Original Article

Association between Burnout and Emotional Intelligence among Medical Students Enrolled in An Integrated Modular Curriculum

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Author's Contribution

[5,6] *Conception of Study*
[1,2,4,5,6,7,8] *Experimentation/Study Conduction*
[1,2,3] *Analysis/Interpretation/Discussion*
[1,2,3,7,8] *Manuscript Writing*
[5,6] *Critical Review*
[1,2,4] *Facilitation and Material Analysis*

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Article Processing

Received: 15/09/2025
Accepted: 20/12/2025

Cite this Article: ***Riaz MA, Sohail MH, Khan MT, Zahid MA, Noreen K, Jabeen M, Shahzad F, Khan AZ. Association between burnout and emotional intelligence among medical students enrolled in an integrated modular curriculum. SJRMC. 2025; S2:25.***

Conflict of Interest: *Nil*
Funding Source: *Nil*

Access Online:

Abstract

Background: Medical student burnout is critical. Emotional intelligence inversely correlates with protecting against it. This study explores their link in integrated modular curricula.

Objectives: To compare burnout prevalence and emotional intelligence correlation among medical students at Rawalpindi Medical University and Shifa College of Medicine in an integrated modular curriculum.

Materials and Methods: This cross-sectional study was conducted at Rawalpindi Medical University and Shifa College of Medicine, involving 350 medical students enrolled in an integrated modular curriculum. Participants completed self-administered questionnaires assessing burnout (using BCSQ12SS) and emotional intelligence (using BEIS-10). Data analysis included descriptive statistics, t-tests, ANOVA, and correlation analyses to determine the relationship between burnout, emotional intelligence, and demographic variables. Non-parametric tests were used due to deviations from normality. Multiple linear regression was employed to assess the variance in emotional intelligence scores explained by burnout and other factors.

Results: The study revealed moderate levels of emotional intelligence (mean BEIS-10 score of 36.35) and varying levels of burnout subtypes, with the Overload dimension showing a mean score of 16.85. A significant positive correlation was found between burnout (BCSQ) and emotional intelligence (BEIS-10). Sleep deprivation and low physical activity were associated with higher burnout scores. Specifically, a weak positive correlation existed between BEIS-10 scores and Frenetic type of burnout ($r = 0.227$, $p < 0.001$) & Lack of Development type of burnout ($r = 0.179$, $p < 0.001$).

Conclusion: The study found a notable prevalence of the "frenetic" Overload subtype of burnout, even with moderate-to-high emotional intelligence, which showed no significant differences across institutions or demographic groups. Targeted interventions like skills training and support systems are needed for student well-being.

Keywords: Burnout, Medical Students, Emotional Intelligence, Mental Health

Introduction

The World Health Organization (WHO) in the 11th Revision of the International Classification of Diseases (ICD-11) in 2019 defined burnout as an occupational phenomenon resulting from chronic workplace stress that hasn't been effectively controlled. Three dimensions define it as sensations of weariness or low energy, decreased professional efficacy, or a greater mental detachment from one's work, or sentiments of gloom or disdain about it.[1] The escalating prevalence of burnout among medical students represents a critical challenge to the integrity of medical education and the future of healthcare delivery. This phenomenon, characterized by emotional exhaustion, depersonalization, and diminished personal accomplishment, transcends mere fatigue, manifesting as a systemic crisis with profound ramifications.[2]

Currently, emotional intelligence (EI) is understood as the ability to accurately perceive, understand, and regulate emotions in oneself and others. This skill operates across both intrapersonal and interpersonal contexts, and within diverse sociocultural as well as digital environments[3] It transcends mere recognition, enabling strategic deployment of emotional data for enhanced cognitive function, communicative efficacy, and relational optimization. Contemporary EI prioritizes adaptive acumen and cultural fluency, critical for navigating a globally networked reality.[4] These constituent elements confer the capacity for stress attenuation, resilience fortification, empathic resonance, and adept navigation of intricate interpersonal landscapes—competencies of paramount significance within the demanding milieu of medical pedagogy.[5] Augmented emotional intelligence demonstrably mediates stress burden, potentiates empathic capacity, and optimizes interpersonal functioning, thereby serving as a salient prophylactic against burnout pathogenesis.[6]

Multiple studies in both Pakistan and internationally have found an inverse correlation between EI and burnout among medical students. For example, a study at HITEC-IMS Taxila (n=223) reported $r=-0.27$ ($p< 0.001$), while surveys in the United States and another Pakistani cohort reported correlations ranging from – 0.27 to -0.59 (all $p< 0.001$). [7,8] Some studies also identify age as a moderator of burnout risk, suggesting demographic influences on the relationship. These findings underscore EI's protective role against burnout across healthcare education. [9]

This study aims to investigate the current understanding of burnout dynamics by conducting a comparative analysis of burnout prevalence and its correlation with emotional intelligence among medical students at Rawalpindi Medical University and Shifa College of Medicine. The study will specifically examine these associations within the context of an integrated modular curriculum.

Research on burnout and emotional intelligence (EI) within an integrated modular

curriculum is currently scarce, as most existing studies focus on traditional or problem-based learning (PBL) frameworks. This study seeks to address these gaps in the literature.

Materials and Methods

This Analytical Cross-sectional study was conducted from March 2025 to June 2025 at Rawalpindi Medical University and Shifa College of Medicine. Data were collected through a self-administered questionnaire via Google Forms. The study population comprised MBBS students enrolled in the 2nd to 5th academic years at both institutions. Students with pre-diagnosed neuropsychiatric illness were excluded from the study to minimize confounding effects on emotional and psychological parameters. A cumulative sample size of 350 participants was calculated using the World Health Organization (WHO) Sample Size Calculator, based on a 95% confidence interval, 5% margin of error, and an estimated population prevalence of 55%. Participants were recruited through a non-probability convenience sampling technique.[10]

The use of the data for research purposes was explained, and written consent in the first section of the online survey was obtained from all participants before filling in the questionnaire. The questionnaire consisted of 3 sections. The first part comprised of demographics including name of medical school, gender, marital status, year of study, frequency of undergoing exams, accommodation status, financial status, number of sleeping hours, history of pre-diagnosed neuropsychiatric illnesses & workout frequency. The second part included the Burnout Clinical Subtype Questionnaire, Student Survey (BCSQ12SS).[10] The BCSQ-12-SS consists of 12 questions evenly distributed across three main dimensions, each corresponding to a specific burnout subtype; the First Dimension is Overload (Frenetic Subtype), which includes questions related to students who are highly involved, ambitious, and invest a significant amount of time and effort in their studies, often at the expense of their health and personal life. It aligns with the traditional concept of "exhaustion". Second Dimension is Lack of Development (Under-challenged subtype): This component includes questions describing students who experience feelings of indifference, boredom, and a lack of personal growth or challenge in their academic tasks aligning with the concept of "cynicism". Third Dimension is Neglect (Worn-out subtype): which includes questions characterizing students who feel a loss of control over their academic outcomes, a lack of recognition for their efforts, and may start to neglect their responsibilities, aligning with the concept of “inefficiency”. Each of the 12 items was rated on a 7-point Likert scale, ranging from "totally disagree" to "totally agree," to indicate the degree of agreement with the statement. The third part included Brief Emotional Intelligence Scale (BEIS-10). [11] The Brief Emotional Intelligence Scale (BEIS-10) is a concise, 10-item self-report questionnaire designed to measure emotional intelligence (EI) in adults assessing

five distinct components of emotional intelligence, each represented by two items including Appraisal of Own Emotions, Appraisal of Others' Emotions, Regulation of Own Emotions, Regulation of Others' Emotions & Utilization of Emotions. Items were rated on a Likert scale (1 to 5). Ethical Approval was taken from the Institutional Review Board of Rawalpindi Medical University. SPSS version 26 was used to enter & analyze the data.

For demographics, descriptive statistics were applied. The BCSQ12SS scores were categorized into high and low burnout categories by setting the cutoff at the 75th percentile. [12] As no standard classification was available for BEIS-10 scores, we categorized them into high and low categories by comparing them to the median value (Low EI < Median & High EI > Median). The association of high & low BCSQ12SS & BEIS-10 scores with the demographics was evaluated by using the Chi-Square test (p-value <0.05 was considered statistically significant). The association of various Burnout subtypes, i.e., Frenetic, Lack of Development, Neglect, with demographics was calculated by first calculating the Inter-Quartile Range of all three burnout subtypes for each demographic group and then applying the Chi-Square test (p value <0.05 was considered statistically significant). Spearman's rank correlation was applied to quantify the relationship between total BCSQ12SS & various burnout subtype scores with BEIS-10 scores.

Results

A total of 350 medical students participated in this study, comprising 318 students from Rawalpindi Medical University and 32 students from Shifa College of Medicine. Table 1 shows the total number and percentages of various demographic categories of the study participants.

Table 1 *Sociodemographic Details of Study Participants.*

Variable	N (%)
Medical school	
Rawalpindi Medical University	318(90.9%)
Shifa College of Medicine	32(9.1%)
Gender	
Male	118(33.7%)
female	232(66.3%)
Marital status	
Single	345(98.6%)
Married	5(1.4%)
Year of study	
Second year	83(23.7%)

Third year	86(24.6%)
Fourth year	83(23.7%)
Final year	98(28.0%)
Exam frequency	
Every 3-6 weeks	324(92.6%)
Every 3 months	22(6.3%)
Every 6 months	4(1.1%)
Accommodation status	
Day-scholar	276(78.9%)
Hostellite	74(21.1%)
Financial status	
Low income (< Rs. 50,000 per month)	10(2.9%)
Middle income (Rs. 50,000 – Rs. 100,000 per month)	113(32.3%)
High income (> Rs. 100,000 per month)	227(64.9%)
Sleeping hours	
>6 hours	195(55.75)
<6 hours	155(44.3%)
Workout frequency	
No workout	201(57.4%)
>3 times a week	71(20.3%)
<3 times a week	78(22.3%)

Note. Numbers and percentages of various demographic characteristics of participants.

The BEIS-10 total scores ranged from 10 to 50, with a mean score of 36.35 (SD = 6.34), indicating moderate levels of burnout in the overall cohort. The BCSQ Overload subscale ranged from 4 to 28, with a mean score of 16.85 (SD = 5.87). To evaluate the suitability of parametric testing, the data distributions for BEIS-10 and BCSQ dimensions were assessed using Kolmogorov-Smirnov and Shapiro-Wilk tests. The results demonstrated significant deviation from normality: - BEIS-10: Shapiro-Wilk: $W = 0.934$, $p < 0.001$; Kolmogorov-Smirnov: $D = 0.124$, $p < 0.001$- BCSQ Overload: Shapiro-Wilk: $W = 0.982$, $p < 0.001$; Kolmogorov-Smirnov: $D = 0.064$, $p = 0.001$, which indicated the use of non-parametric tests for data analysis.

Table 2 shows the association between high and low burnout (BCSQ-12SS) and Emotional Intelligence (EI) (BEIS-10) scores with various demographic categories. For burnout, there was no statistically significant association between demographic variables and burnout levels ($p>0.05$). For EI, a statistically significant association was observed only with the number

of sleeping hours ($p<0.05$), where individuals sleeping more than 6 hours were more likely to have higher EI scores. All other associations between the demographic categories and both burnout and EI scores were statistically insignificant ($p>0.05$).

Table 3 shows the association between the interquartile range (IQR) of various burnout subtypes and demographic categories. Significant association was noted between frenetic type of burnout and demographic categories like gender, exam frequency, number of sleeping hours & workout frequency ($p<0.05$). For the lack of Development type of burnout, a significant association was noted for only the number of sleeping hours ($p<0.05$). For the Neglect type of burnout, a significant association was noted for only gender & no of hours the participant did workout ($p<0.05$).

Table 2 *Association of Demographic Variables with High and Low Burnout and Emotional Intelligence, respectively.*

Variable	High burnout	Low burnout	p-value	High EI	Low EI	p-value
Medical school						
Rawalpindi Medical University	89(92.7%)	229(90.2%)	0.460	156(91.8%)	14(8.2%)	0.567
Shifa College of Medicine	7(7.3%)	25(9.8%)		14(8.2%)	18(10.0%)	
Gender						
Male	28(29.2%)	90(35.4%)	0.269	63(37.1%)	55(30.6%)	0.198
Female	68(70.8%)	164(64.6%)		107(62.9%)	125(69.4%)	
Marital status						
Single	95(99.0%)	250(98.4%)	0.708	168(98.8%)	177(98.3%)	0.699
Married	1(1.0%)	4(1.6%)		2(1.2%)	3(1.7%)	
Year of study						
Second year	19(19.8%)	64(25.2%)	0.490	37(21.8%)	46(25.6%)	0.637
Third year	21(21.9%)	65(25.6%)		46(27.1%)	40(22.2%)	
Fourth year	25(26.0%)	58(22.8%)		38(22.4%)	45(25.0%)	
Final year	31(32.3%)	67(26.4%)		49(28.8%)	49(27.2%)	
Exam frequency						
Every 3-6 weeks	91(94.8%)	223(91.7%)	0.598	159(93.5%)	165(91.7%)	0.758
Every 3 months	4(4.2%)	18(7.1%)		9(5.3%)	13(7.2%)	
Every 6 months	1(1.0%)	3(2.1%)		2(1.2%)	2(1.1%)	
Accommodation status						
Day-scholar	75(78.1%)	209(7.1%)	0.837	137(80.6%)	139(77.2%)	0.441
Hostellite	79(79.1%)	53(20.9%)		33(19.4%)	41(22.8%)	

Financial status						
Low income	1(1.0%)	9(3.5%)		4(2.4%)	6(3.3%)	
Middle income	37(38.5%)	76(29.9%)	0.171	55(32.4%)	58(32.2%)	0.859
High income	58(60.4%)	160(66.5%)		111(65.3%)	116(64.4%)	
Sleeping hours						
>6 hours	46(47.9%)	140(58.7%)	0.071	85(50.0%)	110(61.1%)	0.036
<6 hours	50(52.1%)	105(41.3%)		85(50.0%)	70(38.9%)	
Workout frequency						
No workout	56(58.3%)	145(57.1%)		89(52.4%)	112(62.2%)	
>3 times a week	14(14.6%)	57(22.4%)	0.173	37(21.8%)	34(18.9%)	0.153
<3 times a week	26(27.1%)	52(20.5%)		44(25.9%)	34(18.9%)	

Note. High burnout signifies >75th percentile and low burnout signifies <75th percentile, while EI represents emotional intelligence.

Table 3 *Analysis of Three Categories of Burnout (Frenetic, Under-Challenged, and Worn-out)*

Variables	Burnout Total		Frenetic		Under-challenged		Worn out	
	Median (IQR)	p-value	Median (IQR)	p-value	Median (IQR)	p-value	Median (IQR)	p-value
Medical school								
Rawalpindi Medical University	45(35-52)	0.295	17(13-21)	0.152	16(12-19)	0.471	12(9.75-15)	0.881
Shifa College of Medicine	43(36-50)		15(9.25-21.75)		14.5(10-20)		12(9-16)	
Gender								
Male	42.5(33-50)	0.01	15(11-21)	0.009	14(11-19)	0.092	12(8-14)	0.016
Female	46(39-53)		17.5(14-21)		16(12-19)		12(11-16)	
Marital status								
Single	45(38-52)	0.291	17(12-21)	0.209	16(12-19)	0.436	12(9-16)	0.598
Married	38(36-44)		14(12-15)		12(8-19)		13(12-15)	
Year of study								
Second year	43(38-49.5)	0.657	16(12-20)	0.103	14(12-19.5)	0.923	12(10-15.5)	0.466
Third year	46(39-51)		18(15-21)		16(12-18)		12(9-13)	
Fourth year	46(37-54)		17(12-22.5)		16(12-19)		12(9-16)	
Final Year	44.5(38-53)		16.5(12-21)		16(12-19)		12(10-16)	
Exam frequency								
3-6 weeks	45.5(38-52.5)	0.191	17(13-21)	0.042	16(12-19)	0.07	12(9-15)	0.441
3 months	40(31-45)		14.5(9-20)		11.5(8-19)		13(10-16)	
6 months	41.5(39.5-48)		11(8-14.5)		19(16-21.5)		15(10.5-17)	

Residence								
Day scholar	45(38-52)	0.566	17(12-21)	0.852	16(12-19)	0.435	12(10-15)	0.842
Hostellite	43(37-54)		11(8-14.5)		16(11-18)		12(8-16)	
Financial status								
Low income	44.5(43-49)		18(8-20)		16(10-18)		12.5(9-13)	
Middle income	47(39-54)	0.247	18(13-21)	0.475	16(12-20)	0.217	12(10-16)	0.669
High income	44(37-52)		16(12-21)		15(12-18.5)		12(9-15)	
Sleeping hours								
>6 hours	43(36-50.5)	<	16(12-20)	<	15(12-18)	0.023	12(9-15)	0.434
<6 hours	46(40-54)	0.001	19(15-22)	0.001	16(12-20)		12(10-16)	
Workout frequency								
No workout	45(39-53)		17(13-21)		16(12-18)		12(10-16)	
>3 times a week	41(32-49)	0.009	15(11-20)	0.017	14(12-19)	0.559	11(8-12)	< 0.001
<3 times a week	46(38-53)		18(12-22)		16(11-12)		12(12-16)	

Note. Overload represents frenetic, lack of development represents under-challenged, and neglect represents a worn-out subtype of burnout.

Table 4 shows Spearman's Rank Correlation Analysis between BEIS-10 scores and Total BCSQ12SS and BCSQ12SS subtype scores. A weak positive correlation exists between BEIS-10 scores and Frenetic type of burnout (r= 0.227, p= 0.000019) & Lack of Development type of burnout (r=0.179, p=0.000752), meaning higher Emotional Intelligence leads to higher burnout in that dimension, but the weak correlation indicates other contributing factors might exist. A weak negative correlation exists between BEIS-10 scores and Neglect type of burnout (r = -0.122, p = 0.022) & Total BCSQ12SS scores (r = 0.127, p = 0.017), indicating that higher Emotional Intelligence leads to lower burnout in that domain, but the weak correlation suggests other factors may be at play.

Table 4 *Correlation Between Burnout Subtypes and Emotional Intelligence*

Burnout Dimension	Spearman's Correlation with EI	Significance (p-value)	Strength & Direction
Overload	0.227	<0.001	Weak Positive (Significant)
Lack of Development	0.179	<0.001	Weak Positive (Significant)
Neglect	-0.122	0.022	Weak Negative (Significant)
Total burnout	0.127	0.017	Weak Positive (Significant)

Note. Overload represents a frenetic, lack of development represents under-challenged, and neglect represents a worn-out subtype of burnout, while EI represents emotional intelligence.

Discussion

Burnout is characterized by a profound depletion of motivation and incentive, emerging when desired outcomes remain elusive despite sustained dedication to a specific purpose.[13]

Chronic stress from burnout can lead to significant issues for those in high-pressure jobs, including deep fatigue, a sense of detachment from their work, and the feeling that their efforts are not paying off.[14] To find out who is most likely to get burnout, which groups are at risk, and the best ways to prevent it, the construct of burnout has been closely studied to see its connection with emotional intelligence. [15, 16]

Our study was conducted among students at Rawalpindi Medical University and Shifa College of Medicine. It investigated the prevalence of burnout and its relationship with Emotional Intelligence (EI) in students enrolled in an Integrated Modular Curriculum. Our study included 350 students, with 318 of them being from Rawalpindi Medical University*)* and 32 from Shifa College of Medicine*)*. The BCSQ dimensions analysis revealed varying levels of burnout subtypes, with the Overload dimension showing a mean score of 16.85 (SD = 5.87). It is interesting to note that the Overload subtype represents the "frenetic" profile, characterized by ambitious and committed individuals showing dedication to work. Medical students often show this burnout pattern due to the demanding nature of their curriculum, which requires extensive time commitment and lacks sufficient breaks.

The findings also revealed moderate levels of emotional intelligence among the overall cohort, with a mean BEIS-10 score of 36.35 (SD = 6.34). Interestingly, our analysis revealed no statistically significant difference between the emotional intelligence of students of different institutions or different demographic groups. This contrasts with some previous findings that suggest the influence of institutional and demographic factors on the emotional intelligence of medical students.[17] This may be due to a lack of sufficient impact of the difference in environment and curriculum on the emotional intelligence of the overall study population.

Sleep deprivation and low physical activity were strongly associated with higher burnout in our sample. Students sleeping <6 hours per night or living a sedentary life (no exercise routine) had significantly higher burnout scores. This is in line with previously conducted studies showing a significant association between pathological sleepiness and inadequate sleep, with a higher prevalence of burnout. [18,19]

A key finding of our study is the significant positive correlation between burnout (measured by BCSQ) and emotional intelligence (measured by BEIS-10), indicating a complex relationship between burnout manifestations and emotional competencies. Even though previously published research showed a negative correlation between burnout

and emotional intelligence levels, the finding in our study can be explained by the inability of the students to cope with the rapidly changing curriculum and vastly diversified educational demands in the medical schools, resulting in the inability of students to cope with stress and thus experience burnout despite moderate or high emotional intelligence.

Our results highlight the need for targeted interventions to build emotional intelligence and resilience among medical students, as an integrated curriculum alone fails to serve that purpose. While integrated curriculum offers better and engaging learning experiences, our data shows that students still show moderate emotional intelligence, indicating that this system needs improvement and dedicated training focused on developing emotional skills of students, such as stress management workshops, mentorship, and counselling, are needed to support the students and develop emotional resilience in them, helping them to mitigate burnout effectively.

Previously conducted research into burnout associated with integrated modular curricula identified several factors influencing these variables, including excessive workload, sleep deprivation, and financial issues. According to a study, low family income, and sleep deprivation were strongly correlated with burnout in medical students following an integrated modular curriculum. [10]

The teaching strategies employed in the integrated modular system predominantly utilize an active, student-centered approach that involves self-directed learning and small group discussions. Although these methods are designed to enhance student motivation and reduce anxiety, there may be problems in their implementation, and the factors responsible for these issues remain a topic of future research. The present findings indicate that further intervention may be required to nurture emotional intelligence effectively.

The cross-sectional design of our study restricts causal inferences regarding the correlation between burnout and emotional intelligence. Longitudinal research would help trace temporal changes in both variables and form more conclusive causal relations. Self-report measures are also prone to social desirability bias and do not completely reflect the multifaceted character of burnout and emotional intelligence.

Burnout is a complex phenomenon with a multitude of factors that can affect it. There are likely other important variables influencing the relationship between emotional intelligence and burnout among medical students that were not captured in this study. Factors such as personality traits, coping mechanisms, social support, and specific curriculum-related elements, which could not be evaluated in our study, can play a significant role in altering the relationship between the two variables under study. This can be a topic of further research, which can help determine the potential factors influencing the complex association between burnout and emotional intelligence.

The following 4th Year MBBS students of Rawalpindi Medical University of IUGRC Research Batch K helped us in conducting this study: Muhammad Mairaj Umar, Dua Fatima, Zainab Waqar, Laiba Rashid, Noor ul Huda, Komal Zahra, Taimoon Rasheed, Isha Anees, Sneha Sohail, Fazeen Arif, Talha Bilal, Kashaf Imran, Filza Usman, Ayza Tariq, Momina Siddique, and Irsah Qamar.

Conclusion

This study explored the relationship between burnout and emotional intelligence (EI) among medical students enrolled in an integrated modular curriculum at two institutions. In conclusion, the findings highlight a notable prevalence of the "frenetic" Overload subtype of burnout, despite moderate to high levels of emotional intelligence, which showed no significant differences across institutions or demographic groups.

These results suggest that while curricular structure plays an important role, it may not be sufficient on its own for the development of emotional resilience. Therefore, targeted interventions beyond curriculum design—such as emotional skills training, stress management workshops, and better support systems—may be necessary to support students' mental well-being.

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