

## Mental Health Status of Dentists in an Indian Metropolitan City during the Post-Lockdown Period of the Covid-19 Pandemic – A Cross-Sectional Study

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### Abstract

**Introduction** – The Covid-19 Pandemic predisposed healthcare workers including dentists to an array of mental health issues. This study was undertaken to assess this psychological impact among dentists in Bangalore during the post-lockdown period of the second wave due to COVID-19.

**Materials and methods**- The cross-sectional study was conducted in the post-lockdown period of the covid-19 pandemic through online questionnaire forms circulated among private dentists registered with the Karnataka Dental Council of India practicing in Bangalore. Multivariate binary logistic regression was employed for the statistical analysis.

**Results**- Among the 843 respondents, 83.5 %, 29.4 %, and 60% were reported to have depression, anxiety, and stress respectively. Regression analysis showed that the concerns about the safety of the dental staff in the clinic setup, that of performing aerosol-producing dental procedures, and the presence of comorbidities predisposed the dentists to these psychological conditions. Confidence in the safety offered by PPE kits used during dental procedures and performing dental procedures that did not produce aerosols had a protective impact against a propensity to these psychological problems.

**Conclusion**- The present study gives a comprehensive picture of the negative psychological impact of the second wave of the covid-19 pandemic on the mental health of dentists in India.

**Keywords**- Anxiety, Covid-19, Dentists, Depression, Stress

### Introduction

On March 11, 2020, the World Health Organization (WHO) proclaimed the new coronavirus (COVID-19) to be a pandemic.<sup>1</sup> This pandemic had put a monumental burden on healthcare systems all around the globe, and remarkable efforts were made to combat it.<sup>2</sup>

Due to uncertainty, the possibility of death, and a lack of public health preparedness, earlier experiences dealing with similar public health emergencies have demonstrated generalized public anxiety and worries. The COVID-19 epidemic resulted in similar situations of mental health crises.<sup>3</sup>

According to lessons learned from previous events, healthcare professionals always play a significant role and push themselves to the very maximum in situations like this. The recent COVID-19 outbreak presented significant difficulties for medical practitioners including dentists. As a result of this circumstance, they experienced increased anguish and trepidation. Moreover, it affected their productivity, which ultimately negatively impacted the healthcare delivery system across the globe.<sup>4</sup>

The challenges faced by dentists in providing patient care were comparable to or even greater than those faced by medical professionals because dentistry requires close contact with patients as well as the use of rotary and surgical instruments that produce a visible aerosol spray comprising droplets of water, saliva, blood, microbes, and other debris.<sup>5-6</sup>

This component must be addressed in dental health care because of the high risk of infection when performing routine and emergency dental operations, as well as the close relationship between infection risk and psychological distress. Hence, this study was undertaken to thoroughly investigate the psychological effect of this wave on Dentists to comprehend their mental health, and perceived work situation, and gauge the service's readiness as we began to adapt to living in the post-lockdown period of the crippling second wave due to COVID-19.

## **METHODOLOGY**

### **Study design**

Before the start of the study, a protocol for the intended study was submitted to the Institutional Review Board, KLE Society's Institute of Dental Sciences, Bangalore, and ethical clearance for the present study was obtained (REF/IRB/CODE-KLE/JAN 2021/10).

As most of the Indian States had started lifting these lockdown measures by the start of July 2021, there was a gradual opening of dental clinics across the country. This cross-sectional study was conducted in the time frame from 1<sup>st</sup> July to 31<sup>st</sup> July 2021 by online questionnaire forms circulated among dentists registered with the Karnataka Dental Council of India practicing in Bangalore. Using the snowball sampling technique, the link to this form was sent through e-mails, WhatsApp, and other social media to the contacts of the investigators. On clicking the link participants got auto-directed to the contents of the study and the informed consent. The dentists who did not consent to the study or those who were not practicing in this time frame were excluded from the study.

### **Instruments**

The survey questionnaire comprised three sections. The first section consisted of questions about socio-demographic data inclusive of age, sex, area (urban/rural) of the dental practice, and general health status. In the second section, a prevalidated closed-ended questionnaire was used to gather information on dental procedures, as well as on the factors affecting the risk of contracting COVID-19 in a clinical set-up. These dental procedures were divided into aerosol-producing dental procedures (using dental air rotors and ultrasonic scalers) and non-aerosol therapeutic dental procedures (mostly using dental hand instruments, impression trays, and forceps). This questionnaire was validated with a face validity of 90 % and a content validity ratio of 0.83 as reviewed by six experts and a Cronbach alpha value of 0.92 demonstrating excellent internal consistency.

The final component comprised the Depression, Anxiety, and Stress Scale - 21 Items (DASS-21). The DASS-21 consists of three sets of seven items, each of which is associated with depression, anxiety, and stress. The four response possibilities were: did not apply to me at all, applied to me to some extent, applied to me significantly, and did not apply to me at all. By combining the scores for the relevant items, the findings were classified as normal, mild, moderate, severe, or extremely severe.<sup>7,8</sup>

During pilot testing, it was discovered that each form took roughly 3 minutes to complete the forms. Finally, only the e-forms with complete responses were evaluated. Confidentiality and anonymity were ensured throughout the data collection process.

### **Statistical analysis**

For statistical analysis, IBM Corp., Armonk, New York, USA's SPSS version 26 was utilized. Data obtained from the first two sections of the forms were identified as independent variables. Stress, anxiety, and depression were the outcome variables. To perform the binary regression analysis, the outcome variable was defined as the presence or absence of either of the psychological condition. For this, subjects with mild to severe types of

depression, anxiety, and stress were grouped into the category of the presence of depression, anxiety, and stress respectively. Statistical significance was defined as a p-value less than 0.05.

## RESULTS

The sample had a mean age of  $36.76 \pm 10.21$  years. As seen in Table 1, among the 843 study participants, the majority were females. Most of the participating dentists were practicing in an urban set-up. Regarding the health status of the population, more than 60 % were free from any comorbidities while some were suffering from diabetes, hypertension, and asthma. Figure 1 shows that among the respondents, more than 60% of the dentists had stress. More than three-quarters of the respondents were inflicted with anxiety, while more than 80% were depressed.

### Depression

The binary logistic regression in Table 2 showed that those dentists who were healthy and free of any comorbidities were less likely to be depressed as opposed to those with any comorbid conditions. Performing diagnostic procedures such as clinical examinations, taking radiographs, and performing non-aerosol-generating procedures were less likely of concern to the dentists in predisposition to depression, while conducting aerosol-generating procedures during the pandemic on patients as a concern had greater odds of succumbing to depression. Those who were concerned about the safety of the practice's clinical and non-clinical employees were eight times more likely to develop depression than those who were not.

### Anxiety

According to the regression analysis in Table 3, dentists who had no comorbid disorders were less likely to experience anxiety than those who did. Those who practiced in an urban setting were more likely to feel anxious than those who practiced in a rural setting. In contrast to concerns about performing aerosol-generating procedures on patients, concerns about performing diagnostic procedures such as clinical examinations, taking radiographs, and performing non-aerosol-generating procedures were less likely to cause anxiety in the dentist. Those that had confidence in the PPE (personal protective equipment) kits had less likelihood of predisposition to anxiety as opposed to those that lacked confidence in the same.

### Stress

The regression analysis in Table 4 showed that female dentists were more likely to be predisposed to stress as opposed to their male counterparts. It also showed that those who were free of any comorbidities were less likely to develop stress as opposed to those with any comorbid conditions. The results of the binary logistic regression showed that the dentist's predisposition to stress was less likely to be an issue when performing diagnostic procedures like clinical examinations and taking radiographs than when performing aerosol-generating procedures. Compared to those who lacked faith in the PPE kits, those who did so were less likely to be predisposed to stress. Those with concerns about the safety of their staff had greater odds of stress.

## DISCUSSIONS

During these stressful and uncertain times, our findings revealed a significant frequency of psychological conditions such as depression, anxiety, and stress among practicing dentists in the Indian metropolis of Bangalore. Over half of the dentists in a similar study done in the United Kingdom claimed that the epidemic had had a detrimental influence on their mental health.<sup>9</sup>

Among the socio-demographic variables, it was found that female dentists were more likely to succumb to stress during this pandemic as opposed to their male counterparts. In a related study by Lai et al., women who work in healthcare were found to be more susceptible to depression and stress.<sup>10</sup> In our study, stress was associated with having a clinic in an urban setting during the pandemic. This was contrary to the results obtained in a similar study where living in a rural area was an independent risk factor for insomnia and stress in medical Healthcare workers.<sup>11</sup>

Dentists with comorbidities displayed greater odds of succumbing to depression, anxiety, and stress. It was seen that subjects with comorbidities such as hypertension, obesity, chronic lung disease, diabetes, and cardiovascular disease had the worst prognosis if infected with covid-19 and are more likely to develop deteriorating outcomes like ARDS and pneumonia. The awareness of the same may have been the underlying cause of this association.<sup>12</sup>

Our study revealed that the concerns of performing aerosol-producing procedures amounted to depression, anxiety, and stress among the dentists practicing in the post-lockdown period of the second wave while that of conducting non-aerosol therapeutic procedures such as working with hand instruments as well as doing oral

examinations and taking radiographs were associated with lower odds of predisposition to depression, and anxiety. Concerns about the safety of clinical staff and para-clinical staff in a clinical setting during the post-lockdown period of the second wave were significantly associated with depression and stress. The reasons for these associations may be due to the higher risks of transmissions involved with these procedures that produce aerosols in dental settings as illustrated earlier. Confidence in the PPE kits had a protective effect against anxiety and stress. This finding was echoed in other studies that also found PPE kits to be a protective factor when adequate and a risk factor for poor mental health outcomes when deemed to be inadequate among healthcare workers.<sup>13,14</sup> This can be due to the ability of these protective gears to deter the transmission of the aerosols containing the covid-19 virus while performing dental procedures.

## CONCLUSION

This study gives useful implications for psychological health during an epidemiological crisis and supports the prevalence of severe anguish experienced by Indian dentists during COVID-19. During these trying times, dentists were striving for protecting their patients' interests while risking infection and struggling with financial burdens that took a toll on their psychological well-being. Should a similar pandemic occur again, these findings would be crucial in developing particular screening procedures for mental health disorders among dental healthcare workers to improve patient care and service delivery.

## Limitations

Due to the cross-sectional nature of the study, causality is subject to inherent constraints. The smaller sample size may have some impact on the statistical power, however, it may be noted that relatively few dental practitioners had opened their practice in this time frame of the pandemic. Since the sample was composed of dentists in the south Indian city of Bangalore, generalizability to other locations in India must be reckoned with caution. Further multi-centric research along these lines utilizing a more longitudinal approach would allow more insight into the causality, and consolidate the generalizability and representativeness of the results.

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## References:

1. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Bio Medica: Atenei Parmensis*. 2020; 91(1):157.
2. Nicola M, Alsaifi Z, Sohrabi C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): a review. *Int J Surg*. 2020; 78:185.
3. Stangvaltaite-Mouhat L, Uhlen M-M, Skudutyte-Rysstad R, Szyszko Hovden EA, Shabestari M, Ansteinsson VE. Dental health services response to COVID-19 in Norway. *Int J Environ Res Public Health*. 2020; 17(16):5843.
4. Chatterjee SS, Bhattacharyya R, Bhattacharyya S, Gupta S, Das S, Banerjee BB. Attitude, Practice, behavior, and mental health impact of COVID-19 on doctors. *Indian Journal of Psychiatry*. 2020 May; 62(3):257.
5. Chaudhary FA, Ahmad B, Ahmad P, Khalid MD, Butt DQ, Khan SQ. Concerns, perceived impact and preparedness of oral healthcare workers in their working environment during COVID-19 pandemic. *Journal of occupational health*. 2020; 62(1):e12168.
6. 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(1):9.
7. Samani S, Joukar B. A study on the reliability and validity of the short form of the depression stress stress scale (DASS-21).
8. Shinkre R, Srivastava BK, Eshwar S, Jain VK. *International Journal of Scientific Research*.
9. Collin V, O' Selmo E, Whitehead P. Psychological distress and the perceived impact of the COVID-19 pandemic on UK dentists during a national lockdown. *British Dental Journal*. 2021Jan; 22:1-8.
10. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, Tan H. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open*. 2020 Mar 2; 3(3):e203976-.

11. Zhang W, Wang K, Yin L, Zhao W, Xue Q, Peng M, et al. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother Psychosom.* 2020; 89(4):1–9.
12. Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P, Hosein Z, Padda I, Mangat J, Altaf M. Comorbidity and its impact on patients with COVID-19. *SN comprehensive clinical medicine.* 2020 Aug;2:1069-76.
13. 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 (COVID-19) in Hubei, China. *Med Sci Monit.* 2020; 26:e924171.
14. Yin X, Zeng L. A study on the psychological needs of nurses caring patients with coronavirus disease 2019 from the perspective of the existence, relatedness, and growth theory. *Int J Nurs Sci.* 2020; 7(2):157–60.

**Tables**

**Table 1: Sociodemographic details of study participants: (N=843)**

Sociodemographic details		Frequency (N=843)	%
Sex	Males	364	43.2
	Females	479	56.8
Area of practice	Urban	604	71.6
	Rural	239	28.4
General Health	None	527	62.5
	Diabetes Mellitus	41	4.9
	Hypertension	194	23.0
	Asthma	17	2.0
	Immunosuppression	3	.4
	DM + HTN	54	6.4
	HTN + Asthma	7	.8

**Table 2 – Association of Depression with factors affecting Dentists’ background characteristics, perceived work situation, and service readiness in the post-lockdown phase of the Second wave**

Independent variables	B	S.E	Wald	p-value	Odds ratio	95 % CI	
						Lower	Upper
Age	-.53	.34	2.38	.12	.58	.29	1.15
Sex (Ref: Females)	-.01	.25	.00	.97	.99	.60	1.63
Practicing area (Ref: rural)	.32	.28	1.29	.25	1.38	.79	2.41
General Health (Ref: without any comorbid health condition)	.48	.11	16.44	<b>.00*</b>	1.61	1.28	2.04
Intra-oral Clinical examination	-1.24	.39	10.17	<b>.00*</b>	.28	.13	.61
Taking Radiographs	-1.77	.40	19.63	<b>.00*</b>	.16	.07	.37
Aerosol-generating dental therapeutic	1.18	.51	5.34	<b>.02*</b>	3.26	1.19	8.89
Non-Aerosol-generating therapeutic dental	-1.08	.44	6.06	<b>.01*</b>	.33	.14	.80
Rising number of covid-19 cases in the post-lockdown period	.69	.51	1.81	.17	2.00	.72	5.52
Safety of the clinical and non-clinical staff at your practice	2.16	.67	10.41	<b>.00*</b>	8.67	2.33	32.23
Investment in the clinical setup for covid 19 management	-.32	.36	.81	.36	.72	.35	1.46
Difficulty in management of clinic expenditures	-.38	.40	.91	.33	.68	.30	1.50
Risk of cross-infection in the clinic	.16	.33	.23	.62	1.18	.60	2.28
Treatment of asymptomatic carriers of COVID-19	-.02	.39	.00	.94	.97	.44	2.11
Confidence in the safety offered by the PPE kit against covid-19	.09	.27	.12	.71	1.10	.64	1.87

**\*p value < 0.05 statistically significant**

**Table 3 – Association of Anxiety with factors affecting Dentists’ background characteristics, perceived work situation, and service readiness in the post-lockdown phase of the Second wave**

Independent variables	B	S.E	Wald	p-value	Odds ratio	95 % CI	
						Lower	Upper
Age	.31	.348	.79	.37	1.36	.69	2.69
Sex (Ref: Females)	.21	.212	1.00	.31	1.23	.81	1.87
Practicing area (Ref: rural)	.54	.235	5.432	<b>.02*</b>	1.72	1.09	2.73
General Health (Ref: without any comorbid health condition)	.7	.109	42.68	<b>.00*</b>	2.03	1.64	2.51
Intra-oral Clinical examination	-1.09	.30	12.59	<b>.00*</b>	.33	.18	.61
Taking Radiographs	-.53	.28	3.68	<b>.05*</b>	.58	.33	1.01
Non-Aerosol-generating dental therapeutic	-.80	.35	5.08	<b>.02*</b>	.44	.22	.90
Aerosol-generating therapeutic dental	1.15	.46	6.12	<b>.01*</b>	3.18	1.27	7.95

Rising number of covid-19 cases in the post-lockdown period	-.34	.39	.77	.37	.70	.32	1.52
Safety of the clinical and non-clinical staff at your practice	.67	.48	1.94	.16	1.97	.75	5.12
Investment in the clinical setup for covid 19 management	.23	.337	.47	.48	1.26	.65	2.44
Difficulty in management of clinic expenditures	-.39	.38	1.08	.29	.67	.31	1.42
Risk of cross-infection in the clinic	-.22	.21	1.08	.29	.79	.52	1.22
Treatment of asymptomatic carriers of COVID-19	-.19	.34	.33	.56	.82	.42	1.60
Confidence in the safety offered by the PPE kit against covid-19	-1.09	.38	8.21	.00*	.33	.15	.70

\*p value < 0.05 statistically significant

**Table 4** – Association of Stress with factors affecting Dentists’ background characteristics, perceived work situation, and service readiness in the post-lockdown phase of the Second wave

Independent Variables	B	S.E	Wald	p-value	Odds ratio	95 % CI	
						Lower	Upper
Age	-.47	.35	1.76	.18	.62	.31	1.25
Sex (Ref: Females)	-.36	.18	3.88	.04*	.69	.48	.99
Practicing area (Ref: rural)	.31	.20	2.47	.11	1.37	.92	2.04
General Health (Ref: without any comorbid health condition)	.34	.07	23.42	.00*	1.40	1.22	1.61
Intra-oral Clinical examination	-1.32	.42	9.62	.00*	.26	.11	.61
Taking Radiographs	-.61	.26	5.26	.02*	.54	.32	.91
Non-Aerosol-generating dental therapeutic	-.09	.29	.10	.74	.91	.51	1.61
Aerosol-generating therapeutic dental	.92	.43	4.51	.03*	2.52	1.07	5.91
Rising number of covid-19 cases in the post-lockdown period	-.29	.27	1.15	.28	.74	.43	1.27
Safety of the clinical and non-clinical staff at your practice	1.31	.48	7.46	.01*	3.73	1.45	9.60
Investment in the clinical setup for covid 19 management	.01	.31	.00	.95	1.01	.54	1.89
Difficulty in management of clinic expenditures	-.18	.38	.22	.63	.83	.39	1.76
Risk of cross-infection in the clinic	-.11	.19	.35	.55	.89	.60	1.30
Treatment of asymptomatic carriers of COVID-19	-.04	.35	.01	.91	.96	.47	1.93
Confidence in the safety offered by the PPE kit against covid-19	-1.92	.42	20.22	.00*	.14	.06	.33

\*p value < 0.05 statistically significant

**Figure 1: Distribution of psychological variables among the study participants: (N=843)**

