Original Article

Assessment of Level of Perceived Stress and Sources of Stress Among Dental Professionals Before and During the COVID -19 Outbreak

Supriya Mishra[1], Shweta Singh[2], Vaibhav Tiwari[1], Bhavuk Vanza[3], Neha Khare[4], Punit Bharadwaj[5]

[1]Department of Periodontics, Government Dental College and Hospital, Raipur, Chhattisgarh, [2]Department of Dentistry, Civil Hospital, Kurud, Dhamtari, Chhattisgarh, [3]Department of Oral and Maxillofacial Surgery, Government Dental College, Indore, Madhya Pradesh, [4]Department of Periodontics, RKDF Dental College and Research Centre, Bhopal, Madhya Pradesh, [5]Department of Pediatrics and Preventive Dentistry, Vananchal Dental College and Hospital, Garhwa, Jharkhand, India

Received : 28-07-20
Revised : 26-08-20
Accepted : 18-09-20
Published : 24-11-20

ABSTRACT

Context: The recent spread of SARS-CoV-2 pandemic has resulted in a number of mental health issues among healthcare workers and dentists are no exception to this due to their nature of work. Hence, the aim of this study was to evaluate the level of perceived stress (PS) among Chhattisgarh dentists and identify the sources of stress before and during the COVID-19 crisis. **Materials and Methods:** An online questionnaire-based survey was done to assess the level of PS using perceived stress scale (PSS) and sources of stress among dentists of Chhattisgarh state of India before the onset of COVID-19 in the state and immediately after the nationwide lockdown was announced owing to COVID-19 outbreak. Based on the type of work, the dental practitioners were categorized into three groups—dental practitioners (group A), dental academicians (group B), and dentists who are practitioners as well as academicians (group C). Frequency, percentages, and mean values were calculated and compared among different participant characteristics using Student's *t* test, paired *t* test, and one-way ANOVA. **Results:** During phase I, mean PSS for dentists was 18.61 ± 6.87 which increased to 20.72 ± 1.95 in phase II. Group C dentists recorded higher mean PSS during phase I, while group A dentists reported higher mean PSS during phase II. No family time due to long working hours (90%) was the major stressor among the three groups of dentists during phase I and concern about getting infected (83.3%) was identified as the most frequent stressor during phase II followed by stress over financial implications. **Conclusion:** Chhattisgarh dentists are reeling under psychological stress, which could be highly deteriorating to their mental health. Hence, concerned authorities should come forward and support the dentists by providing adequate guidelines, policies, and monetary support to them.

Keywords: *Dentists, COVID-19, pandemic, stress, stressors*

Introduction

In late December 2019, a novel viral pneumonia outbreak originated in Wuhan City, China,[1] which later came to be known as "coronavirus disease-2019 (COVID-19)."[2] As the epidemic spread rampantly to other parts of the world, becoming a major public health problem not only for China but also countries around the world, the World Health Organization (WHO) announced this outbreak a pandemic.[3] India reported its first confirmed COVID-19 case on January 30, 2020 and the cases thereby continued to rise.[4] The first case of COVID-19 in the Chhattisgarh state of India was confirmed on March 19, 2020.[5] As of writing this article, the nation continued to be under third phase of lockdown till May 17, 2020.

Access this article online

Quick Response Code:

Website: www.jispcd.org

DOI: 10.4103/jispcd.JISPCD_340_20

Address for correspondence: Dr. Supriya Mishra, Department of Periodontics, Government Dental College and Hospital, Raipur 492001, Chhattisgarh, India.
E-mail: dr.supriya4@gmail.com

How to cite this article: Mishra S, Singh S, Tiwari V, Vanza B, Khare N, Bharadwaj P. Assessment of level of perceived stress and sources of stress among dental professionals before and during the COVID-19 outbreak. J Int Soc Prevent Communit Dent 2020;10:794-802.

To mitigate the spread, nationwide lockdown was initiated from the early hours of March 25, 2020.[6] Due to the specificity of the procedure, which involves face-to-face communication with patients, proximity to the patient's oropharyngeal region, exposure to saliva, blood, and other body fluids, aerosol generation, and the handling of sharps, dental professionals invariably carry the risk of nosocomial spread of SARS-CoV-2 who can become potential carriers of the disease.[7,8] Hence, many health regulatory bodies globally as well as in India placed an advisory for their registered dentists to perform only emergency and urgent dental procedures and avoid all elective treatments like restoration and extraction of asymptomatic teeth, aesthetic dental procedures, orthodontic adjustments, and routine radiographs.[9] As a result, most of the dental practices, hospitals, and institutions pan-India have closed operations since then.

The SARS-CoV-2 pandemic has likely put health care-workers across the world at an increased risk of mental health issues.[10] The reasons range from excessive workload/work hours, fear of contagion, concerns for self/family well-being, heightened need for infection control procedures domestics and at dental operatory, inadequate personal protective equipment, over-enthusiastic media news, feeling inadequately supported, procedural errors, along with core issues of financial insecurity and potential loss of income.[11-13] Dentists being an integral part of the society are no exception to this. Even otherwise, dentistry has been identified as a stressful profession that generates more stress than any other line of work and work-related factors account for more than half of the dentist's overall stress.[14]

Although a lot of studies have documented about the work-related stress and stressors among dentists in usual circumstances, to the best of our knowledge no study has assessed the psychological stress perception and the reasons behind the stress among dental fraternity due to COVID-19 outbreak and its associated lockdown. Hence, this study being the first of its kind was done with the following aim and objective:

a. To assess and compare the level of PS among dentists of Chhattisgarh state before the onset of SARS-CoV-2 spread in the state (phase I) and in the month immediately following the nationwide lockdown owing to SARS-CoV-2 outbreak (Phase II).
b. To identify the various reasons of stress among dentists of Chhattisgarh state during the two phases.

Materials and Methods

A cross-sectional online questionnaire-based survey was conducted in two phases among dentists working in the state of Chhattisgarh, India. The first phase of survey (phase I) started from 10:00 am of March 20, 2020 to continue till 10 pm of March 25, 2020. The second phase (phase II) started from 10:00 am of April 25, 2020 to 10:00 pm of April 30, 2020. A list of dentists across the Chhattisgarh state was obtained from the State Dental Council's dentists' directory which comprised of 3825 dentists.

All the dentists whose contact number/e-mail id was available were contacted and a brief introduction and objectives of the study were given. If a dentist agreed to participate in the survey (which was considered as informed consent), a link to the survey was sent to him/her to fill up the questionnaire. To prevent duplication of response, limit to one response was activated in the settings of the Google forms and the participating dentist then needed to sign in through his/her Google account. Ethical clearance was obtained from the Institutional Ethical Committee of Government Dental College and Hospital, Raipur, Chhattisgarh. (GDCHR/ERB/2020/11).

Dentists working in various regions of the Chhattisgarh state and who participated and completely filled the questionnaire in both the phases of survey were included in this study. Considering that presence of any kind of systemic disease could have a negative impact on psychological well-being and can act as a confounder in the present study, such dentists were excluded from the study.

An online questionnaire designed in the English language using Google forms was used for the purpose of the study. The structured questionnaire comprised of three parts. The first part assessed the general information—age, gender, qualification, years of experience, type of work, and general health of the participating dentist (presence of one or more systemic diseases). Based on the type of work, the dental professionals were categorized into three groups—dental practitioners (group A), dental academicians (group B), and dentists who are practitioners as well as academicians (group C). The three groups were sub-classified as belonging to either private sector or government sector. The second part of the questionnaire assessed the level of perceived stress (PS) of dentists using perceived stress scale (PSS) given by Cohen *et al*.[15] The 10-item PSS measures global PS experienced across the past one month on a 5-point scale (0—*never*, 1—*almost never,* 2—*once in a while*, 3—*often*, 4—*very often*).[15] Total scores range from 0 to 40. The third part of the questionnaire was an open-ended question where the participant had to list out all the sources of stress that occurred very often or always during the two phases of survey.

An online pilot study was first done on 30 dentists to test the reliability and validity of the questionnaire. Cronbach's alpha was used to assess the internal consistency reliability of questionnaire and was found to be good (0.84). Mean content validity ratio was 0.80 which was based on the opinion of five subject experts.

Statistical analysis

All the data collected were entered into a personal computer and subjected to analysis using Statistical Package for Social Sciences (SPSS) version 17 (IBM Corporation, New York, New York). Descriptive analysis was obtained in the study. Participant demographics and sources of stress were calculated in frequency and percentage distribution. Mean PSS was calculated for each of the participating dentists. The data followed a normal distribution (Shapiro-Wilk). Intra-group and intergroup comparisons were done using Student's *t* test, paired *t* test, one-way ANOVA, and *post-hoc* Tukey HSD test. For all analyses, statistical significance was fixed at 0.05.

Results

Considering an estimated prevalence of moderate to severe levels of PS among HCWs to be 59% based on the study by Du *et al.*,[16] the sample size estimated using the formula $(Z\alpha)^2pq/d^2$ using an alpha error of 5% and an absolute precision (d) of 3% was 814. Considering the estimated response rate to be 25% (e-mail response rates may only approximately 25–30% based on the study done by Yun *et al.*),[17] the sample size with the other assumptions remaining constant, would be 835 and the number of invitees in order to achieve the required sample size would be 3340. Considering that certain number of questionnaires to have incomplete responses, it was decided to contact totality of dentists (3825). Of 3825 dentists across the state, 3389 dentists were approached for participating in the study as 436 dentists could not be contacted due to unavailability of/incorrect email id/contact number. A total of 1756 dentists agreed to participate in the study. Of 1756 participants, 306 dentists were excluded from the present study due to the presence of one or more systemic diseases and 197 dentists were excluded either due to drop-out (82, 4.66%) or incomplete filling of the questionnaire (115, 6.54%). Hence, a total of 1253 participants were included in the final study sample, which was well above the required sample size. About 55.62% ($n = 697$) of participants were less than 35 years of age, while 44.38% ($n = 556$) greater than 35 years of age, with a mean age of the responders being 33.28 ± 7.64 years. The study comprised slightly more number of females ($n = 646$, 51.55%) than males ($n = 607$, 48.45%). Most of the participants were Bachelors in Dental Surgery (BDS) ($n = 705$, 56.19%) and had a clinical experience of less than 10 years ($n = 663$, 52.91%). The mean year of clinical experience was 6.85 ± 3.47 years. 505(40.30%) dentists were dental practitioners, 348 (27.78%) dental academicians and 400 (31.92%) dentists worked as practitioners as well as academicians. The other details are presented in Table 1.

During phase I period, 62.5% of dentists were stressed (moderate level of PS—596 (47.56%), high level of PS—188 (15.3%)) while in phase II, 79.24% of dentists were found to be stressed (moderate level of PS—769 (61.37%), high level of PS—224, (17.87%)).

The mean PSS of dentists during phase II was found to be significantly higher than in phase I (20.72 ± 1.95 Vs. 18.61 ± 6.87, $P < 0.0001$). Both the phases showed that dentists working in private sector had significantly higher mean PSS as compared to dentists used in government sector (19.33 ± 6.35 vs. 17.77 ± 6.27, $P = 0.0002$—phase I; 22.27 ± 6.12 vs. 18.96 ± 6.37, $P < 0.0001$—phase II). Moreover, dentists with an experience of less than 10 years had a significantly higher mean PSS than dentists having greater than 10 years work experience (20.86 ± 6.28 vs. 19.90 ± 6.81, $P = 0.009$) during phase II. When the mean PSS scores among different demographics were compared between phase I and phase II period, all the demographics showed highly significant results ($P < 0.0001$) and the higher value of mean PSS was reported in phase II period [Table 2].

Details of group-wise and phase-wise comparison of mean PSS of dentists has been given in Table 3 that indicated the mean PSS was significantly higher in phase II as compared to phase I for all the three groups ($P < 0.0001$). During phase I period, female dentists of group C (19.21 ± 6.40 vs. 17.79 ± 6.51, $P = 0.028$) and group A dentists of less than 35 years of age (19.67 ± 6.25 vs. 18.28 ± 6.75, $P = 0.016$) and with BDS degree (19.90 ± 6.40 vs. 18.00 ± 6.25, $P = 0.001$) displayed higher mean PSS that reached significance. Moreover, dentists used in private sector of all the three groups were significantly more stressed as compared to those engaged in government sector (group A-$P = 0.044$,group B—$P = 0.025$, group C—$P = 0.026$). During phase II, dentists with less than 10 years of experience (21.94 ± 6.37 vs. 20.03 ± 6.46, $P = 0.003$) of group C, group A dentists less than 35 years of age (23.45 ± 6.14 vs. 21.83 ± 6.22, $P = 0.003$), with BDS degree (22.47 ± 5.68 vs. 21.24 ± 6.21, $P = 0.027$)and with work experience of less than 10 years (23.00 ± 6.25 vs. 21.26 ± 7.13, $P = 0.003$) were reported to have

Table 1: Participant characteristics

S. no.	Participant characteristics	Frequency (%)
1.	Number of dentists in the list	3825
	Number of dentists contacted	3389 (88.60%)
	Number of dentists who agreed to participate	1756 (51.8%)
	Among those who agreed to participate	
	a. Number of dentists with systemic diseases	306 (17.4%)
	b. Number of drop outs and who didn't complete the survey form	197 (11.21%)
	c. Number of participants who completed the study	1253 (71.35%)
2.	Age	
	Mean Age	33.28 ± 7.64 Years
	<35 Years	697 (55.62%)
	>35 Years	556 (44.38%)
3.	Gender	
	Male	607 (48.45%)
	Female	646 (51.55%)
4.	Qualification	
	BDS	704 (56.19%)
	MDS/PhD	549 (43.81%)
5.	Years of Experience	
	< 10 Years	663 (52.91%)
	>10 Years	590(47.09%)
	Mean Years of Experience	6.85 ± 3.47 Years
6.	Type of work	
	Dental practitioners (GROUP A)	505 (40.30%)
	a. Private	414 (81.98%)
	b. Public/government	91 (18.02%)
	Academicians (GROUP B)	348 (27.78%)
	a. Private	254 (72.98%)
	b. Public/government	94 (27.02%)
	Both (GROUP C)	400 (31.92%)
	a. Private practice + private institute	268 (67%)
	b. Private practice + government institute	132 (33%)

significantly higher mean PSS than their fellow dentists. Private dentists of all the three groups had significantly higher stress scores than government dentists during phase II also, the highest score being the private dentists belonging to group A. Other details are shown in Table 4.

Table 5 shows the list of common stressors identified as occurring very often or always among the three different groups of dentists during phase I and phase II period.

Discussion

Ample amount of available literature has classified dentistry as a stressful job, reporting increased stress among dentists. The present study reported that 62.5% of Chhattisgarh dentists were dealing with psychological stress even otherwise, regardless of the COVID-19 lockdown aftermath which was in line with the results of previous studies done by Pouradeli *et al.*,[18] Osehal *et al.*,[19] Moors *et al.*[20] and Myers *et al.*[21] However, the COVID-19 outbreak and associated lockdown seem to have exaggerated the prevailing stress among dentists as percentage of dentists reported to perceive stressful situations increased to 79.24% in the present study. This was similar to Chinese health care workers[22] and physicians of Iraq[23] who were exposed to COVID-19 patients. Nevertheless, the frequency was much higher than that of Indian general public during the same situation.[24] Similarly, when compared with the available literature of stress level of Indian orthopaedic surgeons[25] and trainee opthalmologists[26] during COVID-19 flare up, the level of stress that dentists in the present study were facing is much higher (22.5% in case of orthopaedic surgeons and 54.8% in trainee ophthalmologists). The results also revealed a significant increase in mean stress score during the lockdown, irrespective of dentist's demographics (age, gender, qualification, years of experience or working in private or government sector) or whether the dentist is a practitioner, academician or both.

In the present study, before the spread of COVID-19 disease in the state, Chhattisgarh dentists working as practitioner as well as academician were most stressed followed by their compatriots who were working as practitioners only and lastly by dental academicians, which was in agreement with the previous study done by Pravallika *et al.*[27] Nonetheless as the COVID-19 spread flared up and was followed by the nationwide lockdown, young, general dentists with new setups were reported to be more stressed out which supported the results of a recent study on COVID-19 lockdown by Wang *et al.*[28] Also, the clinical decision-making skills, job satisfaction, and experiencing different clinical situations and facing odds clinically as well at personal front is found to be higher in specialist dentists who are more likely to handle stress efficiently than a novice.[29] Moreover, the higher levels of stress in comparison to their respective counterparts could also be attributed to the fact that individuals may suffer similar negative life events but appraise the impact or severity of these to different extents as a result of certain factors like differences in their biological responses to stressors, self-concepts, coping styles, emotional intelligence and social support.[30]

Evidence has suggested that stress among salaried government dentists is as high as that of private dental practitioners.[31] However, in the present study, regardless

Table 2: Comparison of mean perceived stress score among participant demographics

Variable	Mean perceived stress score (PSS)		*P* Value
	Phase I	Phase II	
Total dentists	18.61 ± 6.87	20.72 ± 1.95	<0.0001*
Gender			
Female	18.03 ± 6.16	20.41 ± 6.42	<0.0001**
Male	17.93 ± 6.31	20.69 ± 6.75	<0.0001**
P Value	0.776	0.468	
Age			
<35 years	17.93 ± 6.08	21.04 ± 6.31	<0.0001**
>35 years	17.65 ± 6.48	20.14 ± 6.31	<0.0001**
P Value	0.431	0.051	
Qualification			
BDS	17.93 ± 6.93	19.92 ± 6.37	<0.0001**
MDS	18.20 ± 6.32	20.14 ± 6.36	<0.0001**
P Value	0.477	0.544	
Yrs of experience			
<10 years	18.38 ± 5.66	20.86 ± 6.28	<0.0001**
>10 years	18.08 ± 6.26	19.90 ± 6.81	<0.0001**
P Value	0.373	0.009*	
Type of work			
Private	19.33 ± 6.35	22.27 ± 6.12	<0.0001**
Public/government	17.77 ± 6.27	18.96 ± 6.37	<0.0001**
P Value	0.0002*	<0.0001*	

Phase I: 1 month before the onset of COVID-19 in the state, Phase II: 1 month immediately following lockdown

*: Student *t* test, *P*-value significant at <0.05

**: paired *t* test, *P*-value significant at <0.05

Table 3: Comparison of mean perceived stress score between the participant groups

Participant group	Mean perceived stress score (PSS)		*P* Value (between the two phases)
	PHASE I	PHASE II	
GROUP A	18.74 ± 6.25	22.35 ± 6.72	<0.0001*
GROUP B	17.68 ± 6.48	18.56 ± 6.35	<0.0001*
GROUP C	19.42 ± 6.37	21.26 ± 6.09	<0.0001*
P –value (within the phase)	0.001**	<0.0001**	
Post hoc Tukey HSD test	A VS. B: p = 0.0441***	A VS. B: p< 0.0001***	
	B VS. C: p = 0.0006***	B VS. C: p< 0.0001***	
	C VS. A: p = 0.2463	C VS. A: p = 0.03***	

Group A: Dental practitioners, Group B: Academicians, Group C: Both

Phase I: 1 month before the onset of COVID-19 in the state, Phase II: 1 month immediately following lockdown

*: Paired *t* test, *P*-value significant at <0.05

**: one-way ANOVA, *P*-value significant at <0.05

***: *Post-hoc* Tukey HSD, *P*-value significant at <0.05

of the extraordinary circumstances of COVID-19 pandemic, dentists working in private sector (clinics/institutions) experienced higher level of stress than the dentists used in government hospitals or institutions. The results were in agreement with the previous studies done by Chukwuneke *et al.*,[32] Pravallika *et al.*,[27] and Newton *et al.*[33]

This study also attempted to identify the various stressors occurring as very often or always among the three different groups of dentists working in Chhattisgarh before and during the COVID-19 outbreak in the state. A number of stressors were identified that varied considerably not only among the different strata of dentists but also between the two phases of survey. Before the COVID-19 outbreak in the state, stress of getting infected or family member getting infected was the least common stressor among all the groups of dentists although the country had started witnessing rise in the number of cases during this period. This might had been due to the insufficient knowledge about the novel disease among dentists during that period. While dental academicians were most stressed due to lack of resources and facilities

Table 4: Comparison of mean perceived stress score among participant demographics of three different groups of dentists during Phase I and Phase II

Variable	Mean perceived stress score (PSS) PHASE I			Mean perceived stress score (PSS) PHASE II		
	GROUP A	GROUP B	GROUP C	GROUP A	GROUP B	GROUP C
Gender						
Female	18.76 ± 6.35	17.24 ± 6.25	19.21 ± 6.40	22.12 ± 6.22	19.28 ± 5.87	19.86 ± 7.26
Male	18.05 ± 5.89	16.81 ± 6.21	17.79 ± 6.51	22.67 ± 6.73	18.36 ± 6.12	20.04 ± 7.42
P-value	0.195	0.537	0.028*	0.342	0.168	0.807
Age						
<35 Years	19.67 ± 6.25	15.64 ± 5.81	18.48 ± 6.19	23.45 ± 6.14	18.04 ± 6.41	21.63 ± 6.38
>35 Years	18.28 ± 6.75	16.47 ± 6.24	18.21 ± 6.47	21.83 ± 6.22	18.28 ± 6.25	20.91 ± 6.46
P-value	0.016*	0.199	0.875	0.003*	0.724	0.273
Qualification						
BDS	19.90 ± 6.40	15.44 ± 7.21	18.47 ± 7.20	22.47 ± 5.68	17.52 ± 7.21	19.79 ± 6.21
MDS	18.00 ± 6.25	17.00 ± 6.28	19.61 ± 6.43	21.24 ± 6.21	18.36 ± 6.45	20.83 ± 6.44
P-value	0.001*	0.061	0.139	0.027*	0.322	0.133
Yrs of experience						
<10 Yrs	19.00 ± 5.32	16.68 ± 6.03	19.46 ± 5.63	23.00 ± 6.25	17.66 ± 6.24	21.94 ± 6.37
>10 Yrs	18.26 ± 6.21	17.24 ± 6.44	18.75 ± 6.14	21.26 ± 7.13	18.41 ± 6.86	20.03 ± 6.46
P-value	0.150	0.402	0.230	0.003*	0.286	0.003*
Type of work						
Private	19.68 ± 6.39	18.56 ± 6.22	19.77 ± 6.46	24.69 ± 6.25	21.44 ± 5.65	20.67 ± 6.48
Public/government	18.21 ± 5.87	16.84 ± 6.73	18.26 ± 6.23	19.21 ± 6.81	18.69 ± 6.08	19.00 ± 6.23
P-value	0.044*	0.025*	0.026*	<0.0001*	<0.0001*	0.014*

Group A: Dental practitioners, Group B: Academicians, Group C: Both

Phase I: 1 month before the onset of COVID-19 in the state, Phase II: 1 month immediately following lockdown

*: student t-test, P-value significant at <0.05

in their institutions, poor relationship with colleagues and fear of losing job, dental practitioners and dentists working as both practitioner and academician were most concerned about the long working hours as a result of which they were unable to give adequate time to family followed by concern about earning enough to meet lifestyle needs and competition with fellow dentists, which was in agreement with the previous studies done by Cooper *et al.*,[34] Ayers *et al.*,[14] Myers *et al.*,[21] and Pouradeli *et al.*[18]

As opposed to phase I, during the phase II period, the most commonly recognized sources of stress during usual times were replaced by altogether different and new forms of stressors. Concern about COVID-19 contagion and getting infected with it was one of the most frequent sources of stress among all three groups of dentists. Dentistry is a profession that involves working in close proximity to the oral cavity and its secretions, and use of aerosol producing devices is unavoidable in most of the dental procedures due to which the risk of getting infected is heightened and so also the anxiety associated with it.[35] Moreover, the unavailability of any specific treatment of the novel disease and the prevailing uncertainty adds to an individual's sense of unease, leading to loss of hope and initiative.[34] Misinformation and sharing of fake news through social media are other factors that might cause increased stress related to contagion.[36]

Financial stress and anxiety are important aspects of financial mental health that can impact a person's cognitive, emotional, and relational well-being.[37] The COVID-19 pandemic has not only caused an unprecedented health crisis but has also triggered an economic downturn for almost all the large and small scale sectors, where millions of fellow citizens are on the verge of losing their jobs and the dental healthcare sector is no exception. In the present study also, ever since the lockdown was imposed, dentists, regardless of which group they belonged to, seemed to be struggling with financial hardships as most of them were concerned about losing their job or loss of earning in the practice or practice requiring high investments in infection control procedures. The GOI has implemented policies to sanction loans for Dental Clinics under MSME scheme. However no such schemes are of any benefit to sole dental academicians. Since financial stress factor has not been studied previously in COVID-19 related literature, rendering it impossible to be compared with pertinent literature in this manuscript.

Another interesting finding of the present study was an upsurge in domestic problems like children's education, lack of personal space and boredom, domestic fights,

Table 5: Sources of stress during Phase I and Phase II among different participant groups

	Sources of stress among different participant groups					
	GROUP A	FREQ.(%)	GROUP B	FREQ.(%)	GROUP C	FREQ. (%)
Phase I	a. Long working hours so no time for family	330(65.34)	a. Lack of resources and facilities, poor working conditions	251(72.1)	a. Long working hours so no family time	360(90)
	b. Earning enough money to meet lifestyle needs	312(61.70)	b. Poor relationship with colleagues	246(70.6)	b. Lack of appreciation by patient/authorities in institute	287(71.75)
	c. Competition with other dentists	281(55.64)	c. Fear of losing job leading to loss of income	237(68.1)	c. Domestic problems	264(66)
	d. Coping with difficult patients	234(46.33)	d. Unrealistic expectations from the authorities	208(59.7)	d. Competition with other dentists or colleague in institute	222(55.5)
	e. Collecting payments	216(42.77)	e. Workload pressure	197(56.6)	e. Repetitive nature of work	215(53.75)
	f. Unsatisfactory auxiliary/lab services	212(41.98)	f. Lack of appreciation and benefits	183(52.8)	f. Concern over their ability to provide services in future	193(48.25)
	g. Repetitive nature of work	197(30.09)	g. Difficult interactions with students	134(38.5)	g. Decision about future career options	104(26)
	h. Possibility of making mistakes	163(32.22)	h. Domestic problems	119(34.1)		
	i. Feeling underrated by patients	121(23.96)	i. Limited participation in decision making	111(31.8)		
	j. Concern over the ability to provide dental services in future	106(20.99)				
	k. Domestic problems	101(20.00)				
	i. Getting infected or family member getting infected by unknown COVID19 patient					
Phase II	a. Getting infected or family member getting infected by unknown COVID19 patient	421(83.33)	a. Fear of losing job resulting in loss of income	269(77.29)	a. Stress of getting infected or family member getting infected by COVID19	293(73.25)
	b. High investments required for infection control practices when the clinic re-opens	410(81.18)	b. Stress of getting infected or family member getting infected by COVID19	236(67.8)	b. High investments required for infection control practices when the clinic re-opens	233(58.25)
	c. Loss of earning	389(77.02)	c. Workload pressure	201(57.75)	c. Concern about future of practice	226(56.5)
	d. No work to do	305(69.39)	d. Domestic problems	(38.39)	d. Loss of earning	194(48.5)
	e. Concern about future of practice	288(67.02)			e. Workload pressure	118(29.5)
	f. Domestic problems	240(47.52)			f. Domestic problems	102(25.5)
	g. What if other clinics are open and patient going to those clinics	116(22.9)				
	h. Feeling isolated	89(17.6)				

Phase I: Last working month before lockdown, Phase II: 1 month immediately after lockdown Group A: Dental practitioners, Group B: Academicians, Group C: Both

and sudden need of looking after the whole family among dental practitioners and dental academicians during the period of lockdown. Similar results were reported by the studies done by Bradbury-Jones *et al.*[38] and Wang *et al.*[39] among general population.

This phenomenon of increased psychological stress during COVID-19 outbreak and associated lockdown could be ephemeral which may subside when the situation dampens or when dentists learn and adapt to the situation. Stress can never be totally eliminated but can be minimized to some extent by various distraction methods or participation in stress management courses, seminars, and educational programs.[14] However, if this distress is in excess, as observed in about 17.87% of dentists, or persists even after COVID-19 flattens, it might lead to unwanted patho-physiological consequences on a person's health, which would need professional help.[40] Such vulnerable dental practitioners need to be carefully screened to identify and treat evolving mental disorders. The dental key opinion leaders need to work with concerned authorities to develop certain policies and guidelines that provides a passable space for monitoring, screening, referral, and interventional care such that the stress level is minimized. Adequate COVID-19 lockdown exit strategies for dentists should also be formulated that focuses on better working protocols for infection control, faster and reliable screening and diagnostic tools, making barrier materials available at cheaper rates and vigorous mental health and monetary support system.

The self-reporting bias was the major limitation of the study. The response rate of the study was not ideal. The present study couldn't determine precisely how the respondent dentists differed from the non-responders. However, when the socio-demographic characteristics of our sample were compared with all dentists on the Dental Register no statistically significant differences were found. Thus, the findings of the present study can be generalized to all the dentists of Chhattisgarh (assuming that the two groups did not differ with respect to any other characteristics). Additionally, the study was restricted to dentists working in the Chhattisgarh state of India. Further research among the entire dental fraternity of the country is warranted for better understanding of the present model.

Conclusion

The present study confirms that Chhattisgarh dentists are reeling under psychological stress amid the COVID-19 spread and its associated lockdown, the private dental practitioners experiencing the highest level of PS. There is a considerable variation in the stressors experienced by the dentists, although concern about contracting the infection and financial implications were the two most common sources of stress among the dentists. Adequate formulation of policies and guidelines for a safer clinical practice and vigorous mental and monetary support to dental fraternity is the need of the hour.

Acknowledgement

The study was self-funded.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Authors contributions

SM: concept, study design, manuscript writing; SS: literature search, data collection; VT: statistical analysis, manuscript editing; BV: manuscript editing, data analysis; NK: manuscript editing, manuscript review; PB: manuscript review.

Ethical policy and institutional review board statement

The study was reviewed by institution's ethical review board (GDCHR/ERB/2020/11).

Patient declaration of consent

Not applicable.

Data availability statement

Upon reasonable request, the data set analyzed during this study is available from the corresponding author (Dr. Supriya Mishra, E-mail: dr.supriya4@gmail.com).

References

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, *et al*. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727-33.
2. Gorbalenya AE, Baker SC, Baric RS, Groot RJ, Drosten C, Gulyaeva AA, *et al*. The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. Nat Microbiol 2020;5:536-44.
3. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, *et al*. World health organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). Int J Surg 2020;76:71-6.
4. Gupta N, Praharaj I, Bhatnagar T, Wesley J, Thangaraj V, Giri S, *et al*. Severe acute respiratory illness surveillance for coronavirus disease 2019, India, 2020. Indian J Med Res 2020;151:236-40.
5. Mishra R. Coronavirus: First case of Covid-19 infection reported in Chhattisgarh. 19 March 2020. Available from: https://www.hindustantimes.com/india-news/coronavirus-firstcase-of-covid-19-infection-reported-in-chhattisgarh/story-UETZX1YjdbyeuUHi3OQqfL.html.

6. Pulla P. Covid-19: India imposes lockdown for 21 days and cases rise. BMJ 2020;368:m1251.
7. Zemouri C, de Soet H, Crielaard W, Laheij A. A scoping review on bio-aerosols in healthcare and the dental environment. Plos One 2017;12:e0178007.
8. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. Int J Oral Sci 2020;12:9.
9. Farooq I, Ali S. COVID-19 outbreak and its monetary implications for dental practices, hospitals and healthcare workers. Postgrad Med J 2020. doi:10.1136/postgradmedj-2020-137781.
10. Greenberg N, Docherty M, Gnanapragasam S, Wessely S. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. BMJ 2020;368:m1211.
11. Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by healthcare workers due to the COVID-19 pandemic: A review. Asian J Psychiatr 2020;51:102119.
12. Cai H, Tu B, Ma J, Chen L, Fu L, Jiang Y, *et al*. Psychological impact and coping strategies of frontline medical staff in Hunan between January and March 2020 during the outbreak of coronavirus disease 2019 (COVID19) in Hubei, China. Med SciMonit 2020;26:e924171.
13. Patini R. How to face the post-SARS-cov-2 outbreak era in private dental practice: Current evidence for avoiding cross-infections. J Int Soc Prev Community Dent 2020;10:237-9.
14. Ayers KM, Thomson WM, Newton JT, Rich AM. Job stressors of New Zealand dentists and their coping strategies. Occup Med (Lond) 2008;58:275-81.
15. Cohen S, Williamson G. Perceived stress in a probability sample of the United States. In: Spacapan S, Oskamp S, editors. The Social Psychology of Health. Newbury Park, CA: Sage; 1988.
16. Du J, Dong L, Wang T, Yuan C, Fu R, Zhang L, *et al*. Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. Gen Hosp Psychiatry 2020. doi: 10.1016/j.genhosppsych.2020.03.011.
17. Yun GW, Trumbo CW. Comparative response to a survey executed by post, E-mail, & Web Form. J Comput Mediated Commun 2000;6:1.
18. Pouradeli S, Shahravan A, Eskandarizdeh A, Rafie F, Hashemipour MA. Occupational stress and coping behaviours among dentists in Kerman, Iran. Sultan Qaboos Univ Med J 2016;16:e341-6.
19. Ousehal L, Lazrak L, Hassani K. Evaluation of stress among 100 Moroccan orthodontists. Open J Stomatol 2011;1:1-6.
20. Moore R, Brødsgaard I. Dentists' perceived stress and its relation to perceptions about anxious patients. Community Dent Oral Epidemiol 2001;29:73-80.
21. Myers HL, Myers LB. 'It's difficult being a dentist': Stress and health in the general dental practitioner. Br Dent J 2004;197:89-93; discussion 83; quiz 100-1.
22. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, *et al*. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Netw Open 2020;3:e203976.
23. Abdulah DM, Musa DH. Insomnia and Stress of Physicians during COVID-19 Outbreak. Sleep Med X 2020;2:100017.
24. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. Asian J Psychiatr 2020;51:102083.
25. Sahu D, Agrawal T, Rathod V, Bagaria V. Impact of COVID 19 lockdown on orthopaedic surgeons in India: A survey. J Clin Orthop Trauma 2020;11:283-90.
26. Mishra D, Nair AG, Gandhi RA, Gogate PJ, Mathur S, Bhushan P, *et al*. The impact of COVID-19 related lockdown on ophthalmology training programs in india - outcomes of a survey. Indian J Ophthalmol 2020;68:999-1004.
27. Pravallika TS, Reddy JR, Jyothi M, Akula S, Anjum MD, Rao KY. Comparison of psychological health status among dental practitioners, academicians and who are both in Telangana state: A cross-sectional study. EC Dent Sci 2020;19:01-7.
28. Wang Y, Di Y, Ye J, Wei W. Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China [Internet]. Psychol Health Med 2020;8506:1e10.
29. Alani A, Bishop K, Djemal S. The influence of specialty training, experience, discussion and reflection on decision making in modern restorative treatment planning. Br Dent J 2011;210:E4.
30. Nayak AS, Parkar SR, Nachane HB, Sangoi BA, Shinde RG. Gender variability of perceived stress and negative inferential feedback in depression. Indian J Psychol Med 2019;41:331-7.
31. Humphris GM, Peacock L. Occupational stress and job satisfaction in the community dental service of North Wales: A pilot study. Community Dent Health 1993;10:73-82.
32. Chukwuneke FN, Akaji EA, Okoye LO, Ekwueme OC, Anyanechi CE. Occupational stress in dental practice amongst government-employed and private dental practitioners in Eastern Nigeria: A comparative survey. Tanz Dent J 2010;16:18-22
33. Newton JT, Gibbons DE. Stress in dental practice: A qualitative comparison of dentists working within the NHS and those working within an independent capitation scheme. Br Dent J 1996;180:329-34.
34. Cooper CL, Watts J, Kelly M. Job satisfaction, mental health, and job stressors among general dental practitioners in the UK. Br Dent J 1987;162:77-81.
35. Dave M, Seoudi N, Coulthard P. Urgent dental care for patients during the COVID-19 pandemic. Lancet 2020;395:1257.
36. Mackolil J, Mackolil J. Addressing psychosocial problems associated with the COVID-19 lockdown. Asian J Psychiatr 2020;51:102156.
37. Archuleta KL, Dale A, Scott M. College students and financial distress: Exploring debt, financial satisfaction, and financial anxiety. J Fin Counsel Plan 2013;24:50-62.
38. Bradbury-Jones C, Isham L. The pandemic paradox: The consequences of COVID-19 on domestic violence. J Clin Nurs 2020;29:2047-9.
39. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. Lancet 2020;395:945-7.
40. Phillips MR. Is distress a symptom of mental disorders, a marker of impairment, both or neither? World Psychiatry 2009;8:91-2.