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# Stress level of dentists during COVID-19 pandemic in hot spots of Tamil Nadu: A cross-sectional study

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## Abstract:

**BACKGROUND:** The novel 2019 COVID-19 spreads by respiratory and aerosols, and this elevates the risk of dentistry during this pandemic. Widespread disease, in a short time, creates stress and has a psychological impact. The aim of this study was planned to assess the stress level of the dentists living or practicing or studying in hot spots which could help to understand mental status among the general dentists during COVID-19 lockdown.

**MATERIALS AND METHODS:** This cross-sectional study was conducted during the period of August 10 to August 25, 2020, on an Internet platform after getting consent from the dentists and practitioners using the Perceived Stress Scale (PSS). Chi-square association was used. Parametric tests such as independent *t*-tests and one-way ANOVA were also used. In all instances,  $P < 0.05$  was considered statistically significant.

**RESULTS:** This study had a total response from 1044 dental students and dentists residing in hot spot zones in Tamil Nadu. Out of them, 68.4% were female and 31.6% were male. 37.9% of the participants were dental practitioners and 32.5% were undergraduate students. There is a significant association between age groups and PSS, work style, and PSS. There is no significant association between gender and PSS and degree and PSS.

**CONCLUSION:** This study shows that levels of distress were higher than expected during the COVID-19 pandemic among the dentists and majority of the respondents have moderate-to-high-stress levels. As the unlock has been started throughout the country, it is the right time to work with the authorities and focus on formulating protocols for disinfection and sterilization and work on treating the patients with exact safety measures for the welfare of the patients.

## Keywords:

Anxiety, depression, pandemic, safety

## Introduction

COVID-19 outbreak caused by coronavirus is one of the biggest medical challenges to humankind in recent times. The upsurge of COVID-19 infection in China was in December 2019; from then, it has escalated to almost all the countries of the world by January–February 2020.<sup>[1]</sup> The World Health Organization declared COVID-19 to be a pandemic on March 11, 2020, and as on August 13, 2020, near about 2,416,181 cases have been confirmed

and more than 47,325 deaths have been reported in India. The first confirmed case of COVID-19 was reported on January 30, 2020.<sup>[2]</sup> As a containment initiative, the nation was placed on a total lockdown from early hours of March 25, 2020.<sup>[3]</sup> Four phases of lockdown have been established and unlock from June 1 phase 1.0 was started. People have been rigorously advised to maintain social distance, wear a mask, and sanitize their hands often.<sup>[4]</sup>

India being a densely populated country faces increased challenges in the medical

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sector which additionally initiates problems<sup>[5]</sup> that heighten psychological distress. Fear of infection about the disease during an epidemic or pandemic is quite usual which leads to stress, depression, and anxiety.<sup>[6]</sup> The word stress suggested experience of negative emotions that happen in the wake of anticipated physiological, cognitive, and behavioral changes that work toward either altering the stressor or creating adjustments to its effects.<sup>[7]</sup> On the other side, the fear of the unknown is termed anxiety that is the body's natural response to stress. A mental health disorder which is characterized by constant depressed mood or loss of interest in activities causes significant impairment in daily life.

Abiding the government rules due to COVID-19 lockdown, most of the dental practices and hospitals in India have been closed since March 25.<sup>[8]</sup> Only emergency and urgent cases were treated, and in such circumstances, very meticulous infection control procedures should be implemented.<sup>[9]</sup> Due to the sudden lockdown and continuous extension of it, dentists were encountering two major issues.<sup>[10]</sup> The first one is fear of getting infection while treating patients as dentists work in very close contact with the patients. The second major issue will be fear of limited working clinical hours even in future and also massive price increase in masks, gloves, and protective equipment which makes the dentist to demand more from the patients. Widespread disease, in a short time, creates stress and has a psychological impact. As dentists fall under high-risk groups for this current infection, this study was planned to assess the stress level of the dentists living or practicing or studying in red zones which could help to understand mental status among the general dentists during COVID-19 lockdown.

## Materials and Methods

### Study design and setting

This cross-sectional study was conducted during the period of August 10 to August 25, 2020, on an internet platform after getting consent from the dentists and practitioners.

### Study participants

The participants were approached using social media and E-mails ( $n = 1044$ ). The study included undergraduate students, BDS graduates, postgraduate students, and practitioners residing in hot spot zones of COVID-19 (having high incidence of tested positive patients by reverse transcription–polymerase chain reaction) in Tamil Nadu.

### Sampling and sample size

Participants were selected using a convenient sampling method. Sample size was calculated using the previously published article<sup>[11]</sup> by keeping 95% confidence interval

and 5% of type II error using GPower version 3.0 software.

### Data collection tool

A prevalidated questionnaire containing demographic details and 10-item questionnaires of the Perceived Stress Scale (PSS) was prepared and shared with the dentists and dental students through E-mail, Instagram, Facebook, and WhatsApp. The mail addresses of them were obtained from the Indian Dental Association of the particular district. Anonymity of the participants was maintained and no personal information of the participants was included in the survey. Basic demographic details such as age (<25, 25–30, 31–35, 36–40, and >40 years), gender, degree, and work style (academic, practice, and both) were included at the start of the study. This survey used a previously validated 10-item questionnaire – PSS.<sup>[12]</sup> The items in this questionnaire were easy to understand and interrogated mostly about feelings and thoughts during the last month. Perceived Stress Scale scores ranging from 0-13 would be considered low stress whereas scores between 14-26 would be considered as moderate stress and scores ranging from 27-40 would be considered as high stress.

### Ethical considerations and informed consent

Ethical approval to conduct the study was obtained from the author's university scientific review board. Informed consent was obtained from the participants before the commencement of the study.

### Statistical analysis

Statistical analysis was done using the Statistical Package for the Social Sciences version 23 (IBM Corporation., New York, USA). Descriptive statistics such as mean with standard deviation (SD) for continuous variables and proportions for nominal variables were calculated. Normality test was done using Kolmogorov–Smirnov numerical test. The data were found to be normally distributed ( $P > 0.05$ ). Chi-square association test was done to compare the proportions. Parametric tests such as independent  $t$ -tests and one-way ANOVA were done to compare the means. In all instances,  $P < 0.05$  was considered statistically significant.

## Results

This study had a total response from 1044 dental students and dentists residing in hot spot zones in Tamil Nadu. Out of them, 68.4% were female and 31.6% were male, with females having a higher mean score for stress ( $21.59 \pm 5.92$ ). There was no significant difference in the mean stress between males and females ( $P > 0.05$ ). 23.4% of the respondents were in the age group of 31–35 years, 20.2% were in 25–30 years,

19.8% of the participants were below 25 years, 18.4% of the participants were above 40 years, and 17.7% of the participants were between 36 and 40 years. Respondents in the age group of 25–35 years had a high mean of stress with a significant difference compared with other age groups. 37.9% of the participants were dental practitioners and 32.5% were undergraduate students. BDS graduates had a high mean for stress score with no significant difference. The mean stress score was found to be high ( $21.58 \pm 6.12$ ) among the participants pursuing both academic and practice work styles with a statistically significant difference ( $P < 0.05$ ) [Table 1].

Respondents <25 years had a higher prevalence of stress (84.5%) when compared with older age groups [Figure 1]. It was very clear that the younger generation faces challenges in stress handling. 80.6% of the orthodontists faced a higher prevalence of stress during COVID-19 pandemic followed by dentists pursuing oral medicine and radiology [Figure 2]. Orthodontists' stress would be relatively high among all because their success of the practice relies on their regular appointments, and due to this lockdown, there are skipped appointments of their cases. Out of 1044 respondents, 82.5% of the females faced more stress compared with males (79.6%) [Figure 3]. Among them, the prevalence of moderate level of stress was high in respondents with work style of both academic and practice. However, participants with academic type of work style faced a high level of stress than others [Figure 4]. About 72.4% of the participants had a moderate level of stress, 19.8% had a high level of stress, and 7.8% had a low level of stress [Figure 5].

### Discussion

PSS by Sheldon Cohen is a convenient, elaborate tool to measure psychological stress, allowing inclusion of additional tools within the same research. From the current study results, female respondents show a higher percentage of stress (20.2%) than male respondents (14.3%). A similar study result was obtained among Pakistani dental students during COVID-19 pandemic.<sup>[13]</sup> According to Arun Prakash M *et al.*, male dentists have more stress levels than females which is in contrast to our study.<sup>[13,14]</sup>

Among all respondents, 78.1% of the postgraduate dental students possess moderate stress followed by BDS graduates (73.2%). This may be due to the fact that postgraduates may be worried more about their academic year and change of atmosphere in their dentistry life more than others as they have to be the frontline warriors whatever the situation may be. It was found that younger age groups <25 and 25–35 years

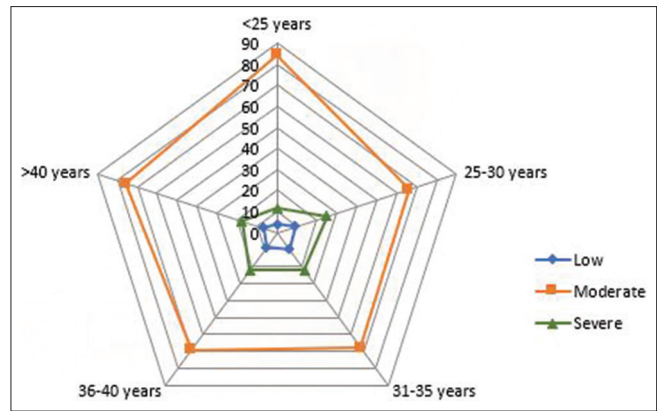


Figure 1: Radar graph showing distribution of stress among participants of different age groups

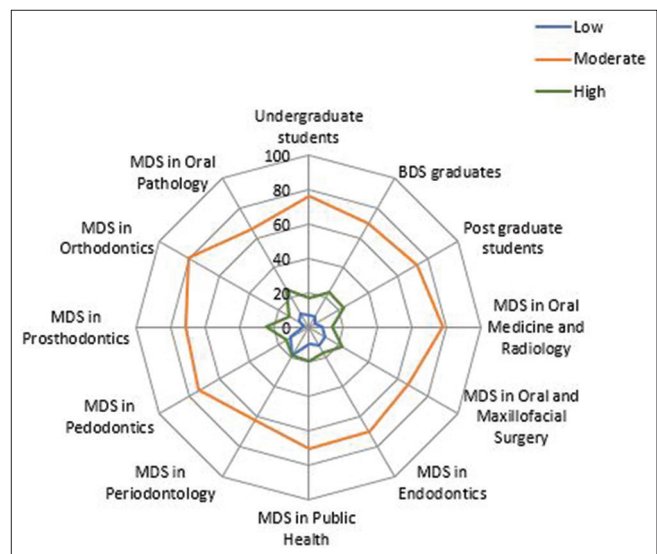


Figure 2: Radar graph showing distribution of stress among the participants based on their degree obtained

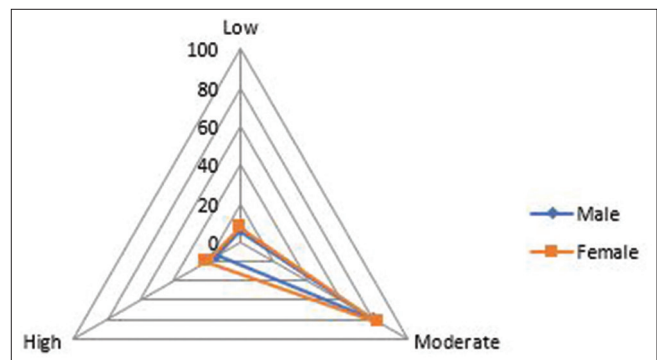


Figure 3: Radar graph showing distribution of stress among participants based on their gender

had 3–5 times higher prevalence of moderate and severe PS (PSS scale) in comparison with older age groups. According to Anil Kumar Ramachandran Nair, dentists who are 25–35 years old have high-stress levels during the pandemic.<sup>[11]</sup> However, these results are

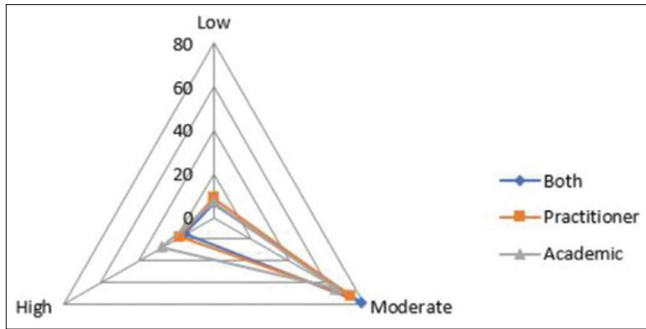


Figure 4: Radar graph showing distribution of stress among the participants based on their work style

Table 1: Mean distribution of Perceived Stress Scale among dental students and dentists

Demographic variables	n (%)	Mean±SD; median	P
<b>Age group (years)</b>			
<25	207 (19.8)	21.22±4.66; 22	0.038
31–35	211 (20.2)	22.09±6.19; 22	
36–40	249 (23.9)	21.14±6.61; 21	
>40	185 (17.7)	21.48±6.31; 21	
<b>Gender</b>			
Male	330 (31.6)	21.45±6.03; 21	0.828
Female	714 (68.4)	21.59±5.92; 22	
<b>Degree</b>			
Undergraduate students	339 (32.5)	21.26±5.92; 22	0.232
BDS graduates	285 (27.3)	22.47±5.75; 22	
Postgraduate students	91 (8.7)	21.86±4.71; 22	
MDS in oral medicine	37 (3.5)	22.00±6.53; 22	
MDS in oral surgery	27 (2.6)	19.44±7.20; 20	
MDS in endodontics	64 (6.1)	20.80±7.01; 22	
MDS in public health	31 (3.0)	19.84±6.62; 18	
MDS in periodontology	37 (3.5)	20.59±6.81; 22	
MDS in pedodontics	34 (3.3)	21.06±6.01; 21	
MDS in prosthodontics	32 (3.1)	21.13±6.12; 21.5	
MDS in orthodontics	32 (3.1)	22.00±4.37; 22	
MDS in oral pathology	35 (3.4)	21.40±6.18; 20	
<b>Work style</b>			
Academic	339 (32.5)	21.58±6.12; 22	0.028
Practice	396 (37.9)	21.37±5.82; 21	
Both	316 (30.9)	21.43±5.96; 22	

SD=Standard deviation

not coinciding with a study conducted among Chinese population.<sup>[15]</sup> It has been found that age plays a vital role in stress and stress-related functions.<sup>[15-17]</sup> Among the study participants, more dental practitioners participated in the study (37.9%).

Among all the specialization departments in dentistry, orthodontists had higher levels of moderate stress among all followed by oral medicine and radiology. This is because when compared to other specialties including postgraduate students (trainees) and consultants, they might have additional sources of income, but this is not the case with orthodontists. Since orthodontic treatments require long period

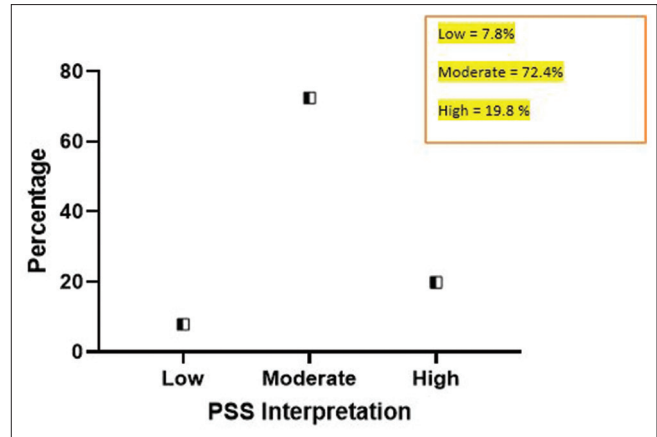


Figure 5: Overall distribution of stress among the dentists

of time to complete the procedure and monthly visits were required regularly, this Covid lockdown directly impacts the appointments which impacts the case results too.<sup>[18]</sup> This immediate downward spiral in income could be a major blow for this subgroup. It is also observed that postgraduates have an increased risk of stress as compared to others.<sup>[19,20]</sup>

Novelty of the study was it has estimated the stress among dentists during the first wave of COVID-19 infection and it has included more than 1000 dental graduates and practitioners.

### Limitations

The limitation of this study would be not considering the other Indian states and self-reporting bias. Further studies are needed to focus on the various important red zone areas in India to generalize the study results.

### Recommendations

Dentists all over the world started experiencing stress and depression due to COVID-19 pandemic situation. This needs further epidemiological studies to evaluate the long-term impact of mental health. Dentists should give importance in understanding of the pandemic situation and its infection and risk in their dental practice and find a way to overcome the risks in future.

### Conclusion

This study shows that levels of distress were higher than expected during the COVID-19 pandemic among the dentists and majority of the respondents have moderate-to-high-stress levels. Postgraduates in younger age groups <25 years have more stress during this pandemic according to the study results. As the unlock has been started throughout the country, it is the right time to work with the authorities and focus on formulating protocols for disinfection and sterilization



and work on treating the patients with exact safety measures for the welfare of the patients.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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