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## **Original** Research

# Impact of covid-19 on health and financial status, practice and attitude and views of dentists in Pune city – A questionnaire based cross-sectional study

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### ABSTRACT:

Background: Numerous dental clinics have been forced to close due to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV2high)'s contagiousness as well as the fact that dental operations frequently produce blood and saliva droplets that could spread the illness. The current study was conducted to evaluate the impact of COVID-19 on health and financial status, practice and attitudes and views of dentists in Pune city. Methods: In Pune city, a questionnaire survey will be administered to general dentists and specialists. 30 questions and 5 parts make up the survey. In the first segment, there were some basic demographic facts. Closed questions (yes/no questions) about the dentists' perception and its impact on their physical health make up the second segment. Financial status-related questions are asked in the third part. Questions about the shift in dental practice brought on by the COVID-19 epidemic are included in the fourth section. The survey's fifth question assesses dentists' attitudes and perspectives on the outbreak using a 5-point Likert scale. Results: Overall, 187 dentists contributed to this study. There was significant variance for the questions that evaluated the responses for the Dentists' opinion and its effect on their physical health, Financial status and change in dental practice due to COVID-19 pandemic and the 5-point Likert-scale scoring to evaluate dentists' attitudes and views on the outbreak. Categorised on the basis of the field of dentistry for the question of Dentists' opinion and its effect on their physical health there was no significant variance between the various fields of dentistry except for the response of the question Take COVID-19 test for all patients where the P=0.006. Conclusion: Employees in the dental healthcare industry are most at risk of getting COVID-19. Therefore, during the pandemic, dental professionals should follow the established protocols more carefully. To lessen the danger of COVID-19 transmission, they could also cut back on their work schedules and only perform dental procedures as an absolute last resort. Additionally, in order to reduce the danger of infection, public organizations should supply the dental professionals with the necessary equipment.

Keywords: COVID-19, Pandemic, Dentistry, Dental practice

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### **INTRODUCTION**

The novel beta corona-virus disease 2019 (COVID-19) outbreak started in Wuhan, China's Hubei province, in December [1]. The virus has already spread throughout the entire world, disrupting every aspect of daily life. The signs and symptoms of the coronavirus infection known as SARS-CoV-2 are comparable to those of earlier coronavirus infections. These include a fever, dry cough, and fatigue, but the SARS-CoV-2 is more contagious [2]. The virus could be transmitted orally, through the mucous membranes of the mouth, eyes, and nose, and even through respiratory droplets and contaminated surfaces [3, 4]. Due to the virus's high contagiousness, many medical facilities have decided to postpone all elective procedures in order to reduce the risk of infection. During dental procedures, blood and saliva droplets are inevitably produced by the use of handpieces and ultrasonic instruments [5]. As a result, these droplets might contaminate the office setting and dental equipment. Therefore, it is possible for dental professionals and patients to contract microbial pathogens [6, 7]. In this regard, researchers noted that dental clinics might be a potential trans- mission source of viruses like the hepatitis B virus (HBV) and the human immunodeficiency virus (HIV), which could spread to both patients and practitioners during dental procedures [8, 9]. The American Dental Association (ADA) advised dental practitioners to restrict their interventions to emergency treatments due to the SARS-CoV2 virus's high contagiousness and the fact that dental procedures frequently produce blood and saliva droplets, which contribute to the virus's spread [10]. In addition, to lower the risk of infection during the pandemic, strict precautionary protocols must be followed. For instance, dentists and their assistants should frequently disinfect the dental instruments in addition to regularly giving patients pre-procedural mouthwash [11]. High volume saliva ejectors, antiretraction handpieces, rubber dam isolation, and personal protective equipment (PPE) should all be used in addition to reduce the risk of transmission [11. 121.

China's COVID-19 first surfaced in December 2019. It quickly turned into a global catastrophe from a Chinese-only national issue. 6 India experienced its first case that was formally documented on January 27, 2020. India declared a national lockdown on March 24, which caused the entire nation to come to a standstill. 7,8 Every facility except the emergency medical facilities was shut down during the first wave of the pandemic during this time. The government suspended non-essential services and only allowed people to move for essential services during this time. It is known that SARS-CoV-2 can spread through the air or through respiratory droplets. 9 Direct or indirect spray can cause mucous membrane damage or inhalation damage, making a person vulnerable. 9 Contaminated surfaces may increase cross infection by contacting mucosal membranes directly or indirectly. 10 According to Occupational Safety and Health Administration (OSHA) guidelines, dentists are in the very high-risk category for nosocomial infection due to the nature of their work, which involves close proximity to the oral cavity and aerosolized procedures. 11 Furthermore, dental professionals have a difficult time protecting themselves from the virus because infection spreads through asymptomatic people. New laws went into effect in dental settings all over the world during COVID-19. 12 The Government of India's Ministry of Health and Family Welfare established thorough health care standards for medical professionals, which were continually updated in accordance with international standards. In order to comply with the new guidelines, dental professionals had to modify their dental procedures. 13 Tele-dentistry and teleconsultation were on the rise during the pandemic and may soon play a significant role in dentistry. It could have significant effects on a field that has historically

depended on frequent patient-doctor communication. Shorter treatment times and social isolation have also changed how we provide patient care. Researchers have been working nonstop for the past year to learn more about this virus, its potential effects, and treatment options, which has led to rapidly evolving knowledge and recommendations. As a result, the COVID-19 vaccine was created, comorbidities were studied in relation to the illness, and simple preventative measures like mask use were adopted. 15–17 The current study was conducted to evaluate the impact of COVID-19 on health and financial status, practice and attitudes and views of dentists in Pune city.

### METHODS

### STUDY DESIGN AND POPULATION

A questionnaire survey was carried out amongst the general dentists and specialists residing in Pune city. The survey includes 30 questions and 5 sections. The first section included primary demographic data. The second section consists of closed questions (yes/no questions) about the dentists' opinion and its effect on their physical health. The third section consists of questions based on financial status. The fourth section consists of questions regarding the change in dental practice due to COVID-19 pandemic. The fifth section of the survey is based on the 5-point Likert-scale scoring to evaluate dentists' attitudes and views on the outbreak.

The dentists were asked to participate in the study via the internet (e-mail or social media) and asked to distribute the survey among the other colleagues at their convenience. The study protocol was approved by the Medical Ethics Committee. The participants have voluntarily involved in this study and written informed consent was obtained. They were assured that no personal information is required, and their filled data would be kept confidential. An online questionnaire using Google Forms was used to collect the data.

### **QUESTIONNAIRE**

The preliminary draft of the questionnaire was designed for the present study based on experts' opinions and guidance from relevant literature [17, 18]. The experts above and a skilled statistician evaluated the face and content validity of the questionnaire. The content of the survey was also verified in terms of the topic concepts. Therefore, the biased, confusing, guiding, and double questions were omitted. We pilot tested the questionnaire on a sample of 20 dentists.

SAMPLE SIZE CALCULATION Sample Size for Frequency in a Population

Population size(for finite population correction factor or fpc)(N):100000Hypothesized % frequency of outcome factor in the population (p):86% + /-5Confidence limits as % of 100(absolute +/- %)(d):86% + /-5

Design effect (for cluster s	urveys-DEFF):		1
Sample Size(n) for Various	s Confidence Levels		
·			
Confidence	Level(%)	Sample Size	
95%		185	

### Equation

Sample size  $n = [\text{DEFF*Np}(1-p)]/[(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]]$ Based on the above calculation a sample of 185 was finalised.

### DATA GATHERING AND STATISTICAL ANALYSIS

The results were compiled by a skilled individual who was not aware of the participants' names or academic backgrounds. Tables and graphs have been made using Microsoft Excel sheets. The extracted data was checked for accuracy by two researchers. Descriptive statistical analysis was used to describe the investigation's objects. A P value of 0.05 or higher was regarded as statistically significant when using the Chi-square test to determine whether there was any significant correlation between the parameters. Software known as Statistical Package for the Social Sciences (SPSS) version 22.0 was used to perform the calculation.

### RESULTS

### 1. PRIMARY DEMOGRAPHIC DATA

Overall, 187 dentists filled the questionnaire with male and female distribution of 31:69 percent; the mean age of  $27.4011\pm5.37163$  years and the experience of  $4.0267\pm4.61115$  years. Out of 187 study participants 98 were General dentistry (52.4%), 3 were Public Health Dentistry (1.6%), 5 were from Oral medicine and Radiology (2.7%), 13 were from Oral and Maxillofacial surgery (7%), 9 were Periodontics (4.8%),16 were from Conservative Dentistry and Endodontics (8.6%), 10 were from Pedodontics (5.3%), 16 were from Orthodontics (8.6%), 15 were from Prosthodontics (8%) whereas 2 were from Oral Pathology (1.1%). (Table 1).

Table	1:	distri	ibution	of the	participants	

		Frequency	Percent
Gender	Male	58	31.0
	Female	129	69.0
Field of	General dentistry	98	52.4
Dentistry	Public Health Dentistry	3	1.6
	Oral medicine and Radiology	5	2.7
	Oral and Maxillofacial surgery	13	7.0
	Periodontics	9	4.8
	Conservative Dentistry and Endodontics	16	8.6
	Pedodontics	10	5.3
	Orthodontics	16	8.6
	Prosthodontics	15	8.0
	Oral Pathology	2	1.1
	Total	187	100.0

### 2. DENTISTS' OPINION AND ITS EFFECT ON THEIR PHYSICAL HEALTH

Response of study participants for the question of rise in phone calls from patients showed that 38 responded yes with 73.8%, 38 responded no with 20.3% and 11 participants responded not applicable as answer 5.9% it was statistically significant with p value >.000. Response of study participants for the question Visited high-risk patients showed that 86 responded yes with 46%, 90 responded no with 48.1% and 11 participants responded not applicable as answer 5.9% it was statistically significant with p value >.000

Response of study participants for the question Had symptoms of COVID-19 showed that 61 responded yes with 32.6%, 123 responded no with 65.8% and 3 participants responded not applicable as answer 1.6% it was statistically significant with p value >.000

Response of study participants for the question Had a

positive test for COVID-19 showed that 29 responded yes with 15.5%, 157 responded no with 84% and 1 participant responded not applicable as answer 0.5% it was statistically significant with p value >.000.

Response of study participants for the question Your assistants had symptoms of COVID-19 showed that 43 responded yes with 23%, 117 responded no with 62.6% and 27 participant responded not applicable as answer 14.4% it was statistically significant with p value >.000

Response of study participants for the question Your assistants had a positive test of COVID-19 showed that 27 responded yes with 14.4%, 132 responded no with 70.6% and 28 participant responded not applicable as answer 15% it was statistically significant with p value >.000. **table 2** 

It was also evident that when the when the Response of study participants according to field of dentistry for the question of Dentists' opinion and its effect on their physical health there was no significant variance between the various fields of dentistry except for the

response of the question Take COVID-19 test for all patients where the P=0.006.

				-		
Table 2: Dentists'	opinion :	and its	effect	on their	physical	health

		Frequency	Percent	p Value
A rise in phone calls from patients	Yes	138	73.8	.000
	No	38	20.3	
	Not applicable	11	5.9	
Visited high-risk patients	Yes	86	46.0	.000
	No	90	48.1	
	Not applicable	11	5.9	
Had symptoms of COVID-19	Yes	61	32.6	.000
	No	123	65.8	
	Not applicable	3	1.6	
	Total	187	100.0	
Had a positive test for COVID-19	Yes	29	15.5	.000
	No	157	84.0	
	Not applicable	1	.5	
	Total	187	100.0	
Your assistants had symptoms of COVID-19	Yes	43	23.0	.000
	No	117	62.6	
	Not applicable	27	14.4	
	Total	187	100.0	
Your assistants had a positive test of	Yes	27	14.4	
COVID-19	No	132	70.6	
	Not applicable	28	15.0	
	Total	187	100.0	

### 3. FINANCIAL STATUS AND CHANGE IN **DENTAL PRACTICE DUE TO COVID-19** PANDEMIC

Response of study participants for the question Implemented the latest guidelines about doing dental procedures during the COVID-19 pandemic showed that 177 responded yes with 94.7%, 6 responded no with 3.2% and 4 participant responded not applicable as answer 2.1% it was statistically significant with p value >.000.

Response of study participants for the question Had problem with providing personal protective equipment (PPE) showed that 91 responded yes with 48.7%, 84 responded no with 44.9 % and 12 participant responded not applicable as answer 6.4% it was Table 3

statistically significant with p value >.000

Response of study participants for the question Received help from a public organization for providing PPE showed that 35 responded yes with 18.7%, 143 responded no with 76.5% and 9 participant responded not applicable as answer 4.8% it was statistically significant with p value >.000. Response of study participants for the question Performed non-emergency procedures showed that 173 responded yes with 92.5%, 14 responded no with 3.2% and 4 participant responded not applicable as answer 2.1% it was statistically significant with p value >.000. No significant variance was seen for the Used another source of income for daily expenditure question and Performed non-emergency procedures.

Question	Response	Frequency	Percent	P Value
Received help from a public organization	Yes	35	18.7	.000
for providing PPE	No	143	76.5	
	Not	9	4.8	
	applicable			
	Total	187	100.0	
Increased in the use of PPE while	Yes	169	90.4	
performing dental procedures	No	11	5.9	
	Not	7	3.7	
	applicable			
	Total	187	100.0	
Performed non-emergency procedures	Because of the	173	92.5	0.820
	patients' request			
	Because of financial	14	7.5	
	problems			

	Total	187	100.0	
Changed the dental practice standards	Focus on preventive	59	31.6	
-	care			
	Not performing	62	33.2	
	Unnecessary treatment			
	Reducing the	66	35.3	
	treatment sessions			
	Total	187	100.0	
A decrease in income	Yes	123	65.8	.000
	No	17	9.1	
	Not applicable	47	25.1	
	Total	187	100.0	
Implemented the latest guidelines about	Yes	177	94.7	.000
doing dental procedures during the	No	6	3.2	
COVID-19 pandemic	Not	4	2.1	
	applicable			
	Total	187	100.0	
Had problem with providing personal	Yes	91	48.7	.000
Protective equipment(PPE)	No	84	44.9	
	Not	12	6.4	
	applicable			
	Total	187	100.0	
Changed in working time and dental	Yes	146	78.1	.000
practice	No	36	19.3	
	Not	5	2.7	
	applicable			
	Total	187	100.0	
Received financial help from a public	Yes	8	4.3	.000
organization	No	148	79.1	
	Not	31	16.6	
	applicable			
	Total	187	100.0	
Used another source of income for daily	Yes	48	25.7	0.147
expenditure	No	99	52.9	
	Not	40	21.4	
	applicable			
	Total	187	100.0	
Encountered with financial problems	Upto 2months	35	18.7	.000
	Upto 6	44	23.5	
	months			
	Upto a year	54	28.9	
	Never	54	28.9	
	Total	187	100.0	

### 4. 5-POINT LIKERT-SCALE SCORING TO EVALUATE DENTISTS' ATTITUDES AND VIEWS ON THE OUTBREAK

For all the questions of "Phone call is effective to resolve patient's dental problems, Phone call is effective to resolve patient's dental problems, Examine the patient for COVID-19 symptoms such as fever, cough, muscle pain, or history of contact or Table 4:5 point Likert scale scaring to evaluate den traveling to high-risk areas, Take COVID-19 test for all patients Reopening of dental clinics result in spreading of the virus Possibility of continuing the dental profession by persisting coronavirus-19, Patients had problems with paying basic feesLatest guidelines of dental settings during COVID-19 are useful PPE is effective to prevent virus transmission" a significant variance was seen.

Table 4: 5-point Likert-scale scoring to evaluate dentists' attitudes and views on the outbreak

reside the point interestence secting to evalu			outor tuni	
Question	The 5likert scale	Frequency	Percent	P Value
Phone call is effective to resolve	Completely	13	7.0	.000
patient's dental problems	agree			
	Agree	92	49.2	
	Somewhat	15	8.0	

	Agree			
	Disagree	29	15.5	
	Completely	38	20.3	
	Disagree			
	Total	187	100.0	
Examine the patient for COVID-19	Completely	74	39.6	.000
Symptoms such as fever, cough, muscle	agree			
pain, or history of contact or traveling to	Agree	27	14.4	
high-risk areas	Somewhat	2	1.1	
	Agree		24.2	
	Disagree	64	34.2	
	Completely Disagree	20	10.7	
	I otal	18/	100.0	000
Take COVID-19 test for all patients	Completely agree	35	18.7	.000
	Agree Somowhat Agree	10	57.4	
	Disagraa	10	25.7	
	Completely	48	12.8	
	Disagree	<i>2</i> 7	12.0	
	Total	187	100.0	
<b>Reopening of dental clinics result in</b>	Completely	3	1.6	.000
Spreading of the virus	agree	C	110	1000
	Agree	48	25.7	
	Somewhat	25	13.4	
	Agree			
	Disagree	20	10.7	
	Completely	91	48.7	
	Disagree			
	Total	187	100.0	
Possibility of continuing the dental	Completely	55	29.4	.000
profession by persisting	agree			
coronavirus-19	Agree	42	22.5	
	Somewhat	4	2.1	
	Agree	00	42.0	
	Disagree Commission Disagree	82	43.9	
	Completely Disagree	4	2.1	
Detionts had problems with	Total Completely agree	20	100.0	000
rations had problems with paying basic fees		53	28.3	.000
paying basic iees	Somewhat Agree	10	53	
	Disagree	71	38.0	
	Completely	33	17.6	
	Disagree	55	17.0	
	Total	187	100.0	
Latest guidelines of dental	Completely	48	25.7	.000
settingsduringCOVID-19 are useful	agree			
	Agree	34	18.2	
	Somewhat	6	3.2	
	Agree			
	Disagree	94	50.3	
	Completely Disagree	5	2.7	
	Total	187	100.0	
PPE is effective to prevent virus	Completely agree	34	18.2	.000
transmission	Agree	69	36.9	
	Somewhat Agree	5	2.7	
	Disagree	69	36.9	
	Completely Disagree	10	5.3	
	Totol	107	1 100 0	

### DISCUSSION

According to the findings of our study, around 33% of dentists reported COVID-19 symptoms, and nearly 16% of them had a positive COVID-19 test. Additionally, because 23% of the contributors' assistants exhibited the aforementioned symptoms, our analysis revealed that dental clinic employees are at a high risk of contracting the illness. According to this, dental procedures should be performed even with increased infection control precautions, and non-emergency treatments should be postponed until the epidemic is over [19].

Dental professionals have been concerned about the nosocomial transmission of SARS-CoV-2 since it could put both patients and dentists at risk of infection [20]. Dental professionals are more likely to contract SARS-CoV-2 infection than other healthcare professionals, according to earlier studies [21-23]. The vast majority of the study's participants indicated a sharp rise in demand for online dental consultations. However, 46% of respondents did not think that providing dental services via remote consultation was an efficient method. The peculiarities of dental operations and a lack of adequate infrastructure may be to blame for these outcomes. Future research is necessary to formulate theories and create cuttingedge technology that can virtually give dental services [24].

For non-emergent cases during the pandemic, the Occupational Safety and Health Administration has stated that employing remote dental consultations should be taken into consideration [25]. Additionally, remote consultation was determined to be of appropriate quality for oral therapies prior to the present pandemic [26]. In these unheard-of times, the telehealth-based provision of dental treatments appears to be an appealing and adaptable idea [27]. Despite this, the majority of clinics lack the tools necessary to offer telehealth services, such as network infrastructures and suitably trained employees [23].

In order to reduce the transmission of the virus, a sizable portion of the participants said that they do not do any non-emergency procedures and that they have shortened their workdays. They also affirmed that they adhere to and put into effect the most recent COVID-19 standards for dental practice at the national and international levels. However, more than half of them said that the local government needed to change the standards in that area. To effectively reduce the risk of infection, in our opinion, dental settings need to receive thorough education from all around the world.

The American Dental Association (ADA), British Dental Association, National Health Service, and other organizations have created reaction groups and guidelines for dental settings in response to the current epidemic [10, 28, 29]. These guidelines placed a strong emphasis on thoroughly inspecting patients while taking their clinical symptoms and epidemiological background into account [23]. The

guidelines also advised performing dental care treatments for urgent and emergency diagnosis while providing the necessary PPE and patient care materials [4] in the early stages of the pandemic.

Reduced treatment sessions, a focus on preventative care, patient triage for associated symptoms, COVID-19 testing for referred patients, and correct PPE usage are just a few of the recommendations provided in our study to lower the risk of infection. Some attendees thought that reopening dental clinics for nonemergency situations may increase the frequency of COVID-19 and that the offices should remain closed until the epidemic was over.

Public groups advised people to practice preventative care and improve their oral hygiene in order to lessen the need for dental operations during the epidemic [23]. Given that the majority of dental clinics only perform low-risk operations like tooth extraction, the demand for detachable prosthetic treatments may rise in the future [30]. Though it has been suggested that dental settings can also provide non-emergency treatments as the pandemic persisted. Elective care services are now offered at more than 90% of dental clinics, according to a survey conducted by the ADA Health Policy Institute [31]. To reduce the danger of spreading disease, the CDC has also created a guideline for health care systems and healthcare professionals to follow [32].

To effectively stop the spread of the virus to and from patients and healthcare professionals, PPE, such as gowns, gloves, face shields, goggles, and face masks, must be used [33, 34]. While the worldwide shortage of PPE supply was caused by the rapid increase in demand [35]. Since the COVID-19 epidemic, the majority of the study's participants claim that PPE consumption has increased dramatically, and more than half of them report having problems finding face masks. Additionally, they stated that the cost of PPE had drastically increased, which would indicate a shortage. Costs for dental care may also grow as a result of the rising price of PPE [23]. Nevertheless, public groups did not assist the participants in getting this gear.

Because of their shortened workweeks and constrained access to dental care, a sizable portion of the participants had financial difficulties. According to a study, the COVID-19 outbreak caused dental offices to experience financial hardship [36]. More than half of the dentists in Pune have been using their savings to cover daily expenses. However, a small percentage of them have benefited financially from government agencies. These findings suggest that in order to support dentists and their assistants during these historic times, relevant organizations must step up their efforts. The number of workers who experience financial difficulties will rise if the COVID-19 pandemic is allowed to continue and support funding for dental care workers are not provided [23].

Additionally, our study revealed that roughly half of

the subjects reported signs of anxiety and despair. It has been noticed that during the COVID-19 epidemic, health-care personnel are experiencing significantly more emotional stress than the general population [37, 38]. The biggest concerns among the medical personnel during pandemics are reported to be increased workload, working with frequently changing procedures, employing PPE, socialdistancing, self-isolation, and caring for patients who are deteriorating [39, 40]. Additionally, because there are limited resources during pandemics, employees must make difficult decisions. The dentists who took part in the study indicated that they should speak with a therapist or a psychiatrist.

Our research has some drawbacks. The sampling strategy used in our study is one of its most significant flaws. Chain-referral sampling is a simple and efficient way to identify participants, although after being invited, some persons may decline to take part in the study. Participants may also suggest a dentist they know who treats patients in a similar age group. As a descriptive study, our investigation was unable to test or confirm the causal relationship because it concentrated on describing the environment and the objects. Our study's time constraint, which prevented us from conducting the questionnaires in a timely manner, is another flaw.

### CONCLUSION

The majority of the dentists in the current study adhered to the most recent COVID-19 recommendations. Additionally, many decided to reduce their work schedules and save dental procedures for emergencies only until the pandemic was over. The full reopening of the dentistry clinics was also thought to raise the risk of COVID-19 transmission. The shutdown of dental clinics also caused financial difficulties for the practitioners. Additionally, anxiety and melancholy were prevalent complaints among dentists at the time. In these unique times, public groups must step in to support dentists both financially and psychologically. To identify answers for the current and upcoming pandemics, researchers must also make reasonable efforts to assess the effects of COVID-19 on dental practice.

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