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## Stress of COVID-19 on dental postgraduates of India – A questionnaire-based survey

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### ABSTRACT

*The rapid, sudden and extensive spread of the COVID-19 pandemic has become a major cause of concern for the healthcare profession. Dentists and dental students are at the highest risk of infection. This questionnaire-based study aims to assess the stress level because of COVID-19 disease and related infection among dental postgraduate students in various states of India. It was concluded that dentists or dental students are more anxious and fearful about COVID-19 because of the loss of academic and clinical hours along with high-risk infections during clinical procedures.*

**Keywords:** Stress, Dental, Postgraduates, Coronavirus

### 1. INTRODUCTION

The outbreak of covid-19 was started in Wuhan, China in the last months of 2019, but has reached every country rapidly in less than a year causing a serious public health crisis.[1] Coronavirus, a family of corona viridae which is a single-stranded RNA transmitted through the airway (sneezing, cough, droplet inhalation) or by direct contact with the person.[2] There have been more than 500,000 reported cases and 23000 deaths worldwide and this number continues to increase every day, according to the WHO (March 27, 2020) update on COVID-19[3]. Therefore, measures for the identification and management must be done to prevent further spread by following the principle of universal precaution and special precautionary measures that should be targeted toward aerosol transmission.

The average incubation period ranges from 4 to 14 days.[4] The infected person usually presents with upper respiratory tract infection (RTI) and complaints of high-grade fever, a dry cough, headache, myalgia, dyspnea [5] reduced sense of smell (hyposmia), and abnormal taste sensation (dysgeusia) [6]. Dental professionals and dental students are at high risk for this nosocomial infection and can become carriers of this disease. Dental setups carry the risk of 2019-nCoV infection because of aerosol-generating procedures, the proximity of the dentist to the oropharyngeal region, frequent exposure to saliva, blood, and other body fluids, through inhalation of airborne microorganisms that can remain suspended in the air for long periods [7] and the handling of sharp instruments.[8]

The use of personal protective equipment (PPE), including masks, gloves, gowns, and goggles or face shields, is recommended to protect skin and mucosa from potentially infected blood or secretion generated during dental procedures. The N-95 masks authenticated by the National Institute for Occupational Safety and Health or FFP2-standard masks set by the European Union are recommended for a routine dental practice to prevent respiratory droplet infection.[9] The COVID-19 pandemic leads to fear, stress, and anxiety among dental professionals by social, electronic, digital, and print media as they are being on the list of high-risk professions.[10]

Therefore, we have conducted a questionnaire-based study to evaluate the stress generating among postgraduate dental students from various states in India during this pandemic.

The present study aimed to assess anxiety, stress, fear of getting infected, loss of the academic year, professional loss among postgraduate dental students working during the current viral outbreak. Besides, postgraduate knowledge about various practice modifications, preventive measures, to combat the novel coronavirus disease (COVID-19) outbreak has also been evaluated.

## **2. MATERIALS AND METHOD**

The present cross-sectional study was conducted using an online survey questionnaire prepared on [www.docs.google.com](http://www.docs.google.com) from 15th September to 25th September 2020. For this purpose, a well-constructed questionnaire was designed. Content validation was established by revising and redesigning the questionnaire by a group of five experts in pediatric dentistry. Based on their suggestions, overlapping and unrelated questions were removed, leaving 45 close and open-ended questions. The online survey link was circulated through social media and an e-mail to dental postgraduate students in the various dental institute, all over different states of India stating the objectives of the survey and received a response through an online survey submission.

A total of 109 participants from different dental institutes all over India participated and submitted the questionnaire, excluding some unfilled or partially filled forms. The questionnaire was comprised of a total of 45 questions including open and closed-ended questions which were divided into two sections. The first section focused on the general information, daily habits, general precautions they take during this pandemic among postgraduate dental students, and the second section was designed to gather information about their stress level, practice modifications to combat the COVID-19 outbreak following the Centers for Disease Control and Prevention (CDC). On subsequent reminders to all nonrespondents, finally, 122 replies could be received at the end of 10 days. The data were analyzed using descriptive statistics.

## **3. STATISTICAL ANALYSIS**

Statistical analysis was performed by STATA to compare the stress among different individuals in different groups. The Chi-square test showed insignificant results so regression analysis was performed.

## **4. RESULTS**

Results indicate the health status and routine habits (figure 3) of postgraduate students (table 1), various exercises to prevent any infection (figure 2), and stress of various kinds (Table 2) during this pandemic. The stress level was more in females than men (figure 1) with various symptoms like headache, myalgia, etc. (figure 4) and postgraduates showed fear of loss of clinical hours and academic hours due to COVID-19 (Table 2). Those students who are far away from parents and family showed significant results ( $p < 0.05$ ) with mostly fear of incompleteness of thesis ( $p < 0.05$ ) [Table 3]. Descriptive statistics including mean, median are mentioned in table 4 and 5.

## **5. DISCUSSION**

The total number of postgraduate students who responded was 122. Out of which 66.9% were females and 33.1% were males from different private and government colleges of India. Students who were taking adequate sleep of more than 6 hours were 50.4% and 11.6% of students were taking less than 5 hours of sleep. Out of them, students involved with physical activities like 11.2% were going to a regular gym, 3.6% yoga, 1.1% aerobics, 58.4% were involved with regular walking and jogging. Studies have shown that regular exercise can significantly improve the immune capacity of the body reduce the probability of infection and provide a new way for the treatment of COVID-19.[11]

Students taking health supplements regularly were 27.3% and 9.1% were taking health supplements sometimes. Immunity booster preparation like kadha, Tulsi, Chawanprash, etc. was taken by 46.3% of students regularly while 11.6% were taking these sometimes. Vit C, Vit D3, and zinc supplements regularly were taken by 45.5% of postgraduates. To support immune function during COVID-19 disease higher dietary intakes of vitamins D, C, and E, zinc, and omega-3 fatty acids could be beneficial.[12] Zinc is a vital mineral during COVID-19 infection because of its dual function, immunomodulatory and anti-viral properties.[13] Students who were regularly using mouthwashes and gargles were 30.8%. In dental practice, the use of mouthwash (1% hydrogen peroxide or 0.2% povidone-iodine) and use of rubber-dam during operative procedures are recommended which will reduce the colony-forming units in dental aerosols and prevent aerosol generation respectively.[14] Mouthwashes are commonly used solutions for rinsing the mouth, especially before oral surgery, due to their ability to reduce the number of microorganisms in the oral cavity but there is still no clinical evidence that the use of mouthwashes could prevent SARS-CoV-2 transmission. The American Dental Association (ADA) and the Center for Disease Control and Prevention (CDC) have recommended the use of mouthwashes before oral procedures in dental practice.[15,16]

When it comes to infection control, N95 masks with particle filters are preferred in this pandemic. These include three layers, being hypoallergenic, forming a liquid barrier, being tear-resistant, and providing 99% bacteria and 95% particle filtration.[17] Students who were using the N95 mask regularly were 77.7% High-speed handpiece in dental practice generates heat due to friction between tooth and bur, this heat can damage the vital tooth and other hard tissues, to prevent these pathological changes use of water coolant is very important during dental procedures which will cause aerosol generation during tooth preparation, oral prophylaxis and oral surgery.[18]

Students (76.9%) were fearful of doing aerosol-generating procedures in our study. These aerosols are commonly contaminated with bacteria, fungi, and viruses, have the potential to remain in the air for a long time and can be inhaled by dentists or other patients.[19]

Most of the students (75.6%) were fearful about the incompleteness of the thesis 89.8% were fearful of not getting enough patients, 79.8% were fearful about the loss of clinical hours. Clinical students are in contact with patients during dental treatment and so the risk of infection transmission is higher for clinical than for nonclinical students.[20] Dental students have increasing

patient contact during their education and clinical years which Inevitably, may cause anxiety due to the high viral exposure to frontline medical personnel involved in disease incidences and deaths. Half of the students (51.3% )thought that webinars are really useful, these results are similar to another study (Mukhtar. K et al 2020 ) [21] where fewer students supported the online study may be because the attention span during online learning was even shorter than face to face sessions.[22] Postgraduates (50%) were having invivo thesis topic, 43.6% were having invitro and 6.4% were having other topics. 63%.Students thought that practicing invitro may be helpful.

Considering the stress level among post-graduates various symptoms were associated with stress like 23.5% were having insomnia, 35.3% restlessness,39.5% headache, 14.3% had myalgia,39.5% were having a headache. Most of them (50.4 % ) postgraduates believed that covid has changed their life severely and the majority of the students (76.5% )thought that post covid situation won't be the same as before. It should be noted that during the COVID-19 crisis, students have suffered from depression and be negatively affected by the fear of being infected with the virus, especially dental postgraduates. Therefore, the need for counseling services and psychological help should increase following the COVID-19 pandemic.[23] Students having professional stress were 68% and 16.5% were having personal stress. Out of which 76.3% thought that Covid-19 is the reason for stress and it is more in the case of females. Women are more likely to overthink sad and anxious emotions than men whereas men are more likely to distract attention away from these emotional states.[24]

## 6. CONCLUSION

The following conclusions can be drawn from the following study:

- Prevalence of stress level is present in postgraduate dental students.
- Stress level is more common in females and postgraduates having clinical branches.
- To prevent Covid-19 infection postgraduate students are taking health supplements, immunity-boosting preparation, and various preventive measures.
- Loss of academic sessions and clinical hours is the main reason for stress among postgraduates.
- COVID-19 has severely affected dental students' life.

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**APPENDIX**

**Table 1: Postgraduates showing habits , health status, and the supplements they take.**

S.NO.	QUESTIONS	YES	NO	SOMETIMES
1	Suffering from any kind of medical ailments	9.1%	90.9%	-
2	Do you exercise daily	68.3%	31.7%	-
3	Do you take proper breakfast	64.4	9.3	24.6
4	Do you Snacks between meals	27.5%	24.2%	48.3%
5	Do you take Health supplements	27.3%	63.6%	9.1%
6	Do you Consume alcohol	5%	78.5%	16.5%
7	Do you taking Immunity boosting preparation	46.3	42.1	11.6
8	Do you take Kadha, Tulsi, chawanprash	43.8	45.5	10.7
9	Do you Wear N95 mask/PPE	77.7	10.7	11.6
10	Do you take Vit C, Vit D3, zinc supplements	45.5	39.7	14.9
11	Have you taken hydroxychloroquinone	10.7%	89.3%	-
12	Have you taken ivermectin	8.3	91.7	-
13	Do you mouthwash and gargle	30.8	45	24.2

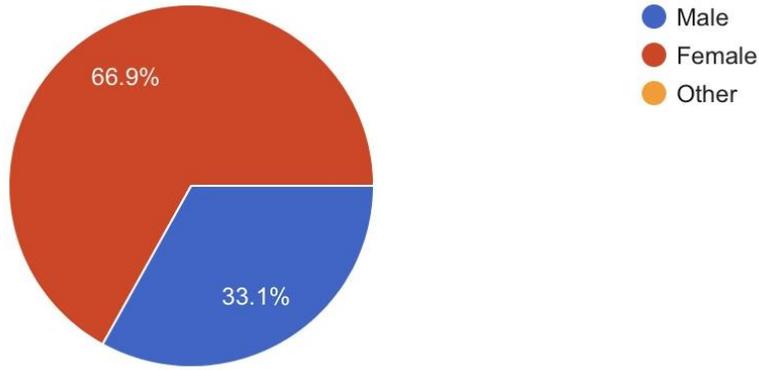
**Table 2: Postgraduates showing stress of various kind.**

S NO	QUESTIONS	YES	NO
1	Fear of aerosol generating procedure	76.9	23.1
2	Fear of loss of clinical hours	88.9	11.1
3	Fear of incompleteness of thesis	75.6	24.4
4	Fear of loss of academic hours	79.8	20.2
5	Fear of getting less number of patients	89.8%	10.2
6	Fear of getting infected from patients, staff, colleagues	84.9%	15.1
7	Fear of uncertainty about exams	69.5	30.5
8	Stress of lack of equipments / PPE/mask	64.4	35.6
9	Fear of being away from home	45.4	54.6
10	Stress of inability to visit home	42.9	57.1
11	Stress of near and dear one gets infected	94.2	5.8
12	Do you think Webinars are useful	51.3	14.3
13	Do you think clinical hours should be extended	50.8	49.2
14	Do you think academic session should be extended	14.3	73.1
15	Do you think we should practice in vitro	63	19.3
16	Do you think thesis topic Should be changed from invivo to invitro	55.2	19
17	Do you think Post Covid situation would be same as before	5.9	76.5
18	Do you have any kind of Mental stress	33.9%	34.7
19	Do you think Covid caused stress	76.3%	23.7

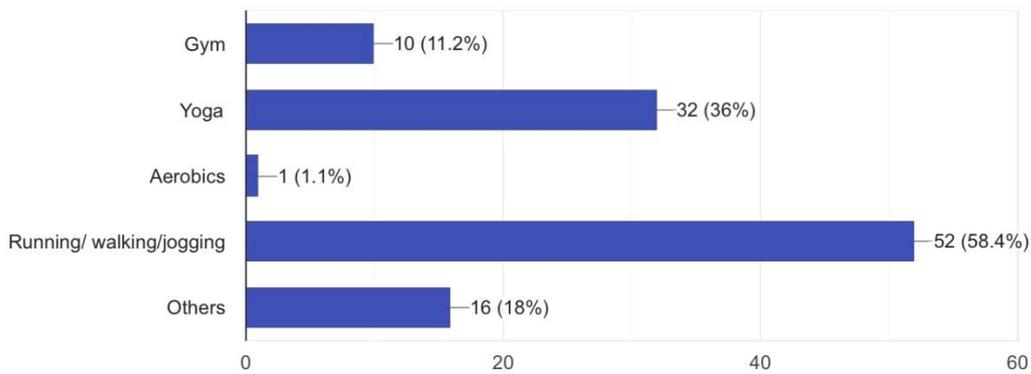
**Table 3: Statistical analysis: Mean values among different groups**

Determinants	Crude OR (95% CI)	P value	Adjusted (95% CI)	P value
Year of PG				
1 <sup>st</sup> year	1		1	
2 <sup>nd</sup> Year	1.16	0.450	.65 (0.19 to 2.20)	
3 <sup>rd</sup> year	0.65		.45 (0.11 to 1.81)	
Sex				
Female	1		1	0.833
Male	1.03 (0.47 to 2.25)	0.934	1.11 (0.39 to 3.15)	
Accommodation of student				
Far from parents	1		1	0.020
With parents	3.13 (1.23 to 7.96)	0.016	4.65 (1.26 to 17.08)	
Exercise				
No	1		1	0.220
Yes	0.47 (0.19 to 1.14)	0.096	0.53 (0.19 to 1.44)	
Deleterious habits				
Present	1		1	0.164
Absent	1.53 (0.63 to 3.69)	0.337	2.44 (.69 to 8.58)	

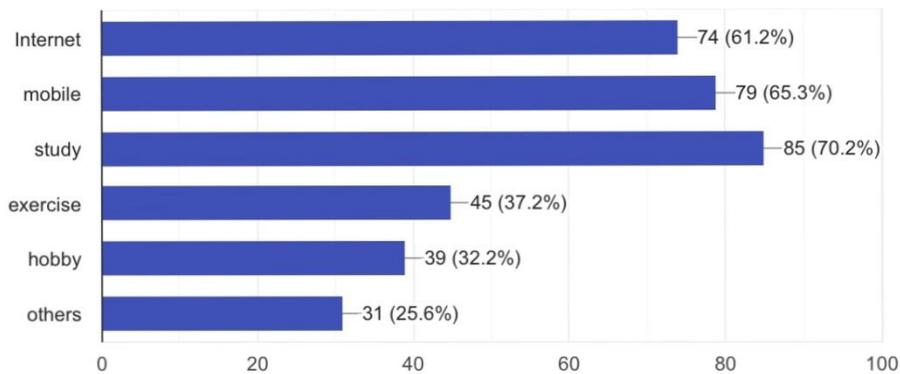
Fear of incomplete thesis	1	0.009	1	0.039
No	3.13 (1.32 to 7.43)		3.17 (1.06 to 9.49)	
Yes				



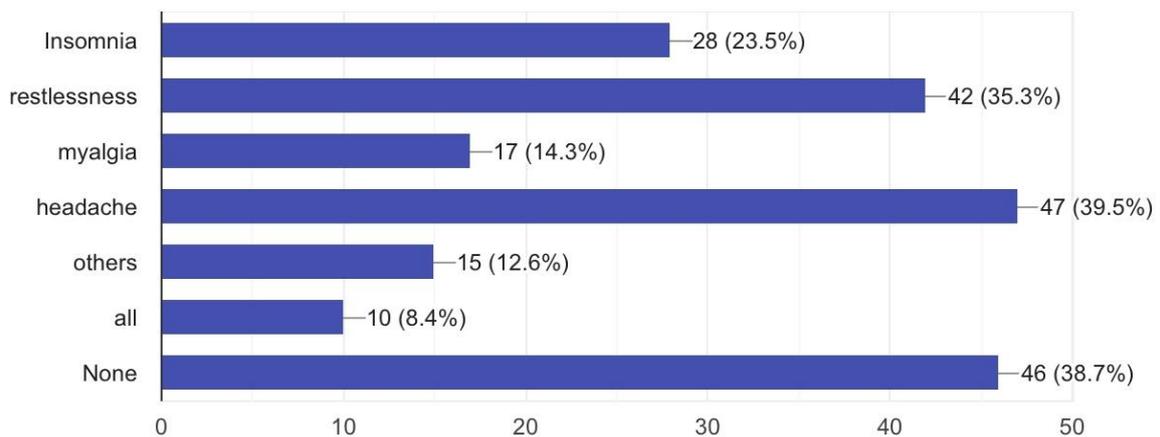
**Figure 1: Stress distribution among Indian post-graduates gender-wise**



**Figure 2: Forms of regular exercises by postgraduate students**



**Figure 3: Post-graduates students spending time on various activities during pandemic**



**Figure 4: Symptoms associated with stress among postgraduate students**

**Table 4: Descriptive statistics**

<i>Specialty/ Branch</i>	
Mean	24.4
Standard Error	11.5317918
Median	11
Mode	5
Standard Deviation	36.46672761
Sample Variance	1329.822222
Kurtosis	6.968363097
Skewness	2.582158956
Range	120
Minimum	2
Maximum	122
Sum	244
Count	10
Confidence Level (95.0%)	26.08672543

**Table 5: Frequency distribution table- Gender**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	40	32.79
Female	82	67.21
Total	122	100