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Differential impact of COVID-19 pandemic on psychological well-being: A comparative study of doctors in Delhi and Solan

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Abstract
Background: The COVID-19 pandemic has precipitated unprecedented psychological distress among healthcare professionals globally, with heightened occupational stress contributing to elevated burnout, depression, anxiety, and psychological strain. However, the differential impact across geographic contexts remains inadequately documented, particularly in low- and middle-income countries.
Objective: To examine and compare the psychological well-being and burnout profiles of doctors in urban (Delhi) and semi-urban (Solan) healthcare settings during the COVID-19 pandemic, identifying geographic disparities in mental health outcomes and occupational strain.
Methods: A comparative cross-sectional research design was employed with 106 doctors—53 each from Delhi (mean age: 34.4 ± 10.6 years) and Solan, Himachal Pradesh (mean age: 26.6 ± 4.3 years). Participants completed two standardized instruments: the Depression Anxiety Stress Scale (DASS-21) and the Maslach Burnout Inventory (MBI). Independent samples t-tests were conducted to compare mean scores across psychological strain and burnout dimensions between the two geographic locations.
Results: Delhi-based doctors reported significantly higher levels of depression (M = 7.29, SD = 4.27 vs. M = 3.12, SD = 3.90; t = 5.25, p <. 01), anxiety (M = 6.30, SD = 4.07 vs. M = 4.10, SD = 3.50; t = 2.98, p <. 01), and stress (M = 8.21, SD = 4.11 vs. M = 5.85, SD = 3.82; t = 3.06, p <. 01) compared to Solan doctors. Similarly, Delhi doctors demonstrated significantly elevated burnout across all three dimensions: emotional exhaustion (M = 26.29, SD = 8.24 vs. M = 17.01, SD = 8.09; t = 5.85, p <. 01), depersonalization (M = 14.12, SD = 5.01 vs. M = 9.50, SD = 5.53; t = 4.50, p <. 01), and reduced personal accomplishment (M = 30.76, SD = 7.80 vs. M = 24.24, SD = 10.72; t = 3.50, p <. 01). These substantial differences suggest that the urban healthcare context intensifies occupational stressors and their psychological consequences.
Discussion: The pronounced disparities between Delhi and Solan doctors likely reflect contextual differences in pandemic exposure intensity, patient acuity, workload burden, and organizational resources. Contributing stressors include patient-inflicted violence, fear of disease transmission to family members, inadequate personal protective equipment, lack of COVID-specific training, and extended work hours. The elevated emotional exhaustion among urban doctors underscores the vulnerability of practitioners in high-volume, resource-constrained urban settings.
Conclusions: This comparative analysis demonstrates a significant differential impact of the COVID-19 pandemic on healthcare professionals' psychological well-being across geographic contexts. The marked elevation in depression, anxiety, stress, and burnout among Delhi doctors calls for urgent, context-specific interventions addressing workload management, mental health support accessibility, occupational safety, and organizational culture reform. Future research should elucidate specific mechanisms driving these geographic disparities to inform targeted prevention and intervention strategies. Additionally, longitudinal assessment would clarify whether these disparities persist post-pandemic and identify factors that foster resilience in resource-limited settings.

Keywords: COVID-19 pandemic, psychological well-being, burnout, depression, anxiety, stress, healthcare professionals, urban-rural disparities, comparative study, occupational health, india

Introduction

Since late 2019, the global spread of COVID-19 has affected over 210 countries and territories (Jin *et al*., 2020) [7]. As of 2019, there were approximately 53 million reported cases and over 1.3 million fatalities globally. In the same year, the World Health Organization (WHO) officially recognized burnout as an occupational phenomenon and included it in the International Classification of Diseases (ICD-11) (World Health Organization, 2019) [16]. The pandemic's unpredictable trajectory and high infection and mortality rates among healthcare workers acted as significant triggers for heightened psychological distress. Factors such as social stigma, shortages of personal protective equipment (PPE), and extreme workloads have only compounded the psychological toll on healthcare providers (Guo *et al*., 2020) [6].

Several studies have attempted to estimate burnout prevalence among healthcare professionals. Findings suggest moderate levels of burnout (16.5 ± 7.77), closely associated with age and professional experience (Bazmi *et al*., 2019) [2]. Emotional exhaustion was reportedly lower in males and non-clinical staff, whereas younger personnel exhibited higher burnout. Similarly, in Singapore, high levels of emotional exhaustion (37.8%), depersonalization (29.7%), and reduced personal accomplishment (55.3%) were documented among resident doctors (Tan *et al*., 2022)

[14]. Approximately 43.9% of participants scored high in either emotional exhaustion or depersonalization.

Despite emerging global data, there remains a dearth of comprehensive research from low- and middle-income countries regarding burnout's impact on healthcare workers (Dugani *et al*., 2018) [3]. A meta-analysis on Indian healthcare professionals revealed burnout prevalence rates of 24% (emotional exhaustion), 27% (depersonalization), and 23% (reduced personal accomplishment), with risk factors including younger age, female gender, unmarried status, and unfavorable work conditions (Kesarwani *et al*., 2020) [9]. A related study reported 44.6% of respondents' experienced personal burnout, 26.9% work-related burnout, and 52.8% pandemic-related burnout, with younger individuals (ages 21–30) being most affected. Doctors were 1.64 times more likely and support staff five times more likely to report pandemic-related burnout (Khasne *et al*., 2020) [10].

Excessive work-related stress is a known precursor to burnout. Johnson *et al*. (2020) [8] found that healthcare professionals experiencing stress were more than three times as likely to suffer burnout, with younger individuals and those with low self-esteem being particularly vulnerable.

Burnout and depression often co-occur. Grover *et al*. (2018) [5] reported that 30.1% of medical professionals experienced depression, while nearly 90% exhibited some degree of burnout. Residents showed higher levels of depression and stress than faculty, with factors such as reduced recreational activity and verbal abuse from patients or caregivers contributing to emotional distress.

These cumulative findings suggest an additional burden of emotional and physical stress on doctors during the COVID-19 pandemic. This study aims to explore the differential psychological impact of the pandemic, with a focus on burnout and emotional strain among healthcare professionals.

Materials and Methods

Sample

The study sample comprised 106 doctors—53 each from Delhi and the Solan district of Himachal Pradesh. The mean age ± S.D. of doctors from Delhi was 34.4 ± 10.6 years, while that of Solan-based doctors was 26.6 ± 4.3 years. Both male and female doctors participated, and all held at least an M.B.B.S. degree. Inclusion criteria required a minimum of two years of regular service. Due to limited availability, purposive sampling was used, based on the consent and accessibility of participants. Each scale was self-administered by the respondents.

Demographic information collected included age, gender, educational qualifications, years of service, work setting (urban/rural), and exposure to COVID-19 patients. Two standardized instruments were administered in the following order:

1. Depression Anxiety and Stress Scale (DASS-21)

Developed by Lovibond & Lovibond (1995), DASS-21 is a reliable 21-item self-report tool with three subscales assessing depression, anxiety, and stress. It is widely employed in clinical and research settings to evaluate psychological well-being.

2. Maslach Burnout Inventory (MBI)

The MBI (Maslach & Jackson, 1986) includes 22 items across three dimensions—emotional exhaustion, depersonalization, and personal accomplishment—and is a widely used tool for assessing burnout among professionals in human service roles.

Statistical Analysis

Independent samples t-tests were employed to compare mean scores between Delhi and Solan doctors across the study variables.

Results

Table 1: Comparison of Depression, Anxiety, and Stress between Delhi and Solan Doctors

Variables	Delhi (n = 53) M ± SD	Solan (n = 53) M ± SD	t-value
Depression	7.29 ± 4.27	3.12 ± 3.90	5.25**
Anxiety	6.30 ± 4.07	4.10 ± 3.50	2.98**
Stress	8.21 ± 4.11	5.85 ± 3.82	3.06**

p <. 01

Table 1 presents the comparative mean scores and standard deviations for depression, anxiety, and stress among doctors from Delhi and Solan.

- **Depression**

Doctors from Delhi reported a mean depression score of 7.29 (SD = 4.27), significantly higher than the mean score of 3.12 (SD = 3.90) recorded among doctors from Solan. The difference was statistically significant with t(104) = 5.25, p <. 01, indicating that Delhi doctors experienced markedly more depressive symptoms than their semi-urban counterparts.

- **Anxiety**

The mean anxiety score for Delhi doctors was 6.30 (SD = 4.07), while Solan doctors recorded a lower mean score of 4.10 (SD = 3.50). The difference reached statistical significance (t(104) = 2.98, p <. 01), suggesting that urban healthcare professionals experienced more pronounced anxiety symptoms during the pandemic.

- **Stress**

For stress, Delhi doctors reported a mean score of 8.21 (SD = 4.11), compared to a lower mean of 5.85 (SD = 3.82) among doctors in Solan. The difference was statistically significant (t(104) = 3.06, p <. 01), highlighting higher levels of perceived stress among the urban group.

Collectively, these results point to a statistically and clinically meaningful elevation in psychological distress—across depression, anxiety, and stress—among doctors working in Delhi during the COVID-19 crisis.

Table 2: Comparison of Burnout Components between Delhi and Solan Doctors

Variables	Delhi (n = 53) M ± SD	Solan (n = 53) M ± SD	t-value
Emotional Exhaustion	26.29 ± 8.24	17.01 ± 8.09	5.85**
Depersonalization	14.12 ± 5.01	9.50 ± 5.53	4.50**
Personal Accomplishment	30.76 ± 7.80	24.24 ± 10.72	3.50**

P <. 01

Table 2 compares the two groups on burnout dimensions, namely emotional exhaustion, depersonalization, and personal accomplishment.

- **Emotional Exhaustion (EE)**

Delhi doctors had a mean EE score of 26.29 (SD = 8.24), significantly higher than the mean score of 17.01 (SD = 8.09) reported by Solan doctors. The t-test result ($t(104) = 5.85$, $p <. 01$) indicates a large and statistically significant difference, suggesting greater emotional depletion among urban doctors, likely due to increased workload, patient interaction, and pandemic-related uncertainty.

- **Depersonalization (DP)**

A significant difference also emerged in depersonalization levels, with Delhi doctors reporting a mean score of 14.12 (SD = 5.01) versus 9.50 (SD = 5.53) for Solan doctors. The difference was statistically significant ($t(104) = 4.50$, $p <. 01$), indicating more severe detachment and cynical attitudes among Delhi practitioners—a symptom of burnout often resulting from prolonged exposure to emotionally taxing environments.

- **Personal Accomplishment (PA)**

In terms of personal accomplishment, Delhi doctors reported a mean score of 30.76 (SD = 7.80), which was significantly higher than the mean of 24.24 (SD = 10.72) among Solan doctors ($t(104) = 3.50$, $p <. 01$). While higher scores typically indicate greater perceived accomplishment, the MBI is reverse-scored for this dimension, meaning higher PA scores actually reflect a lower sense of achievement. Thus, these findings suggest that Delhi doctors were experiencing lower professional efficacy and fulfillment, further amplifying the burnout profile in this group.

The patterns evident from the data suggest that environmental context—particularly the urban clinical setting of Delhi, with its higher patient volume, COVID exposure, and systemic stressors—may play a critical role in exacerbating emotional strain and burnout symptoms. In contrast, the comparatively lower scores among Solan doctors may reflect reduced workload, less exposure to severely ill COVID-19 patients, or more community-based care models with lower patient density.

Discussion

This study reveals a pronounced disparity in psychological well-being and burnout between doctors in Delhi and Solan during the COVID-19 pandemic. Delhi-based doctors reported significantly higher scores in depression, anxiety, stress, emotional exhaustion, depersonalization, and lack of personal accomplishment.

Contributing factors may include patient-inflicted violence (reported by 32% of doctors) and fear of infecting family members (reported by 54%) (Somville *et al*., 2021) [13]. Additional stressors, such as lower professional experience and frontline exposure, have been linked to increased psychological strain (Elbay *et al*., 2020) [4]. Ofei-Dodoo *et al*. (2021) [12] documented a strong association between COVID-19-related work stress and burnout, particularly marked by emotional exhaustion and personal distress.

Tuna and Özdin (2021) [15] identified lack of training, PPE shortages, and direct involvement in COVID units as significant predictors of burnout. In India, Menon *et al*. (2022) [11] found that working more than eight hours daily and higher emotional exhaustion and depersonalization scores were closely tied to psychological distress.

These findings reinforce the global consensus that the pandemic has deeply impacted the psychological health of medical professionals. Urban settings such as Delhi may carry additional burdens—higher patient volumes, resource scarcity, and greater infection risk—which exacerbate stress and burnout.

Conclusion

This comparative study highlights the heightened psychological impact of the COVID-19 pandemic on doctors practicing in Delhi relative to those in Solan. Significantly higher levels of depression, anxiety, stress, and burnout were observed among urban doctors. Moreover, the results suggest a differential magnitude of relationship between burnout components and psychological strain across regions.

The findings call for the immediate development and implementation of intervention strategies to assess, prevent, and treat occupational stress, burnout, and associated psychological issues in healthcare professionals. Structural reforms should include policies to reduce work hours, ensure mental health support access, promote work-life balance, and destigmatize mental health discussions in healthcare settings.

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