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EXPLORING BURNOUT SYNDROME IN MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY OF PSYCHOLOGICAL DETERMINANTS AND ACADEMIC PERSPECTIVES

By

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Abstract

BACKGROUND: *Over 40% of medical students are affected by burnout worldwide. Academic and clinical stress, depression, and lack of motivation increases rate of burnout, while personal motivation and steadfastness can help reduce it. Consequences include poor mental and physical health, decreased academic performance, and professional growth. Burnout rates vary geographically, with higher rates in Latin America, Asia, and the US compared to Europe.*

MATERIALS AND METHODS: *A cross sectional, descriptive survey was employed in Central Park Medical College, Lahore in May-June 2025 in order to study the prevalence and reasons associated with burnout among medical students. A validated questionnaire was designed to collect data on sociodemographic variables, academic factors, and burnout levels among medical students. The survey assessed various aspects including age, gender, year of study, living situation, average study hours per day, clinical rotation attendance, and perceived support from peers or faculty. A team of 4th year MBBS students conducted the research. A standardized scale was used to evaluate burnout. It assessed emotional exhaustion, physical and mental fatigue, and disengagement from academic work. Medical students from all years were selected for this research. Descriptive and inferential statistics, including t-tests and ANOVA were used to assess data and identify significant differences in burnout levels and their contributing factors across various groups of medical students . A interrelationship study was used to examine and evaluate the link between burnout and academic factors. The results highlighted the prevalence and determinants of burnout among medical students, with statistical analysis applied at a threshold of $p < 0.05$, offering guidance for the development of early interventions and support mechanisms.*

RESULT: *Socio-demographic characteristics of the respondents showed that majority (73.2%) of them were feeling emotionally drained, 76.8% reporting physical and mental fatigue, and 64.3% experiencing less interest in academic work. According to burnout scale male students(13.09) and those in advanced years of study, particularly 5th-year students, reported significantly higher burnout levels. Burnout was inversely correlated with age, while no significant associations were observed with self-study hours or perceived support. Notably, nearly 80% of students fell into the exhausted and disengaged categories, highlighting the urgent need for early interventions and support systems within medical education to prevent escalation and promote student well-being.*

CONCLUSION: *The study concluded that majority (80%) students of Central Park were experiencing burnout symptoms during their academic years, with concerning implications for their well-being and academic performance. Male students particularly 5th year, were significantly more affected. The findings highlighted the need for early interventions and support systems within medical education to reduce burnout and promote student well-being*

Keywords: *Burnout, Medical Students, Medical education, Well-being, Mental health*

INTRODUCTION

Burnout, a syndrome brought on by prolonged exposure to stress at work, is typified by emotions of depletion, cynicism, and depersonalization as well as decreased accomplishment and compassion efficacy.[1] Academic burnout is a problem that affects educational systems at all levels and results in the waste of human resources and related expenses. Cynicism, diminished academic efficacy, and emotional tiredness are the

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three elements that make up academic burnout. Dropout rates are greater, grades are lower, and academic progress is worse for students who are experiencing academic burnout.[2]

The Maslach Burnout Inventory–Student Survey (MBI-SS) is regarded as the standard tool for measuring burnout among students. It examines three aspects: lowered sense of accomplishment, development of cynical attitudes, and emotional exhaustion. Because it is a powerful predictor of burnout symptoms, the cynicism subscale-among the dimensions assessed by the MBI-holds considerable significance in the context of the current study. Originally known as depersonalization, the cynicism dimension included irritation and an inappropriately negative attitude toward coworkers.[3] In 2019, WHO recognized burnout as an occupational phenomena and added it to the International Classification of Diseases (ICD-11).

According to the results of a 2021 systematic review, over 40% of students experienced educational burnout. This result suggests that medical students worldwide are more vulnerable to burnout.[4] Stress and burnout have been found to be major causes of poor mental and. physical health. Actually, studies show itself is linked to increased alcohol use and sleep difficulties, and it may even be a type of depression. [5] Compared to higher secondary schools, undergraduate education entails more social stress and mental tiredness. Strong time management, critical thinking, and self-discipline are necessary for students to handle assignments, tests, and challenging curriculum. For people who are not used to this level of independence, the shift may be too much to handle.

Students are expected to work together on group projects and develop relationships with instructors and classmates outside of the classroom, which can be difficult for those who lack social confidence or collaborative experience.[6] Medical school training is a time of great stress for medical students. Due to their limited exposure to life outside of their homes, the majority of pupils are in their late teens or early adulthood when they are admitted, making them more vulnerable to mental health issues. Comparative data from a study revealed that the number of mental health diagnoses throughout medical school increased from 1.8% prior to admission to 5.7% during that time.[7]

Reports indicate that burnout symptoms were distributed as follows: reduced academic efficacy was observed in 30.9% of students, cynicism in 31.6%, and emotional exhaustion in 55.4%. Additionally, the study discovered that students from Latin America, Asia, and the United States had higher rates of burnout than from Europe, with medical, nursing, an students experiencing especially high levels of burnout.[8] Since academic achievement anxiety (AAT) has a direct influence on university students academic performance and entire educational experience, it is also a serious problem. AAT is characterized as a condition of increased anxiety and concern about performance results and academic assessments. Excessive anxiety can cause avoidance behaviors, lower learning efficiency, and affect cognitive functioning.

Few research have comprehensively addressed the links between academic anxiety and burnout from a single theoretical perspective or in the context of student mental health, despite the fact that both have been studied separately in the context of physical education.[9] Medical students in Asian nations were found to have signs of depression in 31.9% of cases, anxiety in 32.9%, and stress in 14.6% of cases. Academic burnout was detected in about 44.2% of medical students, according to an analytical study, and in some regions of China, it has reached 83.49%.[10]

The main motivation of medical students is not to avoid burnout. Along with prosocial goals, a complex range of other motives, such as competitiveness, status, and the development of personal social capital, drive their enrollment into clinical training. Medical students have highlighted the necessity to take into account the viability of interventions and have remarked on striking a balance between putting money into their well-being and demands that are both intrinsically and externally motivated.[11] Medical service quality is impacted by academic burnout. Furthermore, it hinders medical students' professional growth, erodes their character and abilities, and increases medical errors, poorer patient treatment, and decreased patient satisfaction.[12]

METHODOLOGY

A cross-sectional descriptive design was employed to explore the prevalence, degree, and correlates of burnout among MBBS students across all academic years. The research was conducted in Central Park Medical College Lahore in Punjab, ensuring representation from all academic years of the MBBS program. All undergraduate medical (MBBS) students currently enrolled in 1st to final year were included in this study. All students gave their consent to participate. All non-medical students and students who were on long-term leave or who have recently taken a gap year were excluded. Sample Size was calculated and it consisted of approximately 200 students including both genders. Convenient sampling was used based on year of study to ensure proportional representation. Data collection tools included a structured self-administered questionnaire containing three essential parts. First one was demographic information on as age, gender, year of study, residence (hosteller/day scholar), etc. Second included academic-related questions as study hours, academic satisfaction, exam stress, etc. Third was burnout assessment which measured 3 domains: Emotional Exhaustion, Depersonalization (Cynicism), and Personal Accomplishment (Academic Efficacy).

Data collection procedure included the distribution of final survey physically also via secured online platforms (e.g., Google Forms, MS Forms) to ensure anonymity and voluntary participation with informed consent . Variables were year of study, gender, academic workload, lifestyle habits, sleep patterns and burnout levels. Data analysis included data entry and cleaning using Microsoft Excel. SPSS was used for statistical analysis. Descriptive statistics (means, standard deviations, frequencies, and percentages) were computed, and inferential analysis of categorical data was performed through

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the Chi-square test. Ethical considerations were provided like informed consent from all participants, assurance of anonymity and confidentiality, right to withdraw consent at any point without any consequence, and support information for mental health services in case any participant feels distress during the process.

RESULTS

Prevalence and Severity of Burnout Among Medical Students

Table 1: Descriptive Statistics of Core Burnout Indicators

Burnout Indicator	Mean (SD)	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
I feel emotionally drained by my studies.	2.01 (1.035)	2 (1.8)	10 (8.9)	18 (16.1)	39 (34.8)	43 (38.4)
Studying or clinical rotations make me feel worn out.	2.00 (0.930)	-	11 (9.8)	15 (13.4)	49 (43.8)	37 (33.0)
I feel burnt out by the academic demands placed on me.	3.12 (1.463)	35 (31.3)	10 (8.9)	11 (9.8)	45 (40.2)	11 (9.8)
I've become less interested in my academic work.	2.30 (1.073)	2 (1.8)	18 (16.1)	20 (17.9)	44 (39.3)	28 (25.0)
I doubt whether becoming a doctor is the right choice	2.33 (1.110)	-	24 (21.4)	21 (18.8)	35 (31.3)	32 (28.6)

The results indicate a notable prevalence and severity of burnout among students based on their self-reported experiences. A majority of participants agreed or strongly agreed that they felt emotionally drained by their studies (73.2%), with a mean score of 2.01 (SD = 1.035), suggesting a high emotional toll associated with academic demands. Similarly, feeling worn out due to studying or clinical rotations was also prevalent, with 76.8% expressing agreement, reflecting a mean score of 2.00 (SD = 0.930), pointing toward significant physical and mental fatigue. The sense of being burnt out by academic demands had a slightly higher mean of 3.12 (SD = 1.463), with 50% agreeing or strongly agreeing. Notably, 31.3% strongly disagreed, possibly indicating variability in how burnout is experienced among students. Regarding interest in academic work, 64.3% agreed or strongly agreed that they had become less interested, with a mean score of 2.30 (SD = 1.073), suggesting early signs of emotional disengagement. Finally, doubt about choosing the medical profession was present in a substantial portion, with 59.9% expressing agreement or strong agreement and a mean of 2.33 (SD = 1.110), indicating that burnout might be affecting students' long-term commitment and career identity.

Table 2: Burnout Scores by Sociodemographic and Academic Groups

Variable	Category	Mean Burnout Score (SD)	Statistical Test (p-value)
Gender	Male	13.09 (3.206)	2.364 (0.020)
	Female	11.43 (2.884)	
Current Living Situation	Day Scholar	11.58 (2.831)	-0.970 (0.334)
	Hostel	12.18 (3.389)	
Year of Study	1st Year MBBS	10.33 (4.041)	2.543 (0.044)
	2nd Year MBBS	13.57 (1.272)	
	3rd Year MBBS	10.71 (3.352)	
	4th Year MBBS	11.51 (3.024)	
	5th Year MBBS	14.00 (1.936)	

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Attends Clinical Rotations?	Yes	12.00 (2.913)	1.593 (0.114)
	No	10.92 (3.239)	

Statistical significance is typically set at $p < 0.05$.

The analysis of burnout scores across sociodemographic and academic groups reveals significant variation based on gender and year of study. A significant gender difference was observed in burnout scores, with males (M = 13.09, SD = 3.206) reporting higher levels compared to females (M = 11.43, SD = 2.884; p = 0.020). This finding indicates a greater susceptibility to academic burnout among male students in the present study.

When considering current living situation, students residing in hostels had slightly higher mean burnout scores (Mean = 12.18, SD = 3.389) than day scholars (Mean = 11.58, SD = 2.831); however, this difference was not statistically significant (p = 0.334), suggesting that living arrangement may not strongly influence burnout levels in this context.

A significant difference in burnout was observed across different years of study (p = 0.044). Students in the 5th year reported the highest burnout levels (Mean = 14.00, SD = 1.936), followed closely by 2nd year students (Mean = 13.57, SD = 1.272). In contrast, 1st and 3rd year students had the lowest scores (Mean = 10.33 and 10.71, respectively), indicating that burnout tends to peak during mid to final years, possibly due to increasing academic and clinical responsibilities.

Lastly, students who attended clinical rotations had higher burnout scores (Mean = 12.00, SD = 2.913) than those who did not (Mean = 10.92, SD = 3.239), although this difference was not statistically significant (p = 0.114). This trend may still suggest that clinical exposure adds to students' stress levels, even if the relationship isn't statistically confirmed in this sample.

Overall, the findings highlight that male gender and advanced years of study are significantly associated with higher burnout, whereas living situation and clinical rotation attendance show trends but no significant differences.

Table 3: Correlation Matrix of Burnout Indicators and Continuous Academic Factors

Variable	Composite Burnout Score (r)	p-value
Age	-0.230	0.014
Average No of self-study per day	-0.046	0.630
How often do you feel supported by peers or faculty?	-0.039	0.686

The correlation matrix in Table 3 reveals important associations between burnout and academic factors among students. The analysis revealed a significant inverse correlation between age and burnout (r = –0.230, p = 0.014), implying that older students are less likely to experience burnout, potentially due to greater emotional resilience. No significant correlations were detected between burnout and average hours of self-study (r = –0.046, p = 0.630), or with perceived support from peers and faculty, indicating that these variables, while academically relevant, may not directly influence burnout in a statistically meaningful way in this sample. These findings imply that age may act as a protective factor against burnout, whereas the quantity of study hours or perceived social support might not be sufficient alone to buffer against it. However, the complexity of these relationships—as highlighted in prior discussion—suggests that burnout could both influence and be influenced by study behavior and academic stressors, warranting deeper investigation into systemic academic pressures and support mechanisms.

Table 4: Comparison of Burnout Scores by Informal Help-Seeking Status

Group	Mean Burnout Score (SD)	t-Statistics	P-Value
A	11.71 (2.948)	-0.271	0.787
B	11.89 (3.236)		

The comparison of burnout scores between students who reported having someone to talk to when stressed (Group A: Mean = 11.71, SD = 2.95) and those who did not (Group B: Mean = 11.89, SD = 3.24) reveals no statistically significant difference (t = -0.271, p = 0.787). This suggests that in this sample, informal help-seeking behavior is not significantly associated with lower burnout levels.

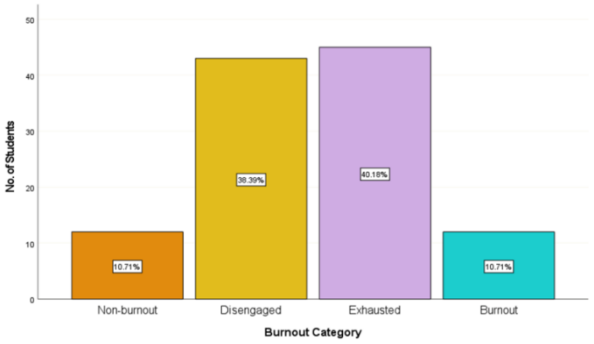

Figure 1: Burnout categories among participated medical students

The bar graph illustrates the distribution of medical students across four categories of burnout based on their composite scores. The majority of students fall into the Exhausted (40.18%) and Disengaged (38.39%) categories, indicating that nearly 80% of the sample is experiencing moderate levels of burnout symptoms such as emotional fatigue or detachment from academic work. In contrast, only 10.71% of students are categorized as experiencing full burnout, while an equal

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percentage (10.71%) are in the non-burnout group, suggesting a small minority are either significantly distressed or entirely unaffected. These findings highlight a concerning trend: although few students are in full burnout, a large proportion are showing early warning signs (disengagement or exhaustion), which could progress into more severe burnout if unaddressed. This pattern underscores the urgent need for early interventions and support systems within medical education to prevent escalation and promote student well-being.

DISCUSSION:

Burnout is a complex, polyetiological psychological syndrome characterized by pervasive emotional, somatic, and intellectual depletion, engendered by prolonged exposure to intractable stress. It is increasingly recognized among medical students, emerging as a pervasive phenomenon, attributable to relentless academic demands, introduction of modular system, day by day changing of academic policies especially increasing the passing criteria from 50% to 65% and constant pressure to meet both self-imposed and institutional expectations. Stress, while often considered a normal component of academic life, becomes pathological when inadequately managed, serving as a precursor to burnout. Our study seeks to identify context-specific predictors and psychological variables to spot the prevalence of burn out in medical students of Central Park Medical College, Lahore.

Furthermore, we aim to point out the emotional support available to students to cope their stress and burn out and the future strategies we can develop to reduce the percentage of present burn out and preventing its occurrence in near future. This observational study evaluated the prevalence and predictors of burnout among 112 undergraduate medical students at Central Park Medical College. In this study, we stated the prevalence of stress by discussing different variables as follow. The findings of our study at Central Park Medical College revealed a high prevalence of burnout symptoms among medical students particularly emotional exhaustion and disengagement, a total of 73% students met criteria for moderate to severe burnout, a figure comparable to several international studies that reported burnout prevalence ranging between 37% to 75% among medical students.[13] These figures aligned with global trends indicating emotional exhaustion as the dominant dimension of burnout among medical students.[14,15] and also mirrored other studies, where over 49% of students exhibited symptoms of exhaustion due to academic stressors. [16] In our study, emotional disengagement was the most prevalent, with 64.3% of students reporting reduced interest in academic work and 59.9% questioning their career choice. This reflected depersonalization and a loss of personal accomplishment, also observed in U.S. and European cohorts. A study by Dyrbye et al. among American medical students similarly found that nearly half experienced doubt about pursuing medicine and reported diminished enthusiasm for academic tasks.[17]

Gender differences were particularly notable, with male students exhibited significantly higher burnout scores (Mean = 13.09) than females (Mean = 11.43; p = 0.02). While our data contradicted some studies indicating higher female burnout,[18] whereas it aligned with a recent Pakistani study where male students reported more burnout, possibly due to different sociocultural stressors or coping expectations.[19] This suggested that gender-based burnout trends may be influenced by local contexts, developed or underdeveloped countries, also some stigmas, calling for gender-sensitive interventions .Burnout levels also varied significantly by year of study (p = 0.044), with 5th and 2nd-year students reporting the highest levels. This trend was consistent with prior research indicating that academic workload and uncertainty in early years and clinical burden in final years intensify burnout.[20]

A multicenter European study similarly found that burnout peaked during transitions—either entering clinical rotations or preparing for final exams.[21] Our data supported this, with higher burnout observed in students attending clinical rotations (Mean = 12.00) versus those who did not (Mean = 10.92), although the difference was not statistically significant (p = 0.114).Living situation (hostelite vs. day scholar) did not show a significant association with burnout (p = 0.334), though hostel residents had slightly higher mean scores.

Prior studies showed mixed results on this variable; some suggested that hostelite students experience greater isolation and stress as was reported in a study at Delhi hostel,[22] while others reported stronger peer support and coping mechanisms in residential settings.[23] Our findings thus reflected a balance of these effects.

Interestingly, older age was found to be inversely correlated with burnout (r = -0.230, p = 0.014), suggesting emotional maturity may buffer stress. Similar associations had been reported in longitudinal studies, which highlighted that as students mature, they develop improved emotional regulation and coping skills.[24] This suggested the importance of early development of these skills during preclinical years. Contrary to expectations, no significant relationship was found between burnout and number of study hours (r = -0.046, p = 0.630), or with perceived support from peers or faculty (r = 0.039, p = 0.686). These findings were echoed in recent literature, which proposed that qualitative aspects of academic engagement and support, such as meaningful mentorship and emotional connection, were more predictive of student well-being than quantitative study metrics. [25,26]

Regarding coping strategies, students who reported having someone to talk to when stressed did not show statistically lower burnout scores (p = 0.787), a result that contrasted with evidence from studies that showed the findings where interpersonal communication, both with peers and family, served as a primary support mechanism for alleviating stress and anxiety.[27] This discrepancy may stem from cultural stigmas around mental health or lack of structured support systems in our setting. A systematic review by Frajerman et al. emphasized that availability alone is insufficient unless paired with accessibility and trust in support services.[28]

Furthermore, the distribution of students into burnout categories showed that nearly 80% of the participants were

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either emotionally exhausted or disengaged, with 10.71% in full burnout. These rates were consistent with findings from some other studies, where 40-60% of medical students exhibited moderate to high burnout levels.[29,30,31] This study was conducted at a single institution (Central Park Medical College), which may limit the generalizability of findings to other medical schools with different curricula, cultural contexts, or academic pressures. The cross-sectional design restricts causal inference, as associations between predictors and burnout cannot establish temporal or directional relationships. Reliance on self-reported measures may have introduced response bias, including underreporting due to stigma or overreporting due to heightened stress during data collection. The relatively small sample size may have reduced the statistical power to detect subtle associations, particularly in subgroup analyses such as gender or year of study.

CONCLUSION

This study underscores the considerable prevalence of burnout among medical students, with emotional exhaustion and academic disengagement emerging as the most prominent dimensions. All the findings are consistent with international research, reinforcing that burnout is not limited to specific educational systems but is a global concern in medical education. Therefore, addressing this issue requires institutional commitment toward structural and psychological reforms. Future interventions should include accessible mental health services, integration of wellness and coping skills into the curriculum, and regular screening to identify at-risk students. Medical colleges must also promote a supportive academic environment through faculty training, flexible scheduling, and protected time for rest and extracurricular engagement. Early recognition and timely intervention can help prevent the progression of burnout and support medical students in maintaining their psychological resilience and professional identity.

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