Original Article

Prevalence of Burnout, Anxiety, and Depression and Their Associated Factors Among Surgical Trainees in Punjab, Pakistan: A Cross-Sectional Study

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Abstract

Background: Burnout, anxiety, and depression are common among surgical trainees and may adversely affect both clinician well-being and patient care. Despite growing international concern regarding trainee mental health, evidence from Pakistan remains limited, highlighting the need for local data to inform institutional policies and support systems.

Objective: To determine the prevalence of burnout, anxiety, and depression and to identify demographic and occupational factors associated with these conditions among surgical trainees in Punjab, Pakistan.

Methods: A cross-sectional study was conducted in 2025 among surgical trainees working in multiple hospitals in Punjab, Pakistan. Data were collected using a structured, self-administered questionnaire. Burnout was assessed using the Maslach Burnout Inventory–Human Services Survey (MBI-HSS), while anxiety and depression symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS). Data were analyzed using IBM SPSS Statistics version 26. A *p*-value of less than 0.05 was considered statistically significant.

Results: Of the 168 eligible trainees invited to participate, 152 completed the survey, yielding a response rate of 90.5%. The mean age was 28.4 ± 2.9 years, and 61.8% of participants were male. Overall, 54.6% of trainees were classified as having burnout. High emotional exhaustion was observed in 68.3%, high depersonalization in 45.1%, and low personal accomplishment in 52.6%. Clinically significant anxiety symptoms (HADS-A ≥ 11) were identified in 47.4% of trainees, while clinically significant depressive symptoms (HADS-D ≥ 11) were identified in 40.1%; 23.0% screened positive for both conditions. Burnout was significantly more prevalent among residents (62.1%) than among house officers (42.9%) and fellows (41.4%) ($p = 0.03$). It was also more prevalent among trainees working ≥ 80 hours per week (66.2%; $p = 0.02$). Multivariable logistic regression revealed that working ≥ 80 hours per week (OR = 2.17, 95% CI: 1.18–4.00, $p = 0.01$) and poor work–life balance (OR = 3.01, 95% CI: 1.57–5.76, $p < 0.001$) were significantly associated with higher odds of burnout. Female gender (OR = 1.92, 95% CI: 1.04–3.55, $p = 0.04$) and perceived lack of institutional support (OR = 2.44, 95% CI: 1.29–4.61, $p = 0.006$) were significantly associated with higher odds of anxiety.

Conclusion: Burnout, anxiety, and depression symptoms were highly prevalent among surgical trainees in Punjab, Pakistan. Excessive working hours and poor work–life balance were associated with burnout, while female gender and perceived lack of institutional support were associated with anxiety. These findings highlight the need for institutional interventions, including mentorship programs, workload optimization, trainee wellness initiatives, and accessible mental health support services.

Keywords: Burnout, Professional; Anxiety; Depression; Internship and Residency; Cross-Sectional Studies; Pakistan.

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Introduction

Burnout, anxiety, and depression are becoming major mental health concerns among surgical trainees worldwide. Burnout is a work-related psychological syndrome characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment resulting from chronic occupational stress.[1] Anxiety refers to excessive fear, worry, and related behavioral disturbances, whereas depression is characterized by persistent low mood, loss of interest or pleasure, and impairment in daily functioning.[2] Intense and stressful workloads, high patient acuity, long duty hours, and the emotional demands of surgical training can impair well-being and increase psychological morbidity among trainees.[3–5] Emotional exhaustion, depersonalization, and a low sense of personal accomplishment, which are the key dimensions of burnout, have been shown to occur commonly in surgical specialties, with prevalence rates of 30–50% reported among surgical trainees internationally.[6–8] Burnout not only affects physician well-being but can also adversely affect patient care and professional fulfillment and has been associated with an increased risk of medical errors.[9–11] Recent studies have shown that anxiety and depression are also common and closely associated with burnout. A systematic review reported that the prevalence of depression among medical residents ranges from 20% to 43%, which is substantially higher than that in the general population.[12] These mental health issues are exacerbated by the rigorous demands of surgical training, inadequate work–life balance, hierarchical work environments, and insufficient institutional support for young doctors.[13–15] These problems are particularly important in low- and middle-income countries (LMICs), such as Pakistan, because of the cultural stigma associated with mental illness, the limited availability of psychological support services, and an already overburdened healthcare system.[16,17]

In Pakistan, surgical trainees frequently work prolonged duty hours, undertake repeated night calls, manage large inpatient and outpatient workloads, assist in emergency services, and participate in operative procedures while simultaneously fulfilling academic and training requirements. A Pakistani study of surgical residents working in public-sector hospitals reported a high burden of burnout in this group.[18] Similarly, a Pakistani study comparing consultant surgeons with postgraduate trainee surgeons found that postgraduate trainees experienced significantly higher levels of depression and anxiety than consultants.[19] Another Pakistani study of medical and surgical postgraduate trainees reported that more than half of the respondents experienced some level of depression, highlighting the mental health burden within postgraduate training environments.[20] These local findings support the need for further data-driven studies on burnout, anxiety, and depression among surgical trainees in Pakistan. However, evidence on the combined burden of these conditions and their associated demographic and occupational factors remains limited. Such evidence is crucial to inform policymaking, guide institutional reforms, and promote the development of trainee support systems aimed at mitigating psychological distress and enhancing professional sustainability. This study aimed to determine the prevalence of burnout, anxiety, and depression among surgical trainees working in multiple hospitals across Punjab, Pakistan, and to identify associated demographic and occupational factors.

Methods

This cross-sectional observational study was conducted from February to April 2025 to assess the prevalence of burnout, anxiety, and depression among surgical trainees working in the surgical departments of multiple hospitals in Punjab, Pakistan. The study population comprised surgical trainees actively enrolled in postgraduate training programs, including house officers (interns), residents, and fellows working in specialties such as general surgery, orthopedics, neurosurgery, plastic surgery, cardiothoracic surgery, urology, and otorhinolaryngology (ENT). Eligible participants were those who had been working in the respective department for at least three consecutive months and who provided written informed consent. Exclusion criteria included trainees on extended leave exceeding one month, those who declined to participate, those with a previously diagnosed anxiety or depressive disorder, those currently receiving treatment for anxiety or depression, and those who submitted incomplete or improperly completed questionnaires.

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The sample size was calculated using Cochran's formula for cross-sectional studies, assuming an expected prevalence of 50%, a 95% confidence level (Z = 1.96), and a margin of error of 8%.[21] The minimum required sample size was approximately 150 participants. To maximize participation, a total of 168 eligible surgical trainees were approached, of whom 152 completed the questionnaire, yielding a response rate of 90.5%. A non-probability convenience sampling technique was employed to recruit eligible surgical trainees from the selected hospitals based on their accessibility and willingness to participate. Data were collected using a structured self-administered questionnaire consisting of three sections. The first section recorded demographic and work-related information, including age, gender, marital status, level of training, average weekly working hours, frequency of night duties, perceived institutional support, work–life balance, and previous mental health history.

The second section utilized the Maslach Burnout Inventory–Human Services Survey (MBI-HSS) for medical personnel to assess burnout across three domains: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA).[22] Burnout was operationally defined as high emotional exhaustion (EE ≥ 27), high depersonalization (DP ≥ 13), and low personal accomplishment (PA ≤ 31), according to established MBI-HSS criteria. Overall burnout was operationally defined as meeting the cutoff criteria in at least two of the three MBI-HSS domains.[22] The third section employed the Hospital Anxiety and Depression Scale (HADS) to assess symptoms of anxiety and depression.[23] The HADS comprises 14 items, with seven items each for anxiety and depression. Scores of 11 or higher on the respective subscales were considered indicative of clinically significant anxiety or depression.[23] Both the MBI-HSS and HADS are internationally validated instruments with established reliability and validity and have been widely used in healthcare populations.[22,23] Therefore, additional test–retest reliability assessments were not performed.

Data collection commenced after obtaining approval from the Institutional Ethics Committee of Mohi-ud-Din Islamic Medical College, Mirpur. Participants were approached during departmental academic activities and through institutional email communication. After obtaining written informed consent, participants completed either printed questionnaires or secure online forms through Google Forms. Unique anonymized identifiers were assigned to maintain confidentiality and prevent duplicate responses. Data collection was conducted over a period of approximately three months.

Data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize demographic characteristics and the prevalence of burnout, anxiety, and depression. Prior to inferential analyses, data normality was assessed using the Shapiro–Wilk test. Normally distributed continuous variables were analyzed using independent-samples t-tests or one-way analysis of variance (ANOVA), whereas categorical variables were analyzed using the chi-square test. Multivariable logistic regression analysis was performed to identify independent predictors of burnout, anxiety, and depression. Variables entered into the regression models included weekly working hours, level of training, gender, marital status, perceived institutional support, and work–life balance. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated. A p-value of less than 0.05 was considered statistically significant. The overall study duration was approximately six months, including one month for ethical approval, three months for data collection, and two months for data analysis and report preparation

Results

A total of 168 surgical trainees were enrolled in the study, out of which 152 completed the questionnaire, resulting in a response rate of 90.5%. The mean age of the participants was 28.4 ± 2.9 years, with ages ranging from 24 to 35 years. The average number of working hours reported per week was 76.3 ± 12.4 hours, and the mean number of night calls per month was 6.5 ± 2.1. Other sociodemographic details of the participants are given in table 1.

The prevalence of burnout, anxiety and depressive symptoms, as assessed using the Maslach Burnout Inventory–Human Services Survey (MBI-HSS) and the Hospital Anxiety and Depression Scale (HADS), is summarized in Table 2.

Burnout prevalence was significantly higher among residents (62.1%) than among house

officers (42.9%) and fellows (41.4%) (p = 0.03). Similarly, burnout was more prevalent among trainees working 80 hours or more per week (66.2%) than among those working fewer than 80 hours per week (p = 0.02).

Female trainees had significantly higher prevalence of anxiety symptoms (58.6% vs. 40.4%, p = 0.04) and depressive symptoms (51.7% vs. 33.0%, p = 0.03) than male trainees. Trainees reporting poor work–life balance had significantly higher prevalence of burnout (72.8% vs. 39.4%, p < 0.001) and anxiety symptoms (60.5% vs. 35.7%, p = 0.01). Marital status was not significantly associated with burnout, anxiety symptoms, or depressive symptoms (p > 0.05).

Table 1: Demographic and Work-related Characteristics of Surgical Trainees (n = 152)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	94	61.8
Female	58	38.2
Marital Status		
Single	107	70.4
Married	45	29.6
Level of Training		
House Officers	43	28.3
Residents	80	52.6
Fellows	29	19.1

Table 2: Prevalence of Burnout, Anxiety, and Depressive symptoms among Surgical Trainees (n = 152)

Outcome	Frequency (n)	Percentage (%)
Burnout (overall)	83	54.6
High emotional exhaustion	104	68.4
High depersonalization	69	45.4
Low personal accomplishment	80	52.6
Anxiety symptoms (HADS-A ≥ 11)	72	47.4
Depressive symptoms (HADS-D ≥ 11)	61	40.1
Concurrent anxiety and depressive symptoms	35	23.0

Note: MBI-HSS = Maslach Burnout Inventory–Human Services Survey; HADS-A = Hospital Anxiety and Depression Scale–Anxiety; HADS-D = Hospital Anxiety and Depression Scale–Depression.

Multivariable logistic regression analysis showed that working 80 hours or more per week was independently associated with higher odds of burnout (OR = 2.17, 95% CI: 1.18–4.00, p = 0.01). Poor perceived work–life balance was also independently associated with higher odds of burnout (OR = 3.01, 95% CI: 1.57–5.76, p < 0.001). Female gender was independently associated with higher odds of anxiety symptoms (OR = 1.92, 95% CI: 1.04–3.55, p = 0.04), while perceived lack of institutional support was also associated with higher odds of anxiety symptoms (OR = 2.44, 95% CI: 1.29–4.61, p = 0.006).

Overall, more than half of the surgical trainees met the study criteria for burnout (54.6%), while 47.4% screened positive for anxiety symptoms and 40.1% screened positive for depressive symptoms.

Discussion

This study assessed the prevalence of burnout, anxiety, and depression among surgical trainees working in multiple hospitals in Punjab, Pakistan, and revealed a substantial burden of psychological distress in this population. More than half of the participants (54.6%) met the criteria for burnout, while 47.4% screened positive for anxiety symptoms and 40.1% screened positive for depressive symptoms. These findings are consistent with previous studies demonstrating high levels of psychological morbidity among surgical trainees and resident physicians worldwide.[3,7,18,24,25] The prevalence of burnout observed in the present study is comparable to findings reported in previous investigations of surgical residents. Malik *et al.* reported a similarly high burden of burnout among surgical residents in a lower-middle-income country, while Lebares *et al.* and Low *et al.* demonstrated that burnout remains highly prevalent among surgical trainees across different healthcare systems.[18,24,25] The demanding nature of surgical training, prolonged working hours, academic responsibilities, sleep deprivation, and emotionally challenging clinical environments likely contribute to the high levels of burnout observed in this population.

A notable observation in the present study was the high prevalence of emotional exhaustion and depersonalization, two core dimensions of burnout. Similar findings have been reported by Appelbaum *et al.* and Chemali *et al.*, who identified workplace stressors, inadequate institutional support, and challenging work environments as major contributors to burnout among healthcare professionals.[26,27] These findings indicate that burnout is influenced not only by individual factors

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but also by organizational and systemic determinants.

The prevalence of anxiety and depressive symptoms identified in this study is also consistent with existing literature. Previous studies have reported high rates of anxiety and depressive symptoms among resident physicians and surgical trainees compared with those in the general population.[12,28–30] Furthermore, Mata *et al.* reported a pooled prevalence of depression of approximately 28.8% among resident physicians, highlighting the vulnerability of this population to mental health disorders.[12] The coexistence of anxiety and depressive symptoms in 23% of participants in the present study further emphasizes the burden of psychological distress experienced by surgical trainees.

In our study, long working hours and poor work–life balance were associated with burnout, while female gender and perceived lack of institutional support were associated with anxiety. These findings are consistent with previous research identifying excessive workload as an important correlate of burnout among surgeons.[33] Trainees working 80 hours or more per week had significantly greater odds of experiencing burnout. Similar concerns have been highlighted in physician-wellness and patient-safety initiatives emphasizing the importance of duty-hour regulation and monitoring trainee well-being.[34]

Poor work–life balance emerged as another significant factor associated with burnout and anxiety. This finding is consistent with previous studies demonstrating that an imbalance between professional responsibilities and personal life adversely affects psychological well-being and overall quality of life.[35] Maintaining a healthy balance between professional commitments and personal life remains an important component of trainee wellness and professional sustainability.

Female trainees in the present study exhibited significantly higher rates of anxiety and depressive symptoms than their male counterparts. Similar gender-related disparities have been reported in previous research.[15,36,37] Female healthcare professionals may experience additional occupational, societal, and family-related pressures that could contribute to psychological distress. These findings highlight the importance of developing gender-sensitive support systems within surgical training programs.

The association between perceived lack of institutional support and increased anxiety identified in this study is also supported by previous literature. Studies have shown that supportive organizational cultures, mentorship opportunities, and accessible mental health resources can help reduce burnout and improve psychological well-being among healthcare professionals.[26,38] Residents who perceive stronger institutional support generally report lower levels of stress, burnout, and psychological morbidity. The findings of this study highlight the importance of establishing structured mental health support systems for surgical trainees. Interventions such as mentorship programs, confidential psychological counselling services, wellness initiatives, stress-management training, and policies aimed at reducing excessive workloads may help improve trainee well-being and reduce burnout.[39] Additionally, fostering a culture of open communication and reducing stigma surrounding mental health may encourage help-seeking behavior among trainees experiencing psychological distress.[40]

Overall, this study provides evidence of the mental health challenges faced by surgical trainees in Pakistan. The observed prevalence of burnout, anxiety, and depressive symptoms highlights the need for institutional measures to promote psychological well-being, strengthen trainee support systems, and improve the overall training environment. Such measures may benefit trainee well-being, support the delivery of quality patient care, and contribute to professional satisfaction and long-term workforce sustainability.

Conclusion

Burnout, anxiety symptoms, and depressive symptoms were highly prevalent among surgical trainees working at different hospitals across Punjab, Pakistan. Longer working hours and poor work–life balance were significantly associated with burnout, while female gender was associated with higher odds of anxiety symptoms. These findings highlight the need to address mental health concerns in surgical training programs. Institutional measures are needed to improve the training environment, strengthen support systems, and protect the psychological well-being of surgical trainees.

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Limitations of the Study

Although the inclusion of participants from multiple hospitals across Punjab improved the representativeness of the sample, the findings may not be generalizable to all surgical trainees in Pakistan. The cross-sectional design precluded causal inference, while reliance on self-reported questionnaires may have introduced reporting bias. Furthermore, other potential contributing factors, such as personality traits and individual coping mechanisms, were not assessed and may have influenced the findings.

Recommendations and Future Research

Institutions should establish accessible and confidential mental health support services for surgical trainees. Duty-hour regulations and rest policies should be reviewed and effectively implemented to reduce burnout. Mental health awareness programmes should be introduced to reduce stigma and encourage help-seeking behaviour. Future studies should involve larger, multicentre populations and employ longitudinal designs to better understand the factors contributing to burnout, anxiety symptoms, and depressive symptoms among surgical trainees.

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