

Burnout among Medical and Dental Students: Prevalence, Determinants, and Coping Mechanisms

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ABSTRACT

Objective: To assess the burnout and resilience scores among medical and dental students and to identify the factors that affect burnout and resilience of the students.

Study Design: Descriptive cross-sectional study.

Place and Duration of the Study: Bahria University Health Sciences, Karachi, Pakistan, from March to September 2023.

Methodology: A calculated sample of 392 students participated in this cross-sectional study. In which students self-administered the Burnout Assessment Test (BAT-23) and Brief Resilience Scale (BRS) questionnaire. Descriptive statistics were determined using frequency and percentages and multiple regression analysis.

Results: The mean age of the students was 21.6 ± 1.6 years predominantly females from a medical college, studying in clinical years, and residing in hostels or rented flats. The total burnout was 38%, out of which academic burnout was 80%. Among the four burnout categories, most of the students experienced exhaustion (87.5%) followed by cognitive impairment. The brief resilience score was high which assessed the coping mechanism, and 74.5% of the students had normal resilience. Medical students in clinical years living with a family, spending few hours on social media, having financial difficulties, and having lower resilience are all associated with a slightly higher burnout score.

Conclusion: The students displayed elevated brief resilience scores, signifying proficient coping strategies despite high academic burnout frequency. Exhaustion was the most widespread in the burnout categories, and factors linked to a slightly increased burnout score encompassed being a medical student in clinical years, living with family, dedicating more time to social media, encountering financial challenges, and possessing lower resilience.

Key Words: Burnout, Resilience, Medical students, Exhaustion.

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INTRODUCTION

Burnout is now recognised as a significant health issue by the World Health Organization (WHO), classified as a syndrome resulting from chronic workplace stress according to the International Classification of Diseases. This definition has spurred a global conversation on the broader impact of professional and academic stress on mental health, highlighting the need for further research into its implications for the global disease burden.¹ Medical and dental students, in particular, experience higher levels of burnout compared to their peers. Studies reveal burnout prevalence ranging from 14.9 to 57.7% among medical students, with contributing factors including prolonged academic demands, stress, lack of control, and insufficient support systems.

Students are particularly vulnerable due to the high levels of stress and challenges they face during their academic journey, leading to exhaustion, cynicism, and feelings of inadequacy.²⁻⁴

The academic pressures faced by medical and dental students are exacerbated by the demanding nature of the healthcare field, which is rapidly evolving and requires constant adaptation. Research indicates that resilience, defined as the ability to manage obstacles and setbacks, is a critical protective factor against burnout. Coping mechanisms such as problem-solving, cognitive restructuring, and seeking social support have been shown to mitigate fatigue and cynicism while improving efficacy.^{5,6}

Studies conducted globally, including USA, Brazil, and Saudi Arabia, have explored the relationship between burnout, academic performance, and resilience. For instance, medical students with extreme GPAs or in the early stages of their academic careers are more likely to experience burnout.⁷⁻¹⁰ However, despite the high levels of stress associated with medical training, insufficient attention has been paid to resilience and coping mechanisms as protective factors.^{1,4,5}

In response to this gap, the present study seeks to assess burnout and resilience levels among medical and dental students at a

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private university in Karachi, to identify key factors contributing to these outcomes, and offers insights into potential interventions for improving students' well-being.

METHODOLOGY

In this cross-sectional study, the participants were medical and dental students of the Bahria University Health Sciences, Karachi, Pakistan. A sample size of 371 was calculated using OpenEpi version 3.0, by considering the total population of students as 1100 and an expected frequency as 30%,¹¹ and 95% confidence level. However, 5% of extra students were selected to address missing data or incomplete survey submissions. All the undergraduate medical and dental students, regardless of gender preference, were included in the survey when they were present on that particular day. However, all the postgraduate scholars and undergraduate students from Allied Health Science College were excluded from the sampling.

Every third student was selected from a classroom session; the rest were asked to leave the class, and they were given a link to follow to get the Google form for the survey and respond to the questions accordingly. The questionnaire consisted of sociodemographic and study-related characteristics. In addition, the standard burnout (BAT23) scale was used. This scale is widely used and exhibited strong validity evidence, affirming its suitability for evaluating and comparing burnout levels within various populations¹² and resilience (BRS) scales to measure resilience, focusing on recovering from stress and adversity. BAT is the latest tool for assessing burnout that addresses most shortcomings of earlier tools while maintaining reliability and validity with other burnout measures such as the Maslach Burnout Inventory (MBI). This tool has been used in the authors' hospital's population before.¹³ The content validity of the instrument was done by a team of subject professionals including the Department of Community Medicine, Medicine, and Psychiatrists. Responses were rated on a 5-point Likert scale from strongly disagree to strongly agree.^{14,15} The questionnaires were translated into Urdu and illustrated with the English version. A pre-testing followed by some modifications was made without changing the standard questionnaires. The data were converted and analysed through SPSS version 25. The data were cleaned, and scale scores were categorised into different levels according to the recommended guidelines.¹⁶ The data was illustrated as frequencies, proportions, means, and standard deviations. A regression model was developed considering the overall burnout as the dependent variable. Regression models for each thematic area (dimension) of burnout were also created, including resilience; however, these results were not reported separately, as they were similar to the findings observed through the overall burnout categories. A p-value of <0.05 was considered significant. The survey was conducted after seeking formal approval from the Institutional Review Board of the University Hospital. A consent form developed in English along with its translation was also used to seek permission and ensure confidentiality from the students who were included in the online questionnaire.

RESULTS

The study population included 392 respondents with a mean age of 21.6 ± 1.6 years. The students were predominantly females 243 (62%), corresponding with the admission trend. Mainly 293 (74.74%) participants were from medical college, and 274 (69.89%) were studying in clinical years (i.e., from 3rd to final year, respectively). Most of the students 270 (69%) were living in hostels or rented flats with friends. The distribution of study hours and time spent on social media was the same. However, 298 (76.0%) thought they have/had burnout due to academic requirements and expectations. Taking anti-anxiety/depression medicines was affirmed by 68 (17%) of students (Table I).

This study's BAT-23 (BAT-Burnout Assessment Test) scale further categorises it into four thematic areas. They are exhaustion, mental distance, cognitive impairment, and emotional impairment. Table II shows that 80% of the students had academic burnout; 38% (148) had high total burnout scores. Among the four categories, most students 343 (87.5%) experienced exhaustion, followed by cognitive impairment in terms of occurrence. The 'Brief Resilience Score (BRS) scale assessed the results of coping mechanisms; 74.5% (281) had normal resilience.

Table I: Frequency distribution of socio-demographic and study-related characteristics (n = 392).

Sociodemographic characteristics	n (%)
Age in years	21.6 ± 1.6 years Median 22 years
Age groups	
20 or less years	96 (24.48%)
21 - 22 years	175 (44.64%)
23 + years	121 (30.86%)
Gender	
Male	149 (38%)
Female	243 (62.0%)
Educational college	
MBBS	293 (74.74%)
BDS	99 (25.25%)
Clinical / non-clinical groups	
Pre-clinical	118 (30.1%)
Clinical	274 (69.89%)
Marital status	
Single	352 (89.8%)
Not single	40 (10.2%)
Residence type	
Staying with a family	122 (31.1%)
Staying without a family (mostly hostel)	270 (68.9%)
Study-related characteristics	n (%)
Study hours per week	
Five or less hours	198 (50.51%)
6-15 hours	134 (34.18%)
16 hours or more	60 (15.30%)
Hours spent on social media per week	
Less than 3 hours	199 (50.8%)
3 hours or more	193 (49.2%)
Subjective burnout experience	
Yes	298 (76.0)
No	94 (24.0)
Had financial difficulties in the past	
Yes	127 (32.4%)
No	265 (67.6%)
Taking anti-anxiety or anti-depressant medicines	
Yes	68 (17.3%)
No	324 (82.7%)

Table II: Frequency distribution of levels of burnout based on "Burnout Assessment Test-23" (BAT-23) and the suggested standards.

BAT-23	Physical exhaustion	Mental distance	Cognitive impairment	Emotional impairment	Total score (Comprehensive BAT)	Resilience based on Brief Resilience Scores (BRS)
Low n (%)	49 (12.5)	110 (28.1)	85 (22.4)	110 (28.1)	77 (19.6)	96 (25.5)
Average n (%)	124 (31.6)	158 (40.3)	137 (34.9)	145 (37.0)	167 (42.6)	NORMAL-for BRS 281 (74.5)
High + n (%)	219 (55.9)	124 (31.8)	167 (42.6)	137 (34.9)	148 (37.8)	

Table III: Regression model illustrating the finding for burnout score levels with the various independent factors.

Predictors	Coefficient	Standard error	Z value (ward statistics)	p-value	Odds ratio	95% CI (lower)	95% CI (upper)
Gender	0.06 (male)	0.342	8.427	0.004**	1.03	0.5	2.005
Education	0.130	0.379	0.118	0.731	1.139	0.54	2.397
	MBBS						
Age groups	-1.233	0.592	4.338	0.037**	0.291	0.091	0.930
	Younger						
Clinical/non-clinical groups	0.079	0.453	0.030	0.861	1.08	0.445	2.632
	Clinical group						
Residence	0.223	0.356	0.392	0.531	1.250	0.622	3.51
	With family						
Marital status	-0.121	0.503	0.058	0.809	0.886	0.330	2.374
	Single						
Study hours	-0.287	0.439	0.428	0.513	0.637	0.260	1.559
	Lesser study hours						
Hours spent on social media	0.094	0.310	0.093	0.761	1.098	0.598	2.019
	Lesser hours						
Taking anti-anxiety medicines	-1.716	0.561	9.382	0.002**	0.18	0.06	0.540
	Not taking						
History and burnout	-0.049	0.351	0.019	0.669	0.952	0.479	1.89
Financial difficulties	0.056	0.338	0.028	0.867	0.058	0.545	2.05
	Yes						
Resilience level	0.208	0.353	0.028	0.867	1.058	0.546	2.01
	Low resilience						

Table III provides the results of a regression model that illustrates the relationship between burnout score levels and various independent factors. Having an MBBS education (medical as opposed to Dental), being in clinical years, living with a family, spending few hours on social media, having financial difficulties, and having lower resilience are all associated with a slightly higher burnout score. However, the p-value of less than 0.05 indicates statistical insignificance. Factors such as being single, studying for a few hours, and a history of burnout were associated with lower burnout levels but did not reach statistical significance. However, it was noted that male gender was associated with a slightly higher burnout score with a significance ($p = 0.004$). Interestingly, being in the younger age group and not taking anti-anxiety agents is associated with lower burnout scores with statistical significance ($p = 0.002$). The regression analysis also revealed that the pseudo-R square value for burnout as a whole is 0.14, which means that the independent variables included in the model explain 14% of the variance in burnout. The pseudo R-square values for each component of burnout ranged from 0.04 to 0.11, indicating that the independent variables explain between 4% and 11% of the variance in each component.

DISCUSSION

The primary objective of the present study was to enhance the understanding of burnout among medical and dental students. This was achieved by investigating various factors, including exam-related stress, study hours, social media usage, the use of anti-depressants, familial pressure, and

personal aspirations. Additionally, the study assesses the efficacy of coping strategies employed by students to mitigate burnout and enhance their resilience.

In this study, about 80% of the students had academic burnout; 38% had high total burnout scores. This aligns with the findings from various studies examining burnout levels among medical students. For example, a study conducted on Swedish medical students by Dahlin *et al.* revealed elevated burnout levels in 47% of the participants.¹⁷ Similarly, Dyrbye *et al.* identified a burnout incidence of 45% among medical students in Minnesota.¹⁸ Conversely, Mazurkiewicz *et al.* reported even higher burnout levels (71%) among third-year medical students at Mount Sinai School of Medicine in New York.⁶

In this study, medical students showed more burnout than dental students. A study conducted by Mohammad *et al.* revealed that moderate-to-high levels of burnout were seen with no significant difference observed between medical and dental students in all the burnout categories. This divergence could be indicative of the distinct characteristics of education in each country and the educational institution.¹⁹

In this study, about 76% of the students thought, they have/had burnout due to academic requirements and expectations from their parents. Similarly, a study conducted by Muzafar *et al.* discovered a multitude of stressors among medical students, with a predominant focus on academic-related challenges. Hence, the elevated expectations from parents and the heightened stress associated with meeting

these expectations could potentially contribute to the increased prevalence of burnout among medical students.¹¹

Upon individual evaluation of each dimension of burnout, medical students at the University of Bahria exhibited notable percentages of exhaustion followed by cognitive impairment. Similar results were noted in other studies, where there were reports of elevated rates of exhaustion.^{20,21}

However, in the present study, it was noted that male gender was associated with a slightly higher Burnout score. Similar results were observed in Irena Illic *et al.* study on the high risk of burnout in medical students in Serbia, by gender, revealing that male students were at higher risk of developing burnout syndrome.²²

The high resilience and high burnout in this study is a unique finding. This is different from studies conducted in China, which revealed that academic burnout was positively predicted by both stress and resilience.¹⁴ Resilience-based interventions may be promising in buffering the negative impacts of academic burnout and improving life satisfaction.¹⁵ However, this study reported that 74.5% of the students had normal resilience, which demonstrated that they had good coping mechanisms, but the students still had burnout.

This is the first study as opposed to many other studies in Pakistan, which has shown a relatively higher level of burnout. This trend has been demonstrated in the Western population and some Arab students as opposed to Asians. This brings a new pattern of the students and the social life patterns among the students. This finding necessitates further qualitative or mixed-method studies. It may be further studied if the scale variation makes a difference in burnout outcomes. These students demonstrated a good resilience score, indicating good coping mechanisms despite a higher level of burnout. The higher physical exhaustion may suggest that these young students, mostly from higher socio-economic classes and mostly girls, are not prepared for the untiring demands of medical studies. This needs further probing.

The limitation of this study is that it is a single-centre study, so the study results cannot be generalisable to the population. Another limitation is the non-probability convenient sample of the students due to the online approach.

CONCLUSION

The overall burnout rate was 38%, with academic burnout accounting for 80%. Among the burnout categories, exhaustion was the most prevalent at 87.5%, followed by cognitive impairment. Surprisingly, despite burnout, the students exhibited high-brief resilience scores, indicating effective coping mechanisms and 74.5% demonstrated normal resilience levels. Factors associated with a slightly higher burnout score included being a medical student in clinical

years, living with family, spending more time on social media, facing financial difficulties, and having lower resilience.

ETHICAL APPROVAL:

This study was approved by the Institutional Review Board of the Bahria University Health Sciences, Karachi (Approval No. BUHS-IRB # 011/23).

PARTICIPANTS' CONSENT:

Informed consent was obtained from all the participants included in the study.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

SB: Conception or design and critical revision of the manuscript for important intellectual content.

IHT: Conception, analysis, and interpretation of the data.

FNE: Drafting of the manuscript and critical revision for important intellectual content.

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REFERENCES

1. Atroszko PA, Demetrovics Z, Griffiths MD. Work addiction, obsessive-compulsive personality disorder, burn-out, and global burden of disease: Implications from the ICD-11. *Int J Environ Res Public Health* 2020; **17(2)**:660. doi: 10.3390/ijerph17020660.
2. Kumaresan A, Suganthirababu P, Srinivasan V, Vijay Chandhini Y, Divyalaxmi P, Alagesan J. *et al.* Prevalence of burnout syndrome among work-from-home IT professionals during the COVID-19 pandemic. *Work* 2022; **71(2)**:379-84. doi: 10.3233/WOR-211040.
3. Rojas MCC, Maggia JAU, Loayza EIL. Prevalence of burnout syndrome in military personnel at the National Geographic Institute of Peru. *Enferm Glob* 2022; **21(2)**:436-46. doi: 10.6018/eglobal.48928.1
4. Bahlaq M, Ramadan I, Abalkhail B, Mirza A, Ahmed M, Alrad-dadi K, *et al.* Burnout, stress, and stimulant abuse among medical and dental students in the western region of Saudi Arabia: An analytical study. *Saudi J Med Med Sci* 2023; **11(1)**:44-53. doi: 10.4103/sjmms.sjmms_98_22.
5. Semu E. Reducing college student burnout: Predictive factors, harmful effects, and preventative strategies. *Intuit BYU Undergrad J Psychol* 2020; **15(2)**:95-108.
6. Mazurkiewicz R, Korenstein D, Fallar R, Ripp J. The prevalence and correlations of medical student burnout in the pre-clinical years: A cross-sectional study. *Psychol Heal Med* 2012; **17(2)**:188-95. doi: 10.1080/13548506.2011.597770.
7. Haile YG, Senkute AL, Alemu BT, Bedane DM, Kebede KB. Prevalence and associated factors of burnout among Debre Berhan University medical students: A cross-sectional study. *BMC Med Educ* 2019; **19(1)**:413. doi: 10.1186/s12909-019-1864-8.
8. Irshad K, Ashraf I, Azam F, Shaheen A. Burnout prevalence and associated factors in medical students in integrated

- modular curriculum: A cross-sectional study. *Pak J Med Sci* 2022; **38(4Part-II)**:801-6. doi: 10.12669/pjms.38.4.5052.
9. Alsharif M, Almadani N, Mahmoud RY, Alsharif A, Al-Maweri SA, Kassim S. Impact of resilience and environmental stress on burnout of students in public and private dental schools in western Saudi Arabia. *Niger J Clin Pract* 2023; **26(2)**: 162-8. doi: 10.4103/njcp.njcp_35_22.
 10. Vidhukumar K, Hamza M. Prevalence and correlates of burnout among undergraduate medical students - A cross-sectional survey. *Indian J Psychol Med* 2020; **42(2)**:122-7. doi: 10.4103/IJPSYM.IJPSYM_192_19.
 11. Muzafar Y, Khan HH, Ashraf H, Hussain W, Sajid H, Tahir M, et al. Burnout and its associated factors in medical students of Lahore, *Pakistan. Cureus* 2015; **7(11)**:e390. doi: 10.7759/cureus.390.
 12. Sinval J, Vazquez ACS, Hutz CS, Schaufeli WB, Silva S. Burnout Assessment Tool (BAT): Validity evidence from Brazil and Portugal. *Int J Environ Res Public Health* 2022; **19(3)**:1344. doi: 10.3390/ijerph19031344.
 13. Khan S, Shahid N, Hassan M. Assessment of level of burnout among health professionals in Lahore, *Pakistan. JBUMDC* 2024; **14(2)**:133-8 doi: 10.51985/JBUMDC2023305.
 14. Kyriazos TA, Stalikas A, Prassa K, Galanakis M, Yotsidi V, Lakioti A. Psychometric evidence of the Brief Resilience Scale (BRS) and modeling distinctiveness of resilience from depression and stress. *Psychology* 2018; **09(7)**: 1828-57. doi: 10.4236/psych.2018.97107.
 15. Liu Y, Cao Z. The impact of social support and stress on academic burnout among medical students in online learning: The mediating role of resilience. *Front Public Heal* 2022; **10**:938132. doi: 10.3389/fpubh.2022.938132.
 16. Wang Q, Sun W, Wu H. Associations between academic burnout, resilience and life satisfaction among medical students: A three-wave longitudinal study. *BMC Med Educ* 2022; **22(1)**:248. doi: 10.1186/s12909-022-03326-6.
 17. Dahlin ME, Runeson B. Burnout and psychiatric morbidity among medical students entering clinical training: A three year prospective questionnaire and interview-based study. *BMC Med Educ* 2007; **7**:6. doi: 10.1186/1472-6920-7-6.
 18. Dyrbye LN, Thomas MR, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, et al. Personal life events and medical student burnout: A multicenter study. *Acad Med* 2006; **81(4)**: 374-84. doi: 10.1097/00001888-200604000-00010.
 19. Mohammad Z, Khalaf A, Mohammed A, Ali A, Abdulmajeed Z, Moayad Z. Comparative assessment of burnout syndrome in medical and dental senior undergraduate students. *Arch Clin Psychiatry* 2021; **48(4)**:203-7. doi: 10.15761/0101-60830000000308.
 20. Costa EF, Santos SA, Santos AT, Melo EV, Andrade TM. Burnout syndrome and associated factors among medical students: A cross-sectional study. *Clinics* 2012; **67(6)**: 573-80. doi: 10.6061/clinics/2012(06)05.
 21. Yahya MS, Abutiheen AA, Al-Haidary AF. Burnout among medical students of the University of Kerbala and its correlates. *Middle East Curr Psychiatry* 2021; **28**:78. doi: 10.1186/s43045-021-00152-2.
 22. Ilic I, Macuzic IZ, Kocic S, Ilic M. High risk of burnout in medical students in Serbia, by gender: A cross-sectional study. *PLoS One* 2021; **16(8)**:e0256446. doi: 10.1371/journal.pone.0256446.

