature observing the changes in extent and pattern of utilization of dental services in India following COVID-19 outbreak. Hence the present study was conducted to assess the impact of COVID-19 on dental care utilization [5].

Materials and Methods

This observational study focused on the outpatient emergency care unit, to assess the impact of Covid-19 on dental care utilization among patients visiting a dental hospital in Bangalore city. The questionnaire-based cross-sectional study was conducted at Krishnadevaraya College of Dental sciences, Bengaluru. Ethical approval to conduct the study was obtained from the Institutional Review Board of Krishnadevaraya College of Dental Science, Bengaluru. Convenience sampling was used to meet the required sample size based on the patients visiting the outpatient section of the dental college for 1 month. A pilot study was carried out among 30 participants to assess the feasibility and applicability of the questionnaire. Minor changes were made in the questionnaire following the pilot study. The reliability statistics obtained for the questionnaire using Cronbach's alpha was at 0.84 indicating good internal consistency. Patients could visit the emergency care irrespective of taking any prior appointment. Primary care was performed, and if necessary, patients were directed to different dental specialty departments for further care. The urgent care unit presented a favourable and dependable setting to analyze the flow of patients through the course of the national lockdown and after it. The teaching wing of the college substituted patient treatment with phantom head simulation to guarantee students of their safety and hence was omitted. The patients were instructed on the importance of maintaining hygiene and social distancing during the pandemic, before entering the emergency care unit of the college. Each patient was then assessed for the potential risk of spreading SARS-CoV-2 infection, using a questionnaire before entering the clinic. They were asked if they suffered from symptoms indicative of COVID-19, if they had recently travelled to a COVID-19 affected area, or if they have had been in close contact with a COVID-19 patient. The patient's temperature was measured at the triage station situated at the entrance of the emergency care unit. If the patient responds to the questionnaire with a positive answer or is screened with an increased temperature, the patient was prescribed necessary medication and asked to return after 14 days.

The patients who screen negative for COVID-19 were asked

from dental procedures [2]. Published Evidences suggest that many dental procedures produce aerosols and droplets that harbour bacteria, viruses, and other microorganisms, which has the potential to

of their reason for attending the dental hospital before being admitted to the emergency care section. These reasons were recorded and later categorized as pain, broken tooth or restoration, trauma, follow-up appointment etc. On completion of the dental procedure, the dentist administered a questionnaire to assess the reason for visiting the dental hospital, dental problems the patient faced during the lockdown period, their fear of contracting COVID-19 from the dental hospital and their satisfaction with the safety measures being followed in the dental hospital to prevent the spread of COVID-19. The pretested closed-ended questionnaire was administered to 159 patients by interview method.

Statistics

The sample size was calculated using the

$$\frac{z^2 \times p(1-p)}{e^2} \div 1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)$$

formula $N = \frac{z^2 \times p(1-p)}{e^2}$. N=Total number of expected samples (250), e=Margin of error (absolute precision) (d) = 5% (0.05), p=Percentage value (Expected proportion of samples meeting the criteria)-50%, Z at 95% CI=1.96. Substituting the values in the formula final sample size obtained was 155. Convenience sampling was used to meet the required sample size based on the patients visiting the outpatient section of the dental college for 1 month. A pilot study was carried out among 30 participants to assess the feasibility and applicability of the questionnaire. Minor changes were made in the questionnaire following the pilot study. The reliability statistics obtained for the questionnaire using Cronbach's alpha was at 0.84 indicating good internal consistency.

Results

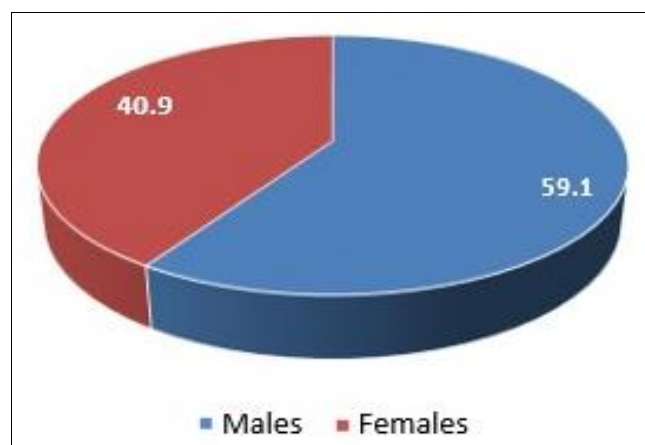


Fig 1: Gender distribution of the study participants

The mean age of the participants in the current study was 29.69±9.538. Majority of the participants were males 59.1% (94), and 40.9% (65) were females. The mean age of males in the study was 29.91±9.86, while the mean age of females in the study was 29.35±9.11.

Table 1: Study participants based on education

Education	Frequency	Percentage
< High School	0	0

High School	7	4.4
Pre-University	17	10.7
Graduate	69	43.4
Postgraduate	7	4.4
Not disclosed	59	37.1
Total	159	100

Table 1: Study participants based on education: Education Frequency Percentage < High School 0 0 High School 7 4.4 Pre-University 17 10.7 Graduate 69 43.4 Postgraduate 7 4.4 Not disclosed 59 37.1 Total 159 100

Table 2: Study participants last visit to the dental hospital

Previous Dental Visit	Frequency	Percentage
Before COVID- 19	61	38.4
During COVID- 19	40	25.2
First ever dental visit	58	36.5
Total	159	100

Table 3: Study participant’s reason for visiting the dental hospital

Reason for previous dental visit	Frequency	Percentage
Pain	63	39.6
Cleaning	47	29.6
Orthodontic treatment	25	15.7
Teeth replacement	15	9.4
Routine check-up	9	5.7
Any other	0	0
Total	159	100

Table 3 describes the distribution of study participants based on their visit to the dental hospital. 38.4% (61) subjects visited the dental hospital previously before the emergence of the COVID-19 pandemic, whereas 36.5% (58) study subjects reported that they are visiting the dental hospital for the first time. Table 4 describes the distribution of study population

based on their reason for visiting the dental hospital. 39.6% (63) study subjects visited the dental hospital due to dental pain, which accounted for the majority, followed by reasons like getting teeth cleaning done 29.6% (47), Orthodontic treatment 15.7% (25), teeth replacement 9.4% (15) and for routine dental check-ups 5.7% (9).

Table 4: Dental problems experienced and treatment seeking during lockdown among study participants

Dental diseases experience during lockdown	Frequency	Percentage
Yes	28	17.6
No	114	71.7
Had dental problem, but did not visit dentist due to fear of COVID-19	17	10.7
Total	159	100

Table 5: Treatment administered during lockdown among study participants visiting the dentist

Dental visit during lockdown	Management	Frequency	Percentage
Visited the dentist	Prompt treatment	11	39.3
	Prescribed medications and recalled on a later date	17	60.7
	Total	28	100
Not visited the dentist	Self- medication	6	35.3
	Natural remedies	4	23.5
	Tele-consultation with a dentist	7	41.2
	Total	17	100

Table 5 describes the distribution of study population based on dental problems experienced during the lockdown period. Majority of the study 71.7% (114) subjects did not experience any dental problems during lockdown period. 17.6% (28)

subjects experienced dental problems during this period, whereas, 10.7% (17) subjects had dental problems, but did not visit a dentist due to fear of contracting COVID-19.

Table 6: Study participant’s reason for fear of contracting COVID-19 from the dental hospital

Reason for fear of contracting COVID-19 in a dental hospital	Frequency	Percentage
Crowding in the hospital.	14	21.9
Insufficient Precautions being taken at the hospital	16	25.0
Both the above	34	53.1
Total	64	100

Table 6 describes the distribution of subjects who experienced dental problems during the lockdown period and sought professional help for the same. A total of 28.3% (45) study subjects experienced dental problems during the lockdown period of which, 62.2% (28) visited a dentist for their dental problem. Only 39.3% (11) subjects received prompt treatment to resolve their dental issues, whereas 60.7% (17) subjects reported that, they were prescribed medications for temporary relief from the dental issue and was recalled on a later date by the dentist. 37.7% (17) subjects, despite having dental issues, refused to physically consult a dentist due to fear of

Table 7: Association between study participants fear of contracting COVID-19 from the hospital with factors like satisfaction with overall safety precautions, satisfaction with safety precautions before starting treatment, delay in treatment due to safety precautions and treatment satisfaction

		Fear of contacting COVID-19						Chi- square	P-value
		Yes		No		Total			
		N	%	N	%	N	%		
Satisfied with overall safety precautions before being permitted to enter hospital	Yes	40	25.2	24	15.1	64	40.3	7.680	0.009*
	No	78	49.1	17	10.7	95	59.7		
Delay in treatment being provided due to safety precautions	Yes	47	29.6	17	10.7	64	40.3	5.692	0.020*
	No	52	32.7	43	27.0	95	59.7		
Satisfied with treatment being provided following safety precautions	Yes	31	19.5	33	20.8	64	40.3	11.500	0.001*
	No	71	44.7	24	15.1	95	59.7		

Discussion

The present study was conducted to assess the impact of COVID-19 on dental care utilization among patients visiting a Dental hospital in North Bangalore. A total of 159 subjects participated in the study, of which 59% were males and 41% were females. In the present study, it was found that, 40% subjects visited the dental facility due to pain, which was similar to studies conducted by Shrestha. A *et al.* (2020) & Guo H *et al.* (2020), where, 44.7% subjects visited dental facilities due to pain. 28% (45) subjects in the present study experienced some sort of dental problem during the lockdown period, and among this, 62% subjects sought professional help to combat their dental problem, whereas 38% subjects resorted to measures like self- medication, natural remedies and tele-consultation with a dentist to resolve their dental emergency [6]. It can be said with confidence that, more emphasis should be placed on imparting awareness about tele-dentistry among the masses, so that this facility can be utilized to the fullest during this pandemic age and basic dental concerns of the patients are dealt with. 60% subjects in the present study reported that they did not fear contracting COVID-19 from the dental hospital, which was in contrast to a study conducted by Jiang Y *et al.* (2020) where, 97.4% study subjects reported that they felt the dental visits carried a risk of them getting infected [7]. This difference might be due to the fact that the study by Jiang *et al.* was conducted during the early days of the pandemic, where the illness was a relatively new concept to the public and instilled a sense of fear and panic. Among those who feared contracting the virus from the hospital, crowding along with insufficient safety precautions (53%) was the major reason for this fear according to the present study, whereas in the study conducted by Jiang Y *et al.*, 80% of the subjects. reported fear of potential pandemic in the hospital due to the above mentioned factors. It is a well-known fact that Media coverage of corona virus news during geographical lock downs, extended quarantines, and financial and social hardships induced fear and caused psychological stress [8]. But, it comes with its benefits as the media allowed for timely interventions by the Centre for Disease Control And Prevention (CDC) and the World Health Organization

contracting COVID-19 and resorted to possible solutions to alleviate their dental issues like self-medication 35.3% (6), Natural remedies 23.5% (4) and Tele-consultation with a dentist 41.2% (7). There was statistically significant association (p -value < 0.05) between the subjects fear of contracting COVID-19 from the dental hospital and their satisfaction with the overall safety precautions being followed before being permitted to enter the dental hospital (p -value=0.009). Similarly, there was a statistically significant association (p -value.

(WHO), enabling a rapid and widespread reach of public health communications, ultimately leading to upward trend for the promotion of health and hygiene practices worldwide by adoption of safe health practices such as increased hand washing, use of face coverings, and social distancing. 74% subjects in the present study reported that they were satisfied with the general safety precautions in place such as a detailed inquiry into the subjects travel history, interaction with any person who has tested positive for COVID-19 in the near past, followed by their temperature and oxygen saturation being screened before being granted access inside the dental hospital [9]. This was in par with a study conducted by R. Izzetti *et al.* (2020) which explicitly mentions the importance of patient triage and investigating the risk of exposure to COVID-19, following which, the patients were allowed to visit the dental office only if the entire questionnaire is negative [10]. Majority of the participants in the present study, i.e. 64% (102) reported satisfaction with the treatment being provided at the dental hospital with all the necessary precautions being followed by the doctor which includes disinfection of the treatment area prior to starting the treatment, performing hand hygiene, utilization of Personal Protective Equipment (P.P.E), instilling a sense of safety in the minds of the patients [11]. Study participants have visited the dental institution prior to the onset of the pandemic and the visible changes in the working protocol of the dental hospital owing to the pandemic, beginning from the strict screening, hygiene and social distancing measures to the precautionary measures taken by the clinician till the treatment is completed may have instilled a sense of safety in the minds of the participants [12]. There was a significant association between the subjects fear of contracting COVID-19 from the hospital with factors like satisfaction with overall safety precautions, satisfaction with safety precautions before starting treatment, delay in treatment due to safety precautions and treatment satisfaction [13-17]. This can be attributed to the fact that the influence of media has made people aware about the transmission routes of the virus and as mentioned before, the important safety measures that has to be followed to prevent further risk of transmission of the infection, thus instilling in their mind a feeling of relief on seeing the

precautionary measures from the moment of entry to the dental hospital till the completion of treatment and vice versa. As further research is being conducted on the virus, the medical sector is coming up with more enhanced strategies and methods to combat the effects of this deadly virus^[18]. This in a way helps ease anxiety among some sections of the public as well, since the use of social media magnifies information which are scientifically absurd and misleading, contributing to unnecessary panic among a few, with another few overlooking the whole situation. The present study comes with its limitations. The study used convenience sampling technique and focused only on one dental hospital in Bangalore city, hence limiting the generalizability of the results obtained.

Conclusion

A total of 159 subjects participated in the study, of which 59.1% (94) were Males & 40.9% (65) were females. Majority of the study subjects had a graduate degree. 43.4% (69). Pain was the main reason the subjects visited the dental hospital 39.6% (63). Majority of the subjects 59.7% (95) did not fear contracting COVID-19 from the hospital, whereas 40.3% (64) subjects had a fear of contracting the virus from the dental hospital. To conclude, the findings of this study suggests that there is a significant association between the fear among patients visiting the dental hospital and the safety precautions being followed at the dental hospital. This association can be attributed to the awareness instilled in the minds of the general population by media influences, especially social media. The dynamics of transmission of the infection and the essential safety precautions that need to be followed to prevent this are well understood by the public, hence instilling a feeling of relief and safety in the minds of those seeking treatment from the dental hospital.

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