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COVID 19 Pandemic in Dental Practice: Challenges and Infection Control Measures with Reference to Maharashtra State



Priyanka G. Awasare*¹, Rajesh Gaikwad², Chitra Patil³, Namrata desale⁴

¹Post graduate student Department of Periodontology, Government dental College & Hospital, Mumbai, India.

²Professor & HOD- Department of Periodontology, Government dental College & Hospital, Mumbai, India.

³Assistant professor, Government dental College & Hospital, Mumbai, India. ⁴Post graduate student, Government dental College & Hospital, Mumbai, India.

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ABSTRACT

The emergence of the highly infectious and novel Coronavirus named SARS-CoV-2, is growing exponentially in the whole world. All healthcare professionals, including dental healthcare providers are at a higher risk of coming into close contact with COVID-19 patients than the general public. This study aims to identify the different challenges face by doctors in dental college and hospital in Maharashtra state and develop strategies for infection control. A questionnaire was created on Google forms and circulated to participants using various social media platforms. The data of responses of participants were analyzed and evaluated. There are various challenges for infection control during this COVID 19 outbreak in dentistry because dentists are reported to have a higher risk of transmission in this situation. Questionnaire based survey helped in assessing the common concerns among the students of dental college of Maharashtra associated with COVID-19.

INTRODUCTION

The novel Coronavirus known as SARS-CoV-2 (also called 2019-nCoV) is the seventh coronavirus discovered in the world which affects human beings, causing the disease known as COVID-19 (Coronavirus disease – 2019 [1-2]. To the extent that the number of COVID-19 cases increase, the world's health, economy and social stability has been disrupted. Until May 21, 2020, approximately 213 countries and territories had been affected by SARS-CoV-2. The United States of America (USA) (1,604,109 cases), Russia (317,554 cases), Brazil (296,033 cases), Spain (280,117 cases), United Kingdom (250,908 cases), Italy (228,006 cases), France (181,575 cases), and Germany (178,864 cases) are on the top of the list of the most afflicted countries. The outbreak of corona virus disease 2019 (COVID-19) in the area of Wuhan, China, has evolved rapidly into a public health crisis and has spread exponentially to other parts of the world. The novel Coronavirus belongs to a family of single-stranded RNA viruses known as coronaviridae[3-4]. This family of viruses are known to be zoonotic or transmitted from animals to humans. These include severe acute respiratory syndrome coronavirus (SARS-CoV), first identified in 2002, and the Middle East respiratory syndrome coronavirus (MERS-CoV), first identified in 2012. There is strong evidence that this novel coronavirus has similarity to Coronavirus species found in bats and potentially pangolins, confirming the zoonotic nature of this new cross-species viral-mediated disease [5, 6, 7].

Coronavirus disease 2019 also called COVID-19, although originated in China, within 3 months it spread to many countries becoming a WHO declared pandemic. It has caused worldwide major disruption in public health and in social aspects, as well as in the economy. It is an infectious respiratory disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Airborne transmission of the virus is the primary mode of transmission. Through sneezing, coughing and breathing, both symptomatic and asymptomatic patients can transmit this virus by contaminating the air around them. Uncovered cough can expel droplets up to 4 m [8]. Droplets and aerosols created by these infected individuals are inhaled by uninfected individuals. Experimental research has shown that SARS-CoV-2 can survive in aerosols [9-10].

Dentistry is facing its darkest hour yet, with the growth and spread of the coronavirus pandemic. Dental surgeons are at the highest risk of contracting and transmitting the coronavirus, alongside paramedics, nurses, and other healthcare workers. Practicing is a challenge as most of the

practices including dental colleges and teaching institutions are not compatible with government norms and regulations on COVID-19.^[11] In clinical practice, dental professionals are exposed to a large risk of infection by SARS-CoV-2, due to communication and contact with various patients every day.[12,13]. Saliva is an important source of transmission due to aerosols created through natural activities such as breathing, sneezing and coughing, posing potential danger to healthy uninfected individuals as well as healthcare workers in medical facilities. However, dental personnel who work in close proximity to the oral cavity are at a greater risk due to the extensive aerosols created during dental treatment particularly during the use of high speed drills, ultrasonic scalars and air/water syringes. SARS-CoV-2 virus has been detected in saliva samples of 87–100% of clinical patients [14, 15, 16].

MATERIAL AND METHODOLOGY

Subjects and questionnaires

Data collection was done with the help of well-structured questionnaire. We assessed the infection control measures in post graduate students and dental staff in dental colleges and hospital with reference to Maharashtra state on the current infection control measures for COVID-19, we conducted a cross-sectional self-administered web-based survey study to gain a rapid insight into the preparedness of healthcare facilities and investigate current state practices and perceptions among professionals concerning the prevention and control of COVID-19.

One hundred and sixty two respondents which include dental teaching staff, post graduate students in government and private dental colleges in Maharashtra state filled in a questionnaire which was sent to them. The questionnaire was administered via google form and distributed to all dental colleges in Maharashtra through online social platforms like emails, facebook, and other communication tools. Validation using Cronbach's alpha has been performed for overall all questions with 20 homogeneous respondents males and females & also for each of the 24 questions.

The questionnaire included a range of thirty questions on their knowledge and application of, and attitudes to, infection prevention and control measures in their institutions. For aid of interpretation, frequency table are given below [table1].

Statistical procedures

- Data obtained was compiled on a MS Office Excel Sheet (v 2019, Microsoft Redmond Campus, Redmond, Washington, United States).
- Data was subjected to statistical analysis using Statistical package for social sciences (SPSS v 26.0, IBM).

RESULT

The results of this questionnaire based survey highlighted certain key features, analyzed the major concerns of dental surgeons and tried to evaluate in the dental college and hospital assessed the infection control measures with reference Maharashtra are more highly concern about the infection control during pandemic. A total of 162 postgraduate students and dental teaching staff from different colleges in Maharashtra participated in the study; amongst which there were 30(17.2%) from conservative dentistry department,14(8%) from dept of oral and maxillofacial surgery,13(7.5%) from dept of oral medicine and maxillofacial radiology. 8(4.6%) from dept of oral pathology and microbiology.24(13.4%) from the dept of orthodontics,12(6.4%) from dept of pedodontics & Preventive Dentistry,52(29.9%) from the dept of periodontology,16(9.2%) from the dept of prosthodontics, and 5(2.9%) from the dept of public health dentistry were involved and in total 162 participants were involved in this study. Respondents distribution as per designation consist 4.6 (8) percent are assistant professor, 94.8 (165) percent are MDS students and 0.6 percent (1) percent are professor. Majority of respondents of this study are MDS Students from different dental institutes in Maharashtra state. 64.4 (112) percent of respondents of the study were female and 35.6(62) percent of respondents are Male. Here in this study majority of respondents are females. Most of the respondents i.e. 95.4 (166) percent are from the age group 20-30 years, 4 percent of respondents from the age group 30-40 years and only 1 respondents was above age group 40-50 years. Distribution as per what type of display visual alerts are there at entrance of the facility and in strategic areas shows 20.1 (35) percent of respondents said they have social distancing display at their entrance it is followed by the 19 (33) percent of respondents who said cough equates and social distancing displays are there at their entrance, 12.6 (22) percent of respondents said they have all the displays listed in questionnaire at the entrance of their institutes. 70 percent of respondent said

they don't have cashless facility in their hospitals and only 30 percent of hospitals are having this cashless facility at their hospitals. Here it is found that in 96 percent dental professionals' said proper fumigation take place in the dental office. Ninety two percent of departments have ventilation and air quality management in stand-alone dental clinics. Ninety four percent of respondents provide PPE kit to their doctors, 93.7 percent of department have separate room for donning and doffing, 90.2 percent of dentist percent said they perform Covid-19 screening of all patient before treatment, 97.1 percent of dentist takes consent letter and declaration from patient. In distribution as per radio graph do you prefer 63.2 percent of dentist said their department have extra oral imaging, 24.7 percent of dentist said their department have intra oral imaging and 10.3 percent of dentist said their dept have intra oral imaging with double barrier. Only 26.4 percent of dentist said they treat suspected cases of COVID 19 where 73.6 percent of dentist said they don't treat suspected cases of covid19. Majority of respondent doctors said they treat suspected cases in Negative Pressure Room i.e. 66.7 percent of respondents, 50 percent of doctors said they encourage Tele -consult Tele-screening at your department still 50 percent of doctors said they don't.

DISCUSSION

Aim of this study to identify the challenges for doctors in dental college and hospital in Maharashtra, and to develop the infection control strategies in the outbreak of COVID-19, including dental teaching staff and postgraduate students from government dental colleges, private colleges. Responses to a series of questions on infection prevention and control were assessed from the perspectives of professions from different government and private dental institution in Maharashtra state. COVID-19 has had a devastating impact on the dental industry, and with the pandemic still on the growth curve, and it is difficult to ascertain the extent and severity of its long-term impact at this point of time.

Zi-yu GE, Lu-ming YANG, in his article possible aerosol transmission of COVID-19 and special precautions in dentistry concluded that Dental professional by nature, of their clinical practice are at high risk of exposure to infectious diseases. This situation on corona virus has brought new challenges and responsibilities to dental professionals. Awareness and good knowledge of aerosol transmission and its implication in dentistry may aid us it finds and correct negligence in routine dental practice. The output or result of questionnaire based survey study marked certain

features, and analyzed the main concerns of dental surgeons and tried to evaluate the different areas of anxiety. Most of the respondents believed that dentists were at higher risk of contracting the virus than any other health care professionals [17]. The respondent of this survey is highly concern about the infection control measure.

Christian Diegritz & Jürgen Manhart conducted a study on “a detailed report on the measures taken in the department of conservative dentistry and periodontology in Munich at the beginning of the COVID-19 outbreak” In their study it was observed that significance of hygiene and treatment standards as well as ample supply of PPE kit for dental office and hospitals, institutes are highlighted. the control measures reported may be subject to vary because of the dynamic measure of virus and situation of pandemic modes of transmission of covid 19 virus can constitute higher risk for dental healthcare personnel’s and patient as well. The given control measure can guide dental faculties and dental practices during the beginning stage of the corona virus crises. Assessing the common concerns among the dental surgeons of various dental colleges in Maharashtra associated with COVID-19.

CONCLUSION

The health care professionals must understand the implications of potential transmission of the virus in clinical practice, as the information on this pandemic is continuously changing it is vital that dental health care personnel stay updated on the emerging research to be continue providing dental treatment in a safe environment. Resuming regular clinical practice dental colleges and hospital is likely to be a series of challenges from an administrative perspective, procurement of specific equipment, to establish appropriate work force schedule, contact tracing, facility engineering and so on. The first thing we need to understand as a challenge this corona virus does not spread only through the active patient it can spread even through a asymptomatic person who came for dental treatment and to face this challenge next challenges is whether our dental professionals are fully equipped with the adequate safeguard and other facility at their institution to deal with patient. It is also a challenge for all dental professionals to get acquainted with the latest development in nature of infection of this virus and preventive measures and recommendation provided by the concerned controlling and governing authorities. Questionnaire based survey clearly helped in assessing the common concerns among the students of dental college of Maharashtra associated with COVID-19. That performs dental care or clinical practice

procedure in airborne infection isolation room including hand hygiene practice. It is recommended that frequently disinfect surface with surface disinfectant liquid and maintain dry environment. Modified structural telephonic and online triaging should be employed as a method to reduce the risk of disease transmission. Resuming regular dental clinical activities at dental hospital and colleges after COVID 19 is likely to be a big challenge for all dental institutes.

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Frequency Table

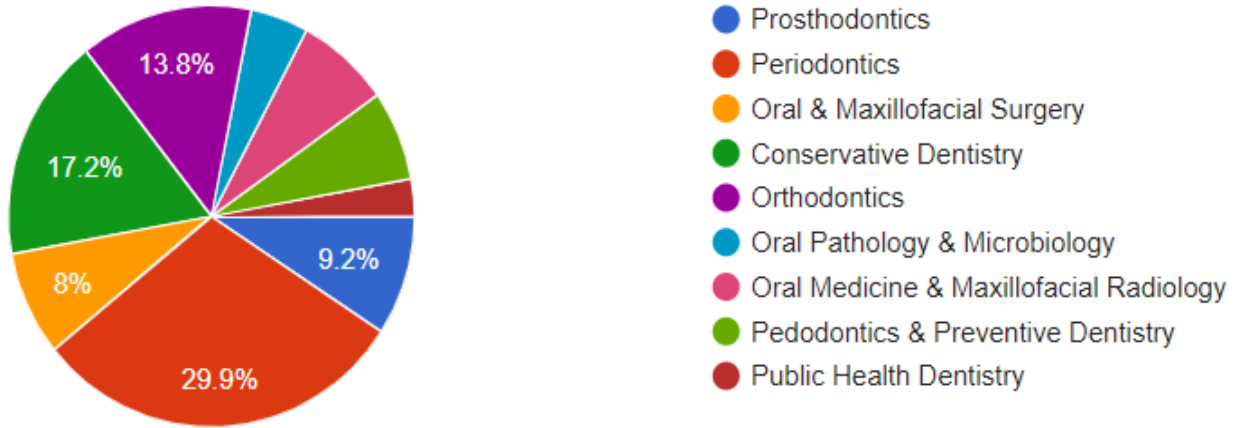
Table 1: demographic details of the respondents

Question	Responses	Frequency	Percent
Do you have spittoon outside the reception area?	No	109	62.6
	Yes	65	37.4
Have you installed glass or plastic barrier at the reception desk, preferably with a two-way speaker?	No	122	70.1
	Yes	52	29.9
Does your department have cashless /contact less payment methods?	No	127	73.0
	Yes	47	27.0
Does proper fumigation take place in the dental office?	No	7	4.0
	Yes	167	96.0
Does your department have ventilation and air quality management in stand-alone dental clinics?	No	13	7.5
	Yes	161	92.5
Does your department provide PPE kit?	No	10	5.7
	Yes	164	94.3
Does your department have separate room for donning and doffing?	No	11	6.3
	Yes	163	93.7
Do you wear triple gloves and N95 mask during procedure?	No	5	2.9
	Yes	169	97.1
Do you do hand hygiene with sanitizer?	Yes	174	100.0
Do you do Covid-19 screening of all patients before treatment?	No	16	9.2
	Yes	158	90.8
Do you give face mask to patients who are	No	77	44.3

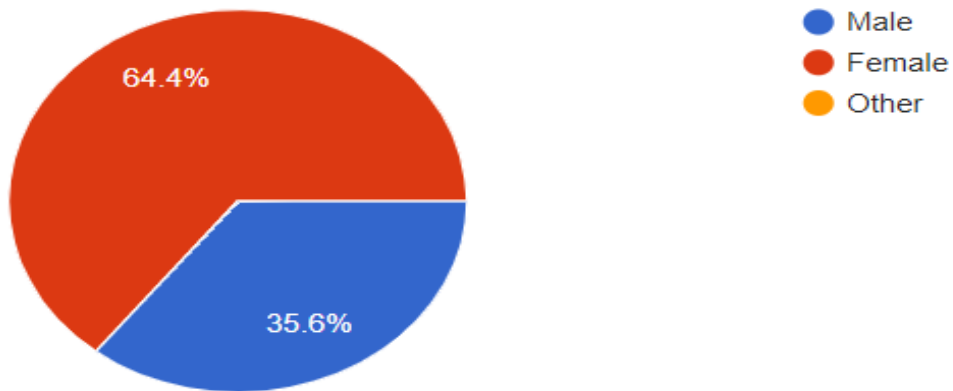
in waiting?	Yes	97	55.7
Do you obtain Patient consent and declaration?	No	5	2.9
	Yes	169	97.1
Do you ask the patient their medical or travel history before treatment?	No	1	.6
	Yes	173	99.4
Do you give pre-procedural mouth rinse to patient?	No	7	4.0
	Yes	167	96.0
Do you use the rubber dam?	No	140	80.5
	Yes	34	19.5
Do you treat suspected cases of covid 19?	No	128	73.6
	Yes	46	26.4
Does your department use autoclave method to sterilize instruments?	Yes	174	100.0
Do you take bio-waste measures at your department?	No	5	2.9
	Yes	169	97.1
Do you encourage Tele -consult Tele-screening at your department?	No	87	50.0
	Yes	87	50.0
Do you encourage all to download the Aarogya Setu App?	No	9	5.2
	Yes	165	94.8

Demographic characteristics of the study population

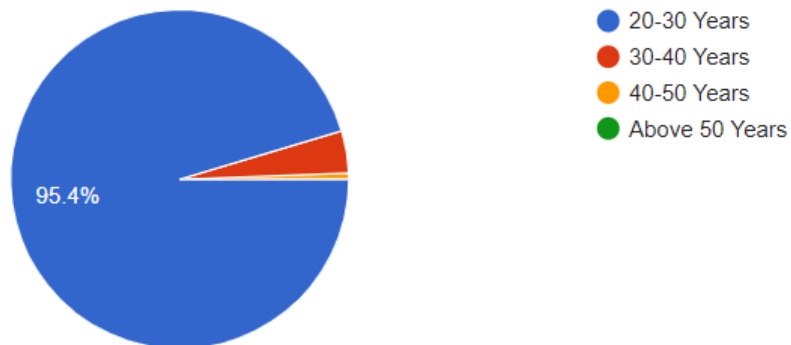
Department



Gender



Age



<p><i>Image</i></p> <p><i>Author -1</i></p>	<p><i>Author Name – Priyanka Awasare [Corresponding Author]</i></p> <p><i>Post graduate student</i></p> <p><i>Government Dental college and hospital Mumbai.</i></p>
<p><i>Image</i></p> <p><i>Author -2</i></p>	<p><i>Author Name- Rajesh Gaikwad</i></p> <p><i>Professor</i></p> <p><i>Government Dental college and hospital Mumbai.</i></p>
<p><i>Image</i></p> <p><i>Author -3</i></p>	<p><i>Author Name-Chitra Patil</i></p> <p><i>Assistant Professor</i></p> <p><i>Government Dental college and hospital Mumbai.</i></p>
<p><i>Image</i></p> <p><i>Author -4</i></p>	<p><i>Author Name- Namrata Desale</i></p> <p><i>Post graduate student</i></p> <p><i>Government Dental college and hospital Mumbai.</i></p>