



## RESEARCH ARTICLE

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**Effect of COVID-19 Pandemic on Dental Surgeons in Jhanshi and Datia 2 nearby District****Laxman Singh Kaira<sup>1</sup>, Atul pratap singh kushwah<sup>2\*</sup> and K S Negi<sup>3</sup>**<sup>1</sup>Associate professor and head, Department of Dentistry, Government Medical college, Datia, Madhyapradesh<sup>2</sup>Assistant professor, Dept of Dentistry, Gvt med college datia, Madhyapradesh<sup>3</sup>Mds Endodontist, Joint Director (Dental Cadre), Provincial Medical Health Scheme, Uttrakhand gvt**ABSTRACT**

A new coronavirus (Sars-CoV-2) was detected in China at the end of 2019 and has since caused a worldwide pandemic. The Sars-CoV-2 is highly infective through airborne contamination, the high infection risk in the dental environment is a serious problem for both professional practitioners and patients. Present study was done to evaluate the impact of Corona Virus disease 2019 (COVID-19) pandemic on dental practice by conducting an online questionnaire among the dental practitioners of 2 nearby districts of Jhanshi and Datia.

**Methods:** A Questionnaire based study was done among the dentists of 2 nearby districts. The study included questions that evaluate the dentists' knowledge, perceptions and attitudes toward the COVID-19 pandemic and its effect on their personal life, financial status, and the quality of dental services for patients.

**Results:** A total of 178 dentists contributed to this study (134 general dentist and 44 Specialist). The majority of the participants (n = 146, 82 %) did not perform any non-emergency procedures during the pandemic. The general dental practitioners have employed standard treatment protocols and SOPS( Standard Operating Protocols) to decrease the risk of transmission, like scheduling minimum treatment durations (n = 76, 48%), proper diagnosis and check up of patients (n = 118, 66%), and using recent personal protective equipment (n = 83, 47%). However, most of the dentists (n=164 , 92%) had financial and availability problems of personal protective equipment during the pandemic. Most, 95% (n = 170) of the participants reported that they encountered a decrease in their financial income since the eruption of the pandemic.

**Conclusion:** The practice of dentistry involves the use of rotary dental and surgical instruments, such as air-rotors or ultrasonic scalers and air-water syringes. These instruments create a visible spray that can contain particle droplets of water, saliva, blood, microorganisms, and other debris. Surgical masks protect mucous membranes of the mouth and nose from droplet spatter, but they do not provide complete protection against inhalation of infectious agents. Thus, dental practitioners need to execute the standard operating protocols (SOPS) more cautiously during the pandemic.

This includes reducing the treatment hours and limiting dental procedures to only emergency treatments to reduce the risk of COVID-19 transmission.

**Introduction**

At the end of 2019, the first cases of pulmonary disease of unknown origin were detected in Hubei province of Wuhan City of China. In few months, this new pathogen spread throughout Europe and then worldwide. In the month of March 2020, the World Health Organization (WHO) officially declared a pandemic alert about this novel virus. This new virus, highly infective especially through air-borne transmission, is responsible for an acute respiratory syndrome, distinguished by an often asymptomatic, but potentially lethal, interstitial bilateral pneumonia [1].

This virus, initially named 2019-n CoV and subsequently renamed Sars-CoV-2, belongs to the Coronaviridae family, along with the Middle East respiratory syndrome (MERS-CoV) and the severe acute respiratory syndrome (SARS-CoV) viruses [2]. The most advanced sero and genome studies performed on infected Chinese patients revealed that this pandemic originated from a zoonosis, after a single transmission event between an animal and a human, followed by subsequent, rapid inter-human diffusion. The main infection pathways of Sars-CoV-2 are air and direct contact [1].

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Airborne infection occurs through droplets released by coughing, sneezing, exhalation or speech; direct-contact infection occurs through contact with contaminated surfaces and subsequent touching of the eyes, nose or mouth [1,3]. Saliva also plays a crucial role in the spread of infection, through both airborne and direct-contact pathways. The use of high speed airtors and ultrasonic scalers during dental procedures results in the generation of blood and saliva droplets [2]. These droplets not only contaminate the dental instruments and the dental clinics but also the dentist, dental assistant and the patients are at risk of being infected with microbial pathogens [4].

American Dental Association (ADA) ensures standard operating protocols that's includes limiting treatment time, use of personal protective equipments, avoiding non emergency treatment, triaging of the patients. Regular sterilization of operating area and disinfecting the dental instruments and encouraging patients to use mouthwash before appointments etc [5]. Dentists were advised to use high volume saliva ejectors and anti-retraction airrotors to reduce the aerosol production, and use the rubber dam isolation and personal protective equipment (PPE) [5]. Moreover, medical waste of suspected or confirmed SARS-CoV2 patients should be stored in double-layer yellow medical waste package bags, "gooseneck" ligation, and transported to the temporary storage area. The Irish Dental Association clarified that about 75% of dental practitioners are expecting a financial loss of over 70% during the outbreak [6]. Furthermore, it has been mentioned that dental practitioners could be infected with the SARS-CoV-2 virus, unnoticeably, and become carriers of the virus [3]. In the present study, we aimed to evaluate the impact of corona-virus disease 2019 (COVID-19) pandemic on dental practice by conducting an online questionnaire among dental practitioners and knowing there knowledge ,attitude and perceptions on the subject.

### Methods

This study is based on a questionnaire distributed among dentists from 1st march to may 1st, 2021, among the dentists of two nearby districts of India. Our study population consists of 178 dentists who work in Jhanshi and Datia cities. The dentists were asked to participate in the study by first messaging them on their contact number and than the questionnaire was distributed among them via e-mail. 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 detailed 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 (5 leading dentists ) and guidance from relevant literature. The validity of the questionnaire was evaluated by the experts and statistician. The questionnaire includes questions and is written in both English and Hindi. The first section included primary demographic data. The second

part consisted of closed questions (yes/no questions) about the dentists' opinion on the COVID-19 pandemic and its effect on their personal life, financial status, and the quality of dental services for patients. The third section consists of multiple-choice questions about the dentists' perspectives on the pandemic. The last part of the survey is based on the 5-point Likert-scale scoring to evaluate dentists' attitudes and views on the outbreak.

### Data Collection and Analysis

A trained statistician who was unaware of the names and degrees of the participants has gathered the results. Microsoft Excel sheets have been used to create tables and graphs. The first and second researchers minutely reviewed the extracted data for accuracy. Descriptive statistical analysis was used to described the investigated data.

### Results

Overall, 178 dentists were contributed to this study (134 general dentists and 44 specialists). More than half of the participants (n = 95, 53.3%) were between 36 to 45 years with a job experience of more than ten years. Among all the participants,154 (87%) were male, 24 (13%) were female, 140 (79%) were married, and 38 (21%) were single (Table 1).

**Table 1: Subjects information Number Percentage**

Age groups (years)	25-35	35	19.6
	36-45	95	53.3
	46-55	25	14
	56-65	23	13
Years of practice	Upto 10 years	58	32
	10-20	85	48
	20-30	23	13
	More than 30	12	7
Gender	Male	154	87
	Female	24	13
Marital status	Single	38	21
	Married	140	79
Specialization	Prosthodontics	5	11
	Periodontics	4	9
	Oral surgeons	8	18
	Pedodontics	7	16
	Orthodontics	8	18
	Endodontist	12	27
	General dentist	134	100
Health sector	Government set up	35	20
	Private hospital	143	80

A total of 105(58%) have seen an increased in telephonic calls from patients for their dental problems. Only 12 (6%) of the dentists have come across high risk patients. 16 (9%) of the participants have observed the symptoms the COVID-19 in themselves, and 10 dentist had the disease; besides, 25 (14%) of the participants reported that their assistants had the symptoms (Table 2).

**Table 2: Dentists experience regarding the covid 19**

Have you experienced the following Since the pandemic	Yes Number	Percentage	No Number	Percentage	Not applicable Number	Percentage
A Rise in telephonic calls from patients	105	58	65	36	8	4
High risk patients visiting in clinics	12	7	166	93	0	0
Doctors Had symptoms of covid 19	16	9	162	91	0	0
Doctors Had a positive Rtpcr report	10	6	168	94	0	0
Your attendents had symptoms	25	14	153	86	0	0
Your attendents had positive rtpcr report	15	8	163	92	0	0

Nearly all the participating dentists ie 163 (93%) believe that dental consultation via telephonic conversation could not solve the patients problems.86% of the dentists believe that the triage of the patients should be done regarding the covid 19 symptoms like history of fever, cough, muscle pain ,loss of taste, history of contact n traveling history to any high risk area. Nearly 130 (72%) of the subjects agreed that the Covid -19 test must be done for the patients before doing any patients. A total of 130 (72%) dentists believe that reopening of dental clinic may results in increase in cases of COVID- 19 so that dental clinics should be closed. (Table 3).

**Table 3: Dentists perceptions about the covid 19**

Did you agree or disagree with the following statement	Completely agree Number	percentage	Agree number	percentage	Disagree number	percentage
Only phone call can solve dental problems	3	1	12	6	163	93
Examine covid 19 patients with symptoms	110	61	46	25	22	14
Take rtpcr test for pt	88	49	42	23	48	28
Reopening dental clinics results in virus spreading	72	40	58	32	50	28
Possibility of continuing dental practice with covid 19	12	6	45	25	121	69
Pts had problem in paying fees n charges for procedures	88	49	46	26	44	25
Follows the latest news of covid 19	110	62	52	29	16	9
Latest news of covid 19 are useful	36	20	68	38	74	42
Latest sops of dental procedures are going to change in future	45	25	116	65	18	10
Ppe is compulsory to prevent transmission	68	38	92	51	20	11
A decrease in financial income by continuing the pandemic in future	10	57	58	32	20	11

Among the participating dentists, 94 (58%) have believed that the latest guidelines of COVID-19 pandemic are useful. A total of 161(90%) believed that the dental practices protocols are going to change in future (Table 3).

Majority of the contributors (N=154, 87%) did not perform any non-emergency procedures during the pandemic and 152 (87%) of the dentists had changed there working hours. Among the participating dentists a total of 110 (61%) dentists had reduced the treatment sessions, and 42 participants (23%) said that they emphasize on preventive care in the pandemic (Table 4).

**Table 4: Dentist proposed concept of dental practice in pandemic**

Have you seen the followings things in pandemic Yes ( number) percentage No(number) ( percentage)				
Performed non emergency procedures				
Bcos of patient request	24	13	154	87
Bcos of financial problems	52	29	126	72
Change your working pattern and schedule	152	85	26	15
Changed the procedures protocols				
Focus on preventive dentistry	42	23	58	32
Did not do un-required treatment	92	51	64	36
Reducing procedure timings	110	61	56	31
Reviewed the latest sops	165	93	13	7

42 % (N=75) of the contributors reported that they had cancelled their dental procedures till the end of pandemic. Nearly half of the participants 78(43%) believed that dental offices should be closed till the end of pandemic. Moreover 74 (41%) participants believed that proper use of PPE could reduced the risk of cross-infection (Table 5).

**Table 5: dentist attitude regarding dental practice in pandemic**

		Number of dentist	Percentage
You changed your treatment plans in covid 19	1-Did not changed	3	2
	2. Cancelled all appointments until the end of covid 19	75	42
	3.Perform emergency treatments	100	56
What procedures u did during pandemic	1.Did not do any non emergency treatment	102	57
	2. Aesthetic treatment	8	4
	3. Restorations of asymptomatic carious teeth	6	3
	4. Extraction of asymptomatic teeth	8	4
	5. Initial check up	35	20
What is your plans regarding opening of clinics	1.As soon as the end of pandemic	78	43
	2. End of alert phase	70	39
	3. Should open now	30	17
How u do your patients after clinic reopening	1. Not do any patients	66	37
	2.Pts with no symptoms	20	11
	3.Do covid 19 test	18	10
	4.Use PPE	74	41
How will you utilise more free time in pandemic	1.Stay home	32	17
	2.Do research	14	8
	3.Communicate with other dentist	46	26
	4.Study	62	35
	5.Exercise	24	13
Which of following u find it difficult to get in pandemic	1.No problem in getting PPE	8	4
	2.Sanitiser n disinfectants solutions	24	13
	3.Face mask	121	68
	4.Surgical drape n gown	7	4
	5.Face shield	15	8
	6. Gloves	23	13

Availability of PPE was a major problem in this pandemic for most of the dentists (N=154,87%). Almost all of the dentist (N=170, 96%) reported that they have to buy PPE with a higher price. Nearly 98% (N=174) of the participants mentioned that they did not received any help from public organizations for providing PPE while the use of PPE is drastically increased in this pandemic (N=168, 94%) (Table 6).

All the contributors (N=178,100%) admitted that their financial income is decreased in the pandemic, while only 2% (N=4) received financial support from the public organizations. Nearly half of the participants (N=86,48%) Needed alternate source of income to meet their daily needs. In this regards they might face serious financial problems in future due to pandemic. A total of 58 participants paid their assistants during pandemic inspite of clinic closure (Table 6).

**Table 6: Have you undergo the following problems during pandemic**

1.Problems in getting PPE	Yes number 154	Percentage 87	No Number 24	Percentage 13
2.Rise in PPE cost	170	96	8	4
3.Received helps from publics for PPE	38	21	140	79
4.Increased in PPE consumptions in practice	168	94	10	6
5. Decrease in income from practice	178	100		
6.Received financial help from NGO	4	2	174	98
7.Used alternate source of income for daily expenses	86	48	92	52
8. encountered financial problems	112	62	66	38
9.your attentents not come to work	88	49	90	51
10. pay to attentents despite clinic closure	58	32	120	68

**Discussion**

The results of our study showed that about 9% of the participating dentists had experienced the symptoms of COVID-19, and nearly 6% of them had a positive COVID-19 test. Besides, the workers in dental clinics are also at considerable risk of contagion, as our investigation showed that 14% of the contributors’ assistants had the symptoms mentioned above. This indicates that dental practice should be done following latest safety protocols, and the non-emergency treatments should be delayed until the end of the pandemic [7].

The noso-comial transmission of SARS-CoV-2 has been a concern for dental practitioners, as it could put both patients and dentists at the risk of spread of COVID 19 [8]. As previous studies also mentioned that dental practitioners are at higher risk of being infected by SARS-CoV-2 [9-11].

The majority of the participants of the present study reported a tremendous increase in the demand for visiting villages for dental services. However, they did not consider visiting rural areas as an effective way of delivering dental services. This may be due to lack of infrastructure and proper connectivity .Need of hour is advanced research studies emphasizing on latest technologies and use of virtual dental service delivery [12].

Occupational Safety and Health Administration has mentioned that using remote dental consultations should be considered for the non-emergent cases during the pandemic [13]. Additionally, before the current pandemic, remote consultation was found to have sufficient quality for oral treatments [14]. The tele health-based delivery of dental services seems to be an attractive and flexible concept, especially during these pandemic times [15]. Despite this, most clinics are lacking the proper network

infrastructures and lack of adequately trained staff to provide telehealth services [11].

A significant number of the participants mentioned that they do not perform any non-emergency procedures, and they have cut short their treatment hours to minimize the spread of the virus. They also declared that they follow and implement the latest standard operating protocols (SOPS) for dental practice. However, more than half of them believed that the standards in that regard must be reformed by the local authorities.

We believe that comprehensive worldwide protocols and knowledge sharing must be provided for dental settings to minimize the risk of infection, effectively.

Premier organizations such as the Centers for Disease Control and Prevention (CDC), ADA, British Dental Association, and National Health Service have designed and developed response groups, and guidance for dental settings [16-18]. These oraganizations critically emphasize on triaging the patients considering the clinical symptoms and travelling history [11]. In the early days of the pandemic, the guidelines also recommended that dental care procedures should be done for urgent and emergency diagnosis while providing appropriate PPE and patient care supplies [19].

In the present study, several suggestions have been made to decrease the risk of infection such as reducing the treatment sessions, emphasis on preventive care, triaging the patients for the related symptoms, conducting COVID- 19 tests for the referred patients, and proper use of PPE (Personal Protective Equipments). Some of participants believed that the reopening of the dental clinics for non-emergency cases might increase COVID-19 incidence, and the offices should be closed until the

end of the pandemic.

General population are motivated to maintain good oral hygiene and use mask, follow the proper brushing techniques to reduce the need for dental procedures, during the pandemic [11]. As most of the dental clinics only provide low-risk procedures such as tooth extraction, which could increase the demand for removable prosthetic treatments in the future [20]. However, as the pandemic continued, it has been proposed that dental settings can deliver non-emergency treatments as well.

A survey led by the ADA Health Policy Institute demonstrated that over 90% of dental clinics are now open for elective care services [21]. CDC (Centre for Disease Control) has also designed a standard for health-care systems and health-care workers for the delivery of non-emergent services to minimize the risk of contagion [22].

Effective use of PPE, disposable patients and dentist gowns, gloves, face shields, goggles, and face masks, is an essential regulation for preventing the spread of the virus to and from healthcare providers and patients [23,24]. While the rapid enhance of demand for PPE resulted in the shortage of these supplies all around the world [25]. The majority of the participants of the present study have asserted that the consumption of PPE had been significantly increased, and more than half of them had trouble finding facemask since the COVID-19 outbreak. Furthermore, they reported that the price of PPE had been significantly raised due to shortage. This increasing price of PPE might also lead to the rise of dental treatment costs [11]. Although, public organizations did not help the participants to provide this equipment.

A significant number of the participants had financial problems caused by their lessened working hours and revealed that the COVID-19 pandemic imposed financial distress on dental clinics [26]. More than half of the dentists have been using their savings for daily needs. Still, a small number of them have received financial help from public organizations. These results indicate that the related organizations and government must increase their efforts to fund the dentists and their assistants during these pandemic times. Increased workload, working with repeatedly changing protocols, using PPE, social-distancing, self-isolation, and caring for deteriorating patients are found to be the main concerns among the medical staff during the pandemics [27,28].

Our study has some limitations. One of the most important weaknesses of our study is the sampling method. Although chain-referral sampling is an easy and quick method to find participants, people may refuse to participate in the study after the invitation. Furthermore, participants may recommend a dentist whom they know with a similar age range. Our investigation is a descriptive study that focuses on descriptive analysis of the situation and objects; therefore, it was unable to test or verify the causal relationship. Another weakness of our study is that we had a limited time frame to conduct the questionnaires to be more up to date.

### Conclusion

Most of the participating dentists have reviewed and followed the latest COVID-19 guidelines. The participating dentists not only limiting their working hours but also did mostly emergency treatments until the end of the pandemic. They strongly believed

that the full reopening of the dental clinics might lead to an increase in the COVID-19 transmission. Moreover, the dentists encountered financial problems because of the closure of dental clinics. We believe that the public organizations and government must intervene to financially and psychologically support the dentists during these unprecedented times. Researchers must also take reasonable steps to evaluate the impacts of COVID-19 on dental practice to find solutions that can be used during the current and future pandemics.

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### Ethics Approval and Consent to Participate

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. All authors have approved the paper and agree to its submission and publishing in this journal.

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