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Prevalence of Burnout and Its Association with Academic Stress among MBBS, BDS, and Allied Health Sciences Students in Pakistan: A Cross-Sectional Study

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ABSTRACT

The situation of healthcare students suffering from burnout is a global issue, but there is limited data on the subject across various healthcare disciplines in Pakistan (MBBS, BDS, Allied Health Sciences). **Objectives:** To establish the prevalence, explore the relationship between academic stress and burnout, and to compare the dimensions of academic stress with the highest correlation scores with burnout, and to compare the level of burnout across demographic factors. **Methods:** The study was of cross-sectional descriptive analytical design conducted in three institutions of Pakistan in the period of January 2026 – April, 2026. Academic stress (8 items) and burnout (12 items) were measured using a structured questionnaire on a 5-point Likert scale. Because data distributions were non-normal, non-parametric tests were used (Spearman's correlation, Mann-Whitney U, Kruskal- Wallis), and the results were based on 306 valid responses. **Results:** In general, 85.7% of students had medium (65.9%) or severe (19.8%) burnout. Total academic stress correlated significantly with burnout (ρ=0.363, 95% CI: 0.257–0.470, $p<0.001$). The individual correlation with "No revision time" was the highest (ρ=0.252). There were no significant differences between males and females, program, year of study, or residence regarding burnout (all $p>0.005$). **Conclusions:** The study found that around 85.7% of the Pakistani healthcare students are experiencing burnout, mainly due to chronic time constraints and cumulative workload. Systemic institutional changes such as curricular changes and accessible mental health support are urgently needed.

INTRODUCTION

Burnout is a psychological condition of chronic stress that results from prolonged exposure to demanding academic and occupational stressors. It was first developed within a clinical context, and later was operationally defined by Maslach and Jackson [1] as comprising three interrelated dimensions: emotional exhaustion, cynicism or depersonalization, and diminished personal or professional efficacy. Burnout is also recognized as a significant public health issue among health sciences students globally, with prevalence rates between 40% and 75% across various health science disciplines including medicine, dentistry, and allied health sciences [2, 3]. High rates are inherent in healthcare education, as it is both intensive and rigorous with high curricular demands, frequent high-stakes testing, and challenging clinical duties. In recent years, student burnout has become a growing concern over systemic problems that have been shown to have a direct impact on academic achievement, mental health, and future healthcare delivery [4]. Therefore, proactive responses of institutions are essential, not only for the well-being of the students, but also for the sustainability of the whole healthcare

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workforce[5]. The healthcare curriculum and psychosocial pressures combine to create academic stress, which is considered the main antecedent of burnout among healthcare trainees. Students from the medical, dental and allied health professions are often burdened with excessive workload, test anxiety, interprofessional competition and the challenge of managing academic workload alongside personal life [6]. Two well-established theories offer explanatory scaffolding for this relationship: the Conservation of Resources (COR) theory [7] and the Job Demands-Resources (JD-R) model [8]. Both theories suggest that burnout is a consequence of a systemic imbalance between ongoing academic demands and students' coping resources. The empirical evidence is always consistent that cumulative stress scores are better predictors of burnout than any one stressor, revealing the synergistic and compounding impacts of various stress factors that are happening concurrently [9]. Healthcare students in Pakistan, and in similar low- and middle-income countries, face a multitude of stressors that significantly increase their risk for burnout compared to the averages reported around the world. Together, examination-driven pedagogies and high student-to-teacher ratios and restricted institutional mental health resources create a chronically high-stress learning context [10]. Though it is well documented that this is the case, empirical studies across several health care programmes such as MBBS, BDS, and Allied Health Sciences in a single institutional context in Pakistan are very limited [10]. The literature is also limited in terms of generalizability and applicability of its findings, due to single-program samples, inconsistent reporting of validated measurement instruments, and the inappropriate application of parametric tests to non-normalized data on burnout[2].

There is a huge gap in the literature that has not yet been investigated that links the simultaneous prevalence of burnout in healthcare students, multidimensional academic stressors, and demographic variables in various healthcare student groups in Pakistan. Initial institutional data indicate that more than 85% of the healthcare students are at risk of at least moderate burnout, which has serious consequences for academic retention, student mental health, and the healthcare workforce of tomorrow. In addition, no studies use nonparametric analytical methods that are suitable for the distribution of the burnout data in this population. Therefore, the present study aimed to find out the prevalence and severity of burnout with students of MBBS, BDS and Allied Health Sciences (AHS), to observe the association of multidimensional academic stress with burnout by Spearman correlation analysis and to find out whether there is any significant difference between the level of burnout with respect to the demographic variables being gender, program type, year of study and residential status.

METHODS

The present study was conducted with a cross-sectional descriptive analytical design to determine the prevalence of burnout in university students of healthcare professions in Pakistan and its relationship with academic stress. The data were gathered from January, 2026 to April 2026 in three institutes, namely University of Lahore (UOL), Lahore, University of Management and Technology (UMT), Lahore, and Sahiwal Medical College (SMC), Sahiwal. The population studied was students on MBBS, BDS, and Allied Health Sciences courses. The sampling technique was convenience sampling, and the data collection technique was a self-administered structured questionnaire using Google Forms. After exclusion of incomplete responses, 306 cases were considered valid and processed for analysis, with 12 of these from non-residents. Participants were recruited using a convenience sampling approach from three healthcare institutions in Punjab, Pakistan. Therefore, the findings should be interpreted within the context of this non-probability sample and may not be fully generalizable to all healthcare students in Pakistan. The minimum sample required was 323, calculated with an assumed burnout prevalence of 70% (based on previous Pakistani studies) with a 95% confidence level and a margin of error of 5%. 355 students were targeted, after identifying 10% incomplete responses. The calculated minimum sample size was 323 participants; however, after excluding incomplete responses, 306 valid questionnaires were available for analysis. Although the achieved sample size was slightly below the target, post-hoc power analysis indicated adequate statistical power (>80%) to detect a correlation coefficient of $\rho \geq 0.16$. This shortfall has been acknowledged as a study limitation." Postgraduate students and faculty members and duplicate responses were not included in the final analysis. A survey questionnaire was divided into three sections. Demographic data were gathered in Section A, such as gender, program of study, year of study, and residential status. For academic stress, Section B adopted 8 Likert-scale items pertaining to workload overload, examination pressure, competition in class, lack of time for revision, inability to complete the syllabus, examination anxiety, work-life balance, and demands of faculty. The academic burnout was assessed by 12 items on a Likert scale for emotional exhaustion, cynicism/detachment, and diminished academic effectiveness within Section C. Each item was rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5), with composite stress scores ranging from 8 to 40 and composite burnout scores ranging from 12 to 60 possible. According to empirical tertiles of the distribution of the composite score in this

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sample, burnout severity was classified as low (≤20), moderate (21–27), and high (≥28). These cutoffs are exploratory and not based on validated MBI SS dimensional cutoffs. Future studies should be based upon the dimension-based classification. No information was collected by design, and electronic data entry was presumed to be informed consent.

All data were analyzed by R statistical software (version 4.6.0). Demographic data variables and level of severity in burnout categories were analyzed using descriptive statistics such as frequencies and percentages. Burnout and academic stress were composite scores that were tested for normality and found not to be normally distributed for both composite scores (burnout: W = 0.979, p<0.001; academic stress: W = 0.987, p=0.007) and thus nonparametric tests were used throughout. Spearman's rank correlation coefficient (ρ) with 95% confidence intervals was used to assess the relationship between the dimensions of academic stress and burnout. The Mann-Whitney U test was used for gender and residential status comparisons and the Kruskal-Wallis H test for program type and year of study comparisons. All analyses were evaluated with a p-value set at < 0.005. Ethical approval was granted by the appropriate institutional bodies and the study was carried out in keeping with the tenets of the Declaration of Helsinki.

RESULTS

Students were placed in the categories of low burnout (12-to-20), moderate burnout (21-to-27), and high burnout (28-to-35) using the composite burnout score (range of 12 to 35). Most (65.9%) reported moderate levels of burnout, 19.8% reported high levels of burnout, and 13.6% reported low levels of burnout. This means that more than 85% of healthcare students experience moderate or severe burnout (Table 1).

Table 1: Burnout Prevalence among Healthcare Students

Burnout Category	n (%)
Low	42 (13.6%)
Moderate	203 (65.9%)
High	61 (19.8%)

Overall, the majority of students agreed, or strongly agreed (usually 60-80%), on all academic stress items, and they were the highest on 'anxious before exams' (78%) and 'overwhelmed by workload' (73%). Emotional exhaustion and physical/mental tiredness were also highly endorsed (>60% agree/strongly agree) for burnout items. Indicators of cynicism/detachment (e.g., less interested, indifferent, detached) had moderate agreement (45–50%). All of these patterns indicate common signs of stress and burnout.

Table 2: Frequency of Responses to Each Likert Item

Items	Strongly Disagree, n (%)	Disagree, n (%)	Neutral, n (%)	Agree, n (%)	Strongly Agree, n (%)
Overwhelmed by Workload	12 (3.9%)	16 (5.2%)	51 (16.6%)	123 (39.9%)	103 (33.4%)
Competition Increases Stress	10 (3.2%)	20 (6.5%)	61 (19.8%)	131 (42.5%)	84 (27.3%)
Difficult to Complete Syllabus	17 (5.5%)	21 (6.8%)	61 (19.8%)	131 (42.5%)	75 (24.4%)
Pressure from Exams	9 (2.9%)	20 (6.5%)	46 (14.9%)	136 (44.2%)	96 (31.2%)
Not Enough Revision Time	15 (4.9%)	20 (6.5%)	58 (18.8%)	137 (44.5%)	77 (25.0%)
Anxious Before Exams	6 (1.9%)	16 (5.2%)	44 (14.3%)	135 (43.8%)	105 (34.1%)
Struggle to Balance Study/Personal Life	9 (2.9%)	23 (7.5%)	59 (19.2%)	123 (39.9%)	93 (30.2%)
Teacher Expectations Stressful	11 (3.6%)	51 (16.6%)	71 (23.1%)	114 (37.0%)	60 (19.5%)

Scatter plot showing the relationship between academic stress scores and burnout scores. The red smoothing line shows the overall trend and the shaded gray area denotes the 95% confidence interval. There is a positive correlation, meaning that as academic stress increases, scores on the burnout scale also increase (Figure 1).

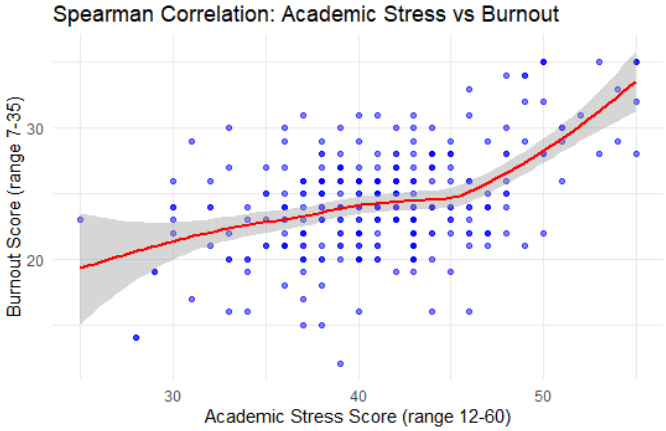

Figure 1: Correlation between Academic Stress and Burnout among Students of Undergraduate Rank

The "no revision time" (ρ = 0.252, p<0.001), "struggle to

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balance study and personal life" (ρ = 0.220, p<0.001), and "difficult to complete syllabus" (ρ = 0.185, p<0.001) dimensions of individual stress had the strongest positive correlations with burnout. The correlation between the total academic stress score and burnout was higher (ρ = 0.363) than any of the single dimensions, suggesting that the overall score predicting burnout is better than any single dimension. There was no significant correlation between "pressure from exams" (p=0.117). These results indicate that time management and workload completion are important factors leading to burnout in health care students(Table 3).

Table 3: Spearman Correlations Between Academic Stress (Individual Dimensions and Composite Score) And Burnout

Stress Dimension/Variables	Spearman's ρ	p-value	95% Confidence Interval
Individual Stress Dimensions			
No Revision Time	0.252	<0.001	0.149 – 0.354
Struggle to Balance Study and Personal Life	0.220	<0.001	0.109 – 0.331
Difficult to Complete Syllabus	0.185	0.001	0.088 – 0.292
Teacher Expectations Stressful	0.174	0.002	0.064 – 0.282
Anxious Before Exams	0.157	0.006	0.046 – 0.266
Overwhelmed by Workload	0.152	0.008	0.041 – 0.262
Competition Increases Stress	0.148	0.010	0.036-0.258
Pressure From Exams	0.090	0.117	0.021 – 0.200
Composite Score			
Total Academic Stress Score	0.363	<0.001	0.257 – 0.470

There was no difference in burnout levels between any of the demographic groups studied (gender, residence, program, or year in program). All the p-values were above 0.005, which means the scores of students' burnout are similar in the following groups: female students vs male students, day scholars vs hostelites, within the three programs (Allied Health, BDS, MBBS) and within the three years of study (1st year to Final year). Across all subgroups, median scores for burnout were consistently 24 or 25 (Table 4).

Table 4: Comparison of Burnout Scores by Demographic Factors

Demographic Factors	Groups Compared	Statistical Test	Test Statistic	p-value
Gender	Female vs. Male	Mann-Whitney U	W = 6602.5	0.862
Residence	Day Scholar vs. Hostelite	Mann-Whitney U	W = 11817.5	0.883
Program	Allied Health, BDS, MBBS	Kruskal-Wallis	$\chi^2 = 1.06$, df = 2	0.587
Year of Study	1st, 2nd, 3rd, 4th, Final	Kruskal-Wallis	$\chi^2 = 2.68$, df = 4	0.611

DISCUSSION

The present study reported a prevalence of burnout at 85.7% among undergraduate healthcare students, including 65.9% in the moderate and 19.8% in the high burnout categories. These are significantly higher than recent, globe-wide estimates of 40-76% in systematic reviews and also higher than similar regional estimates. The high prevalence rates were reported by Haider *et al.* who found 78% prevalence among medical students in Pakistan, and Aljadani *et al.* and Dabbagh *et al.* who found 72% among medical students in Saudi Arabia, and both cited the high prevalence as a result of examination-focused curricula and a lack of mental health support within institutions among students [11, 12]. The high burnout scores observed in all three health professions (MBBS, BDS and Allied Health professions) in this study suggest that the issue is program-wide and not a problem with one program specifically. Chunming et al. reviewed medical students' attitudes in China and did not observe any year of study effect, which the authors related to the high demands in the entire educational process [13]. The strong positive correlation between cumulative academic stress and burnout (ρ = 0.363, p<0.001) was in line with the Conservation of Resources theory and recent empirical studies. Lack of revision time (ρ = 0.252) and difficulty completing the syllabus (ρ = 0.185) were the strongest predictors for individual stress dimensions, while examination pressure alone was not significant (p=0.117). This is in line with Kordzanganeh *et al.* who reported that health professional students in Pakistan suffering from burnout had overall chronic time deficits, which they attributed to a lack of self-efficacy, and not episodic exam anxiety [14]. Hoang *et al.* also found that the combined multi-domain stressor is better than any single stressor in predicting burnout trajectory [15]. The results suggest that interventions to reduce workload density and provide sufficient revision time are more effective burnout-reducing interventions than the intervention to reduce examination anxiety alone. Burnout did not differ significantly between males and females (p=0.863), or between those living away from home and those living at home (p = 0.884); between either program type (p=0.588) or year of study (p = 0.612), with median scores ranging from 24 to 25. Consistent with this, Al-Lawati *et al.* reported that they did not find any gender effect among Omani medical students, where the gender of the students was not seen to moderate the effects of the institutional stressors when they were high enough and pervasive enough [16]. These findings are in accordance with the null finding in the present study that burnout is not a late-year phenomenon, but occurs early and is a constant throughout the entire training period, so that prevention measures should be implemented universally and not exclusively in certain years of the training period [17]. The results have strong implications for institutional change and future studies. The time-constraint and workload-completion stressors were identified as the primary drivers of burnout [14, 18] and support networks significantly mitigated burnout effects even in the face of chronic academic stressors [15];

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multi-component interventions showed larger and more long-lasting effects in reducing burnout than single-component interventions [18]. In Pakistan, the elements of overcrowding, rote-learning pedagogy, and the lack of formal counselling in health care institutions all promote a high-stress learning environment that can lead to burnout at higher rates than what typically occurs in more well-ventilated settings [19, 20]. As no validated cut-off values are available for the composite burnout score used in this study, burnout severity categories were derived from the empirical tertile distribution of the sample scores and classified as low (≤20), moderate (21–27), and high (≥28). These thresholds were used for descriptive purposes only and should not be interpreted as clinically validated MBI-SS severity categories. Future studies should employ validated MBI-SS dimension-specific cut-offs where available. The study was confined to three urban institutions in Punjab, which limits the generalizability of our findings to rural educational settings or other provinces of Pakistan. These regions differ considerably in institutional infrastructure, curriculum delivery, examination schedules, and availability of mental health support services, all of which may influence academic stress and burnout trajectories differently. Moreover, sociocultural norms and language barriers in rural or less-developed areas may affect students' coping mechanisms and willingness to seek help, further constraining the applicability of our results beyond the Punjab-based urban context. Therefore, our prevalence estimates and stressor profiles should be interpreted with caution when extrapolated to the broader national population of healthcare students.

Conclusions regarding the study are limited because of the following: The study design was cross-sectional, which makes it difficult to make causal statements; convenience sampling may have introduced selection bias; and the geographic region of the study does not allow for generalization to other institutions. Some limitations of this study are: The results are not generalizable to other provinces of Pakistan (such as Khyber Pakhtunkhwa and Balochistan) or rural education settings because the sampling was conducted in three institutions in Punjab. Thus, although the prevalence of burnout seems very high in our sample, claims of nationwide representativeness should be made with caution. Longitudinal study designs with nationally representative samples should be used, with the use of fully validated tools like MBI-SS, and mixed methods should be adopted to gain insight into the structural and interpersonal factors related to burnout in Pakistan's healthcare education system.

CONCLUSIONS

This study shows that undergraduate healthcare students in Pakistan suffer from burnout to a great extent, with more than 85% of the study participants found to be suffering from burnout irrespective of their healthcare programs (MBBS, BDS, Allied Health Sciences). Systemic workload pressure, namely chronic workload pressure and difficulty in completing the syllabus, was significantly related to burnout, thus indicating that the systemic workload pressure, not episodic examination anxiety, is the main factor contributing to burnout. The lack of significant gender, program, year of study, and residential differences in the level of burnout suggests that burnout is a structural issue and a problem that needs to be addressed at the institutional level; hence, there is a need for universal preventive measures. The need of the hour is to carry out the necessary institutional changes, including curricular changes, workload reduction, and provision of easily accessible mental health counseling services, to protect the well-being of students and preserve the quality of the healthcare workforce in Pakistan for the future.

Authors' Contribution

Conceptualization: MI
Methodology: MI
Formal analysis: MI
Writing and Drafting: MI, SAK, IF
Review and Editing: MI, SAK, IF, MI

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

The authors declare no conflict of interest.

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