

Evaluation of Burnout among Medical Officers and Dental Surgeons in State Health Services using Maslach's Burnout Inventory during COVID-19: A Cross Sectional Study

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ABSTRACT

Introduction: The Coronavirus disease 2019 (COVID-19) pandemic became a worldwide public health crisis. It leads to raised levels of burnout and anxiety among the people of the medical and dental fraternity, especially those involved in various duties related to COVID-19. The present research focused on evaluating the prevalence and predictors of burnout among medical officers and dental surgeons in Haryana's state dental health services. **Materials and Methods:** A cross-sectional study was conducted to assess burnout among medical officers and dental surgeons involved in COVID-19-related duties in state health services. Maslach's burnout scale was used to evaluate burnout. It is a prevalidated and self-administered questionnaire with three domains, that is, emotional exhaustion (EE), personal accomplishment (PA) assessment, and depersonalization (DP). The Chi square test, Student's *t* test (unpaired), and analysis of variance (ANOVA) with *post hoc* analysis were done wherever applicable. Pearson's correlation analysis was used to check the relationship among EE, DP, and PA. **Results:** A total of 200 study participants responded to the online survey. Nearly half of them (51%) were aged 25–34 years. The majority had service experience of up to 20 years (90%). Almost three-fourths (72%) of study participants performed duties for >8h a day. Up to 86% reported that the second wave of COVID-19 caused increased burnout. Moderate-to-high degrees of occupational exhaustion (OE) and DP were reported among approximately 42% of study participants. Medical officers were reported to have statistically significantly higher levels of burnout compared to dental surgeons ($P < 0.05$). **Conclusion:** Moderate levels of burnout were reported among half of the study participants, suggestive of the need to address the issues related to mental health of healthcare providers.

KEYWORDS: *Burnout, COVID-19, dental surgeons, Maslach burnout inventory, medical officers, mental health*

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INTRODUCTION

Since its onset in December 2019, Coronavirus disease 2019 (COVID-19) has become an international public health issue. The distress it caused was not limited to the disease itself; however, there were higher levels of stress and burnout among healthcare professionals worldwide while performing their daily work, which was related to

risk of infection, social isolation, exhaustion, and being away from their families.^[1] A common syndrome among

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people in professions such as healthcare is burnout, which is typified by cynicism and emotional exhaustion (EE). Among the important factors are elevated sensations of EE. Developing pessimistic, cynical attitudes and feelings toward other people is another factor (depersonalization [DP]). The third factor is the propensity to have low self-esteem, especially when it comes to one's job (personal accomplishment [PA]).^[2] According to a study on the causal association among burnout, job strain, and depression among Finnish dentists, the "path from burnout to depression appears to be stronger than the path from depression to burnout." This suggests that more research is needed to accurately assess burnout.^[3] Most of the studies have assessed burnout among medical or dental students and private practitioners.^[4,5] None of the studies have reported it among health professionals in state health services.

Haryana is a state in India with a very good healthcare infrastructure. It includes around 57 hospitals, 2630 subcenters, 485 primary health centers, and 112 community health centers, with a total of 4664 medical officers and 663 dental surgeons posted at various facilities.^[6] In the challenging times of COVID-19, both medical officers and dental surgeons in Haryana Civil Medical Services were given duties related to administrative work, patient care, sampling, contact tracing, and vaccination.^[6] Still, the system was overwhelmed due to growing number of COVID-19 patients, and this might have triggered the elements of psychological trauma. The COVID-19 impact, together with uncertainties on the mental health and well-being of healthcare professionals in such settings, remains unclear. Hence, the current research has been performed with the goal to calculate the level of burnout among medical and dental professionals associated with the government health services system during the COVID-19 pandemic, and also to assess the risk factors associated with the levels of burnout.

MATERIALS AND METHODS

SETTING AND DESIGN

A cross-sectional research has been performed among medical officers and dental surgeons in Haryana, India during the period from June to August 2022. A Google survey form was developed, and the link was generated. The link was then shared with the study participants through email and various social media platforms.

ETHICAL APPROVAL AND INFORMED CONSENT

The institutional review board granted ethical clearance (PGIDS/BHRC/24/06). On the first page of the questionnaire were the statements regarding anonymity declaration, voluntary nature

of participation, and an explanation of informed consent. The reporting of the study was made in accordance with the strengthening the reporting of observational studies guidelines.

SAMPLING AND SAMPLE SIZE ESTIMATION

The sample size has been computed through Master Software Version 2, based on the proportion of one group through hypothesis testing of a single proportion with 80% power and a 5% error in a two-sided test. Readability and comprehension of the questionnaire were assessed during a pilot study performed among 60 study participants. The sample size was determined as 194 with a 40% sample proportion through a pilot study. It was rounded off to 200. Study participants were selected randomly from the list of medical officers and dental surgeons in Haryana.^[6] The link was shared with the study participants till the required number responded.

STUDY TOOL

This research adopted the original 22-item version of Maslach's burnout inventory (MBI) and Cronbach's alpha coefficients, which were 0.80, 0.83, and 0.85 for EE, DP, and PA, respectively. A structured proforma was prepared, which included demographic details and prevalidated MBI^[7] for determining burnout among the study population. MBI is a 22-item instrument with seven response options ranging from 0–6 for each item.

It included three domains as follows:

1. Emotional exhaustion (EE)—Relationship with work that is perceived as tiring, difficult, or stressful. It has nine items with scores ranging from 0 to 54. Where a score of < 17 is a low degree, 18–29 is a moderate degree, and > 30 is a high degree of OE.
2. DP/loss of empathy—Loss of empathy toward others (colleagues, clients, etc.) and increased emotional detachment, demonstrated by cynical, derogatory remarks, and even callousness. There are five items total, and the scores ranging from 0 to 30. A score of less than 5 shows a lower degree of DP, a score of 6 to 11 shows a moderate degree, and a score of >12 indicates a high degree.
3. PA assessment—A feeling that, in the event of OE and DP, serves as a "safety valve" and helps restore equilibrium. It guarantees contentment and a favorable perception of one's career accomplishments. There are eight items on it, and the scores range from 0 to 48. A score of < 33 depicts a low level of PA, 34–39 a moderate degree, and > 40 a high degree.

The data was analyzed using Version 22 of the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA). There were both descriptive and inferential statistics run. When appropriate, the Chi square test, the Student's *t* test (unpaired), and analysis of variance (ANOVA) with *post hoc* analysis were carried out. To determine whether the burnout domains were correlated, Pearson's correlation analysis was carried out. A 95% confidence interval with a *P* value < 0.05 was generally considered statistically significant.

RESULTS

The present study involved 200 study participants, and the majority (74%) of them were dental surgeons. Figure 1 represents the proportion of study participants with domain-wise risk levels of burnout. The majority of study participants aged 25–45 years (85%). Around 60% were males. Almost 50% of the study participants had service experience

of <10 years, while around 40% had 10–20 years of service experience. It was reported that 73% of them were working for >8 h a day during the COVID-19 pandemic [Table 1].

A statistically significant difference was observed among study participants regarding levels of EE with respect to age, occupation, service experience, and number of duty hours [Table 2]. Levels of DP were found to be statistically significantly different among study participants with respect to age, gender, occupation, service experience, and COVID-19 wave [Table 3]. Whereas PA assessment was statistically significant with respect to age and gender [Table 4].

Regarding the mean distribution of domains, there was an age-wise statistically significant difference among the groups with respect to EE, DP, and PA. *Post hoc* analysis showed a significant difference between the age groups 25–34 and > 45 years for EE, also between 25–34 and 35–45, 25–34 and > 45 years for DP and PA

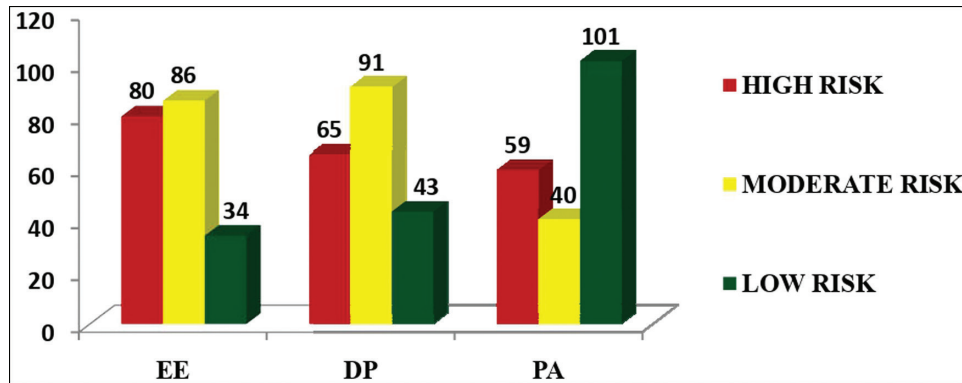


Figure 1: Domain-wise levels of burnout among study participants (proportion). EE= E

Table 1: Distribution of study participants by sociodemographic characteristics

Sociodemographic variables		N (%)	Total
Age (years)	25-34	70 (34.8)	200 (100%)
	35-45	102 (50.7)	
	>45	28 (13.9)	
Gender	Male	120 (59.7)	200 (100%)
	Female	80 (39.8)	
Occupation	Medical officer	52 (25.9)	200 (100%)
	Dental surgeons	148 (73.6)	
Service experience (years)	<10	97 (48.3)	200 (100%)
	10–20	83 (41.3)	
	>20	20 (10.0)	
Duty hours	≤8	54 (26.9)	200 (100%)
	>8	146 (72.6)	
COVID wave	First	19 (9.5)	200 (100%)
	Second	172 (85.6)	
	Third	9 (4.5)	

Table 2: Distribution of emotional exhaustion (EE) according to risk factors

Sociodemographic variables		EE < 17 N (%)	EE 18–29 N (%)	EE > 30 N (%)	P value
Age (years)	25–34	35 (17.5)	27 (13.5)	8 (4.0)	0.001*
	35–45	39 (19.5)	49 (24.5)	14 (7.0)	
	>45	6 (3.0)	10 (5.0)	12 (6.0)	
Gender	Male	41 (20.5)	54 (27.0)	25 (12.5)	0.36
	Female	39 (19.5)	32 (16.0)	9 (4.5)	
Occupation	Medical officer	9 (4.5)	23 (11.5)	20 (10.0)	<0.001*
	Dental surgeons	71 (35.5)	63 (31.5)	14(7.0)	
Service experience (years)	<10	50 (25.0)	37(18.5)	10 (5.0)	0.014*
	10–20	24 (12.0)	39(19.5)	20(10.0)	
	>20	6(3.0)	10 (5.0)	4 (2.0)	
Duty hours	≤8	31 (15.5)	18 (9.0)	5 (2.5)	0.007*
	>8	49 (24.5)	68 (34.0)	29 (14.5)	
COVID wave	First	8 (4.0)	9 (4.5)	2 (1.0)	0.24
	Second	70 (35.0)	74 37.0)	28 (14.0)	
	Third	2 (1.0)	3 (1.5)	4 (2.0)	

Chi square test, sig. 2 tailed, $P < 0.05^*$

Table 3: Distribution of depersonalization/loss of empathy (DP) according to risk factors

Sociodemographic variables		DP < 17 N (%)	DP 18–29 N (%)	DP > 30 N (%)	P value
Age (years)	25–34	27 (13.5)	29 (14.5)	14 (7.0)	0.005*
	35–45	37 (18.5)	46 (23.0)	19 (9.5)	
	>45	1 (0.5)	16 (8.0)	10 (5.0)	
Gender	Male	27 (13.5)	63 (21.5)	30 (15.0)	0.001*
	Female	38 (19.0)	28 (14.0)	13 (6.5)	
Occupation	Medical officer	10 (5.0)	24 (12.0)	17 (8.5)	0.01*
	Dental surgeons	55 (27.5)	67 (33.5)	26 (13.0)	
Service experience (years)	<10	40 (20.0)	39 (19.5)	18 (9.0)	0.004*
	10–20	24 (12.0)	40 (20.0)	19 (9.5)	
	>20	1 (0.5)	12 6.0)	6 (3.0)	
Duty hours	≤8	20 (10.0)	23 (11.5)	10 (5.0)	0.31
	>8	45 (22.5)	68 (34.0)	33 (16.5)	
COVID wave	First	11 (5.5)	3 (1.5)	5 (2.5)	0.02*
	Second	52(26.0)	85 (42.5)	34 (17.0)	
	Third	2 (1.0)	3 (1.5)	4 (2.0)	

Chi square test, sig. two-tailed, $P < 0.05^*$

(two-way ANOVA with *post hoc*). There were significant mean variations among gender groups for DP and PA (unpaired Student’s “*t*” test). Similarly, significant mean differences were observed among medical officers and dental surgeons for all three domains, with medical officers showing higher overall levels of burnout compared to dental surgeons. Regarding service experience, EE and PA showed statistically significant differences between those with <10 and >20 years of experience. The mean differences among duty hours were found to be significantly significant in EE and PA. Mean DP and PA were found to be statistically significantly different among the groups for the COVID-19 waves, whereas EE varied significantly

between the second and third waves, DP levels between the first and third waves, and PA levels between the second and third waves [Table 5].

Both EE and DP showed a moderate but statistically significant positive correlation ($r = 0.39$, $P < 0.001$). Whereas both were negatively correlated to PA [Table 6].

DISCUSSION

One of the immediate effects of the pandemic on medical professionals is burnout. It is the outcome of extended engagement in emotionally difficult work environments. Burnout in healthcare settings can affect patient care and the quality of services

Table 4: Distribution of personal accomplishment (PA) assessment according to risk factors

Sociodemographic variables		PA < 17 N (%)	PA 18–29 N (%)	PA > 30 N (%)	P value
Age (years)	25–34	48 (24.0)	13 (6.5)	9 (4.5)	<0.001*
	35–45	47 (23.5)	19 (9.5)	36 (18.0)	
	>45	6 (3.0)	8 (4.0)	14 (7.0)	
Gender	Male	47 (23.5)	31 (15.5)	42 (21.0)	<0.001*
	Female	54 (27.0)	9 (4.5)	17 (8.5)	
Occupation	Medical officer	22 (11.0)	12 (6.0)	18 (9.0)	0.39
	Dental surgeons	79 (39.5)	28 (14.0)	41 (20.5)	
Service experience (years)	<10	60 (30.0)	13 (6.5)	24 (12.0)	–
	10–20	35 (17.5)	27 (13.5)	21 (10.5)	
	>20	6 (3.0)	0 (0)	14 (7.0)	
Duty hours	≤8	31 (15.5)	8 (4.0)	15 (7.5)	0.41
	>8	70 (35.0)	32 (16.0)	44 (22.0)	
COVID wave	First	6 (3.0)	9 (4.5)	4 (2.0)	–
	Second	95 (47.5)	27 (13.5)	50 (25.0)	
	Third	0 (0)	4 (2.0)	5 (2.5)	

Chi square test, sig. two-tailed, $P < 0.05^*$

Table 5: Mean distribution of domains of occupational burnout among study participants

Sociodemographic variables		Occupational exhaustion (Mean ± SD)	Depersonalization (Mean ± SD)	Personal accomplishment assessment (Mean ± SD)
Age (years) ^{a,b,c}	25–34	18.26 ± 8.60 [‡]	7.47 ± 3.87 ^{*‡}	26.63 ± 10.45 ^{*‡}
	35–45	19.84 ± 7.94	7.55 ± 4.13	34.75 ± 8.63 [†]
	>45	23.71 ± 9.30	10.93 ± 3.99	38.64 ± 8.54
Gender ^{b,c}	Male	20.68 ± 8.65	8.84 ± 4.12	34.86 ± 8.87
	Female	18.55 ± 8.17	6.72 ± 3.96	28.84 ± 11.21
Occupation ^{a,b,c}	Medical officer	24.27 ± 8.80	9.83 ± 4.53	35.42 ± 9.42
	Dental surgeons	18.27 ± 7.85	7.35 ± 3.85	31.41 ± 10.39
Service experience (years) ^{a,c}	<10	18.02 ± 8.63 [*]	7.38 ± 3.93	29.25 ± 10.80 ^{*‡}
	10–20	21.69 ± 7.83	8.35 ± 4.56 [†]	34.35 ± 8.24 [†]
	>20	20.60 ± 9.29	9.50 ± 3.17	40.10 ± 9.70
Duty hours ^{a,c}	≤8	17.13 ± 7.04	7.39 ± 3.73	30.11 ± 12.79
	>8	20.83 ± 8.80	8.22 ± 4.32	33.32 ± 9.07
COVID wave ^{b,c}	First	20.42 ± 9.74	6.68 ± 4.55 [‡]	32.53 ± 7.84
	Second	19.47 ± 8.33 [†]	7.98 ± 3.90	32.02 ± 10.58 [†]
	Third	25.44 ± 8.11	10.89 ± 6.99	40.56 ± 4.10

^aStatistical significance between the groups wrt EE

^bStatistical significance between the groups wrt DP

^cStatistical significance between the groups wrt PA

^{*}Statistical significance between first and second group ($P < 0.05$)

[†]Statistical significance between second and third group ($P < 0.05$)

[‡]Statistical significance between first and third group ($P < 0.05$)

in the long term. The present study is an attempt to acknowledge the problem and make appropriate suggestions. Various studies have assessed burnout in different populations, that is, health professionals,^[8] dental professionals,^[9–11] general practitioners,^[2] dental students,^[12,13] medical students,^[14] academic^[15,16] and nonacademic dental staff,^[2] and oral health care providers,^[17] mostly before the COVID-19 pandemic. The present study is one of the very few studies^[5,18,19]

conducted among health professionals in state health services who performed all kinds of duties during COVID-19.

In the present research, majority of study participants were dental surgeons aged 25–45 years. Most of them had service experience of around 10 years. The majority of them performed duties such as sampling, contact tracing, vaccination, and reporting, apart

Table 6: Correlation between domains of occupational burnout

Domains	EE <i>r</i> (<i>p</i>)	DP <i>r</i> (<i>p</i>)	PA <i>r</i> (<i>p</i>)
EE	1	0.39 (<0.001)	-0.10 (0.15)
DP	0.39 (<0.001)	1	-0.19 (0.007)
PA	-0.10 (0.15)	-0.19 (0.007)	1

Pearson's correlation, *r* = coefficient of correlation, *P* value sig. at <0.05

EE= emotional exhaustion, DP = depersonalization, and PA = personal accomplishment assessment

from administrative and management responsibilities related to the care of COVID-19 patients. At the time of the second wave, higher burnout was reported compared to other waves. Moderate-to-high levels of EE and DP were found among more than half of the study participants, whereas PA assessment scores were satisfactory among the same. The outcomes have been similar to research conducted among dentists in Turkey who were involved in filiation services, that is, contact tracing and isolation.^[5]

In the present study, higher levels of burnout were reported among those working for more hours, which was due to an increased workload during the COVID-19 pandemic. Various work environments, healthcare systems, social support, and policies pertaining to occupational safety supervision may be the cause of these results.^[8,20] Most of the study participants were working more than 8h a day during the pandemic, that is, more than their usual working time, which, according to a previous study, increased the risk for burnout anxiety along with loneliness. However, the same study found that the number of working days/week had a positive impact on study participants' PA.^[20]

It is possible that PA has served as a coping mechanism and helped deal with burnout. This relationship is reflected by the significant positive correlation between EE and DP, while both domains were negatively correlated to PA. These findings were the same as research by Brake *et al.*^[11]

In the present study, higher age showed higher levels of burnout, but it also showed higher PA assessment scores, which might be due to the fact that professionals in higher age groups are more content with their achievements and have better coping mechanisms, which also might be related to their service experience and understanding of the system [6,7]. This is in line with research conducted among dental academic staff in Arab countries.^[15] However, some of the previous studies suggested that burnout decreases among older people.^[15,21] In the case of dental students, one of the previous studies has reported that the younger age group felt more burnout compared to the older one.^[12] There has been some variation in the level of burnout

by age and years of work practice. Slabsienke *et al.* reported that younger dentists (up to 40 years) had notably greater mean DP as compared to older ones, similar to the present study.^[20]

In addition, males showed higher mean EE, DP, and PA scores compared to females. It was reported that this difference might be due to shorter working hours of females compared to males and suggested the main reason reported was child care, especially during the pandemic.^[9,22] This was similar to the findings of a systematic review conducted before the COVID-19 pandemic,^[3] whereas others reported a higher level of burnout among females.^[20,23,24]

A current study reported that medical officers, though less observed to have significantly greater mean scores of EE, DP, and PA, which can be attributed to the fact that they were more closely involved with the care of COVID-19 patients compared to dental surgeons, whereas the later performed more duties related to screening, vaccination, and isolation. Also, those working for >8h a day showed higher mean levels of EE, DP, and PA. Similar findings were reported in a previous study conducted among health professionals.^[8,18,19] Serrao C *et al.* reported that resilience has played a key role in modifying the effect of depression on burnout among those who were involved in emergency services.^[19]

The results showed that study participants with higher service experience felt more burned out compared to those with less service experience, but they also had higher PA scores. Higher mean levels of EE were found among those with service experience of 10–20 years, whereas mean DP and PA were higher among those with >20 years of experience. This might be due to the fact that study participants with more experience understood the system better and developed a coping mechanism, which is reflected by higher PA scores.^[9] In a few studies, more burnout was reported among study participants with lesser experience, but they were conducted before the COVID-19 era.^[8,25] It was reported that due to a shortage of healthcare staff, people with less experience had to deal with the requirements of COVID-19 patients, which might have resulted in more burnout among those with less experience. Overall,

higher mean scores of EE, DP, and PA were observed during the third wave, which might be due to the cumulative effect of the constant workload that started with the onset of the first wave.

STRENGTHS AND LIMITATIONS

During the COVID-19 pandemic, numerous international studies examining the psychological effects on healthcare professionals were released. The present study is one of the very few to measure burnout levels among a specific population. We utilized a reliable and validated tool to calculate the level of burnout (i.e., MBI). However, the research has certain limitations. The first drawback is the cross-sectional design, as the longitudinal design will be much more preferable for further correlation confirmation. No previous reports involving the same study population were available, which prevented any comparisons from being made. In addition, the response rate from medical officers and dental surgeons was not the same, which affected the comparison regarding the level of burnout between the groups. However, the study provides insight into the levels of burnout faced by healthcare professionals during such a stressful situation, which provides future scope for further research into the area.

CONCLUSION

The study reported moderate-to-high levels of burnout among the study participants. On the other hand, levels of PA indicated that they were coping well with the situation. Higher age, service experience, and more number of duty hours reflected more burnout. Higher age and service experience also showed more PA.

PUBLIC HEALTH SIGNIFICANCE

The study assessed the effect of COVID-19 on the mental health of the healthcare providers working within a government setup and managing the situation while dealing with the shortcomings of the system. Hence, it provides an insight into the level of burnout they experienced. It is suggested to develop a policy to acknowledge their work and develop a mechanism to enhance the coping skills among the study participants, as they are the ones in direct contact with the people.

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Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

AUTHORS CONTRIBUTIONS

Bhavna Sabbarwal: Concepts, design, definition of intellectual content, literature search, Statistical analysis, manuscript preparation and editing, manuscript review, guarantor.

Ritu Phogat: Statistical analysis, manuscript preparation and editing, manuscript review.

Shubhi Goel: Literature search, manuscript preparation and editing, manuscript review.

Abhinav Bhargava: Literature search, manuscript preparation and editing, manuscript review.

Adarsh Kumar: Concepts, design, definition of intellectual content, manuscript review.

ETHICAL POLICY AND INSTITUTIONAL REVIEW BOARD STATEMENT

The institutional review board granted ethical clearance for this study (PGIDS/BHRC/24/06).

PATIENT DECLARATION OF CONSENT

Study participants have provided their consent at the start of the study before proceeding to filling and submitting the study proforma.

DATA AVAILABILITY STATEMENT

The data used to fulfill the objectives of the study are presented in the article.

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