

# Burnout Among Healthcare Students In Punjab, Pakistan: A Cross-Sectional Study

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## Abstract

**Background:** Healthcare students experience multiple stressors, including heavy workloads, early exposure to illness and death, and financial pressures. These stressors can contribute to negative outcomes such as substance misuse, reduced empathy, suicidal ideation, and burnout.

**Objectives:** This study aimed to assess burnout levels across multiple healthcare programs, considering demographic factors such as age, gender, program, and year of study, to provide a broader understanding of the issue.

**Materials and Methods:** The study was quantitative, cross-sectional in nature, using a modified Maslach Burnout Inventory (MBI). The study was done from September to October 2024, with participants from 66 institutes across Punjab. The sampling technique was convenience sampling. The questionnaire was circulated online and in-person by the authors and then the data were analysed using SPSS version 26.0 (IBM Corp., Armonk, NY) and chi-square test was applied.

**Result:** The study included a total of 422 valid responses from healthcare students. The results show that gender, sector of institute, and residence have insignificant correlation with burnout ( $p > 0.05$ ), whereas, age groups, programs students are enrolled in, and years of study have significant correlation ( $p < 0.05$ ).

**Conclusions:** This study provides insight into the prevalence of burnout among Pakistani healthcare students and highlights how factors such as age, program, and year of study influence stress levels, offering a basis for targeted interventions and informing future research to develop strategies for prevention and support.

**Keywords:** Student; Healthcare; Maslach Burnout Inventory; Medical education; Mental health; Punjab, Pakistan; Stress.

## Introduction

Healthcare students face significant stress due to demanding coursework, exposure to death and illness, career uncertainty, financial pressures, and requirement to absorb great deal of information over short timespans.<sup>1,2</sup> These factors can lead to deteriorating mental health, especially during critical developmental stage as these students are often stepping into adulthood and combating life changes alongside their education.<sup>1,3,4</sup> Lack of control over schedules and learning environments contribute to feelings of helplessness and burnout. Long hours and sleep deprivation further exacerbate these challenges.<sup>5</sup>

Burn-out is defined in the 11<sup>th</sup> Revision of International Classification of Diseases (ICD-11) as ‘a syndrome, resulting from chronic unmanaged workplace stress’. It is characterized by three dimensions: emotional exhaustion; depersonalization; and lack of personal achieve-

ment.<sup>6</sup> In healthcare sector, research shows large burden of profession-related burnout among medical students.<sup>7</sup> Approximately 50% of students experience burnout and 10% experience suicidal ideation.<sup>8</sup> Previous studies have reported burnout prevalence as high as 75.2% among healthcare students.<sup>9</sup>

Healthcare students, including those in medicine, dentistry, nursing, pharmacy, and physiotherapy, are particularly vulnerable to high stress levels and burnout due to demanding nature of their studies.<sup>10</sup> Burnout in healthcare students can lead to academic dishonesty, reduced altruism, alcohol misuse, workforce inefficiency, lower academic performance<sup>11</sup>, and suicidal ideation.<sup>8</sup> A Mayo Clinic study estimated that burnout costs U.S. healthcare system the equivalent of seven medical school graduating classes in lost productivity.<sup>12,13</sup>

If left unaddressed, burnout in healthcare can lead to grave consequences, including increased rates of depression and decreased empathy<sup>14,15</sup>, substance abuse, divorce, and even suicide. It can also affect professional functioning, contributing to medical errors, patient dissatisfaction, strained coworker relationships, and physician attrition.<sup>14,16</sup>

A global review of 114 studies involving 31,210 postgraduate medical trainees found that burnout prevalence among them is around 47.3%.<sup>17</sup> In Pakistan, studies suggest similar rates.<sup>4</sup> With most re-

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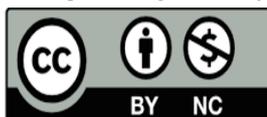
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search focusing on medical students, a need to investigate burnout in other healthcare departments was created. Understanding and addressing burnout in this population is crucial for the well-being of students and quality of patient care, as there remains a gap in exploring burnout across other healthcare disciplines.<sup>18</sup>

Punjab was chosen as the focus of this study because global data may not accurately represent stressors unique to this region. Furthermore, there is a scarcity of studies investigating burnout among healthcare students in Pakistan, and, to the best of our knowledge, no study has examined burnout across all major healthcare departments in this region. Therefore, the purpose of this study is to investigate the prevalence of burnout and its associated factors among healthcare students in Punjab.

## Material and Methods

This study involved healthcare students (Medicine, Dentistry, Nursing, Pharmacy, and Physiotherapy) enrolled in institutes across Punjab. A minimum sample size of 387 was calculated at a 95% confidence level<sup>19</sup>, and a total of 422 valid responses were ultimately obtained. Students from departments other than those listed and/or from institutions outside Punjab were excluded.

Data collection was conducted in September and October 2024, adhering to the Helsinki Declaration guidelines.<sup>20</sup> The study received approval from the Institutional Review Board/Ethics Review Committee (IRB/ERC) under approval number **900/IMC/ERC/000109**. Participants completed a questionnaire, either online or on paper, after providing informed consent. Burnout was assessed using a modified version of Maslach Burnout Inventory (MBI)<sup>21</sup>, a well-established tool for measuring burnout. The MBI was originally designed for workplace settings. We modified its wording to reflect healthcare students' academic and clinical experiences, preserving its core dimensions (emotional exhaustion, depersonalization, personal achievement) to ensure relevance and validity for this population, while acknowledging this may limit direct comparability with the original tool. Responses were rated on a 6-point scale (0 corresponding to "never" and 5 to "daily").

Data was entered and analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY). Frequency distributions were calculated for demographic data, and the association of burnout with demographics was assessed using chi-square tests. A p-value of 0.05 or less was considered significant. Burnout levels were classified as low, moderate, and high, based on percentile cut-offs of the original MBI, as there were no established cut-offs for the region.

## Results

A total of 422 respondents participated in this study, majority (n=236, 55.9%) being females. Participants were from Medicine, Dentistry, Nursing, Pharmacy, and Physiotherapy programs, studying at 66 institutes. Overall, majority of participants were from private

sector institutes (n=328, 77.7%) and among residences, majority were day scholars (n=245, 58.1%), as seen in the following Table .

Regarding emotional exhaustion (EE), females and males reported similar high and moderate levels (Table II). For depersonalization (DP), more percentage of males had higher levels of burnout (54.3% vs. 44.5%). In lack of personal achievement (PA) dimension, males, again, had significantly higher percentage of high burnout (74.2% vs. 67.8%). The detailed breakdown is given in Table II.

**Table I: Frequencies of Demographics**

Demographic	Frequency	Percent
<b>Gender</b>		
Females	236	55.9
Males	186	44.1
<b>Ages</b>		
17	2	0.5
18	16	3.8
19	58	13.7
20	84	19.9
21	77	18.2
22	68	16.1
23	67	15.8
24	27	6.4
25	10	2.4
26	6	1.4
27	5	1.2
28	1	0.2
29	1	0.2
30	1	0.2
<b>Sector</b>		
Private Sector	328	77.7
Public Sector (Government)	94	22.3
<b>Residence</b>		
Day Scholar	245	58.1
Hostelers	177	41.9

Burnout levels were determined by combining scores from the three dimensions. Burnout levels were determined by combining scores from the three MBI dimensions, as high scores in multiple dimensions better reflect the overall severity of burnout than any single dimension alone. Individuals with high scores in one dimension were considered "Level 1 Burnout," two dimensions were "Level 2," and three dimensions were "Level 3." Those with low and/or moderate scores in all dimensions were classified as "Level 0 Burnout." Based on this classification, 16.4% (n=69) of subjects were at Level 3, 34.1% (n=144) at Level 2, similarly, 34.3% (n=145) were at Level 1 of burnout, and 15.2% (n=64) were not burnt-out. Gender, sector of institute, and residence showed no significant association with Level 3 burnout (p > 0.05)

**Table I: Frequencies of Demographics**

Study Program and Year		
Nursing First Year	19	4.5
Nursing Second Year	3	0.7
Nursing Fourth Year	1	0.2
Dentistry First Year	23	5.5
Dentistry Second Year	10	2.4
Dentistry Third Year	8	1.9
Dentistry Fourth Year	27	6.4
Physiotherapy First Year	23	5.5
Physiotherapy Second Year	5	1.2
Physiotherapy Third Year	12	2.8
Physiotherapy Fourth Year	11	2.6
Physiotherapy Final Year	12	2.8
Medicine First Year	79	18.7
Medicine Second Year	30	7.1
Medicine Third Year	33	7.8
Medicine Fourth Year	20	4.7
Medicine Final Year	24	5.7
Pharmacy First Year	2	.5
Pharmacy Second Year	13	3.1
Pharmacy Third Year	23	5.5
Pharmacy Fourth Year	22	5.2
Pharmacy Final Year	22	5.2

Among different age groups (Table III), 9.4% (n=15) students ranging from ages 17-20, 17.5% (n=37) among ages 21-23 and 24% (n=12) among the 24-30 group reported high burnout with p-value of 0.046 (<0.05). This result is statistically significant. For level of burnout between different disciplines and years of study (Table III), we see that students of Dentistry Final Year were among the most burnt-out students amounting to 12.5% (n=8) of total students at Level 3 burnout, followed by 11% (n=7) being of Medicine first year and Medicine Final Year making 9.4% (n=6) of the burnt-out students, with p-value of 0.029 (<0.05), showing that our test is statistically significant.

We also analyzed the data to find specific correlation between discipline and burnout (Table IV), and study year and burnout (Table V). The p-values for tables IV and V are 0.0004 and 0.033, respectively, which render both these tests statistically significant. As evident in table IV, considering their weightage, Dentistry had the highest percentage of Level 3 burnout with 25% (n=17) at Level 3, followed by Physiotherapy

**Table II: Frequency and Percentage of MBI Dimensions**

MBI Dimensions (scores)	Females	Males
<b>Emotional Exhaustion</b>		
Low (0-10)	92 (39.0%)	66 (35.5%)
Moderate (11-17)	75 (31.8%)	68 (36.6%)
High (18-25)	69 (29.2%)	52 (28.0%)
	236	186
<b>Depersonalization</b>		
Low (0-3)	76 (32.2%)	47 (25.3%)
Moderate (4-7)	55 (23.3%)	38 (20.4%)
High (8-25)	105 (44.5%)	101 (54.3%)
	236	186
<b>Lack of Personal Achievement</b>		
High (0-17)	160 (67.8%)	138 (74.2%)
Moderate (18-20)	39 (16.5%)	23 (12.4%)
Low (21-25)	37 (15.7%)	25 (13.4%)
	236	186

with 23.8% (n=15) and Medical with 11.8% (n=22). However, Pharmacy had the most students burnt-out, if all levels of burnout are considered, at 94% (n=77), followed by a near-tie between Dentistry and Medicine with at 83.8% (n=57) and 83.3% (n=155), respectively. For burnout by study years, as Nursing and Dentistry, in Pakistan, are four-year programs, we considered their fourth year to be the "final" and skipped their results in "Fourth Year." Doing this, we found out that final year faced the most Level 3 burnout at 24.7% (n=21), followed by fourth year with 23.3% (n=14) and second year with 13.2% (n=7). However, fourth year had the most students burnt-out, considering all levels, at 91.7% (n=55), followed by a three-way near tie between second, third, and final year, each with 84.9% (n=45), 84.6% (n=66), and 84.7% (n=72), respectively.

## Discussion

This study explores burnout profiles among Pakistani healthcare students, examining their unique predictors. Contrary to studies from Western contexts<sup>22,23</sup>, no significant gender differences in burnout among Pakistani healthcare students, suggesting potential shift in traditional gender-roles and stressors within healthcare education. Living arrangements and institutional sector did not significantly contribute to burnout, possibly due to social support networks, regardless of residence and similar academic pressures across institutions.

The p-value for age groups was significant, suggesting burnout varies across different ages. This supports research highlighting how life stage and developmental challenges influence burnout vulnerability<sup>22</sup>. Significant finding for the study program indicates that burnout differs across various healthcare disciplines. This backs research showing variations in burnout prevalence and factors across medical specialties.<sup>24</sup> Studies also theorize how burnout can manifest early

**Table III: Burnout per demographic**

Levels of Burnout	Demographic		Total	p - value		
	Gender					
	Female	Male				
0	45	24	69	0.261		
1	79	66	145			
2	81	63	144			
3	31	33	64			
	236	186	422			
Levels of Burnout	Sector		Total	p - value		
	Private	Public				
	0	56			13	69
1	114	31	145			
2	109	35	144			
3	49	15	64			
	328	94	422			
Levels of Burnout	Residence		Total	p - value		
	Day Scholar	Host elers				
	0	36			33	69
1	83	62	145			
2	93	51	144			
3	33	31	64			
	245	177	422			
Levels of Burnout	Ages			Total	p-value	
	17-20	21-23	24-30			
0	32	33	4	69	0.046	
1	61	65	19	145		
2	52	77	15	144		
3	15	37	12	64		
	160	212	50	422		
Study Program and Year	Levels of Burn-out				Total	p-value
	0	1	2	3		
Nursing First Year	4	7	8	0	19	0.029
Nursing Second Year	2	0	1	0	3	
Nursing Fourth Year	0	0	0	1	1	
Dentistry First Year	7	9	4	3	23	
Dentistry Second Year	3	3	2	2	10	
Dentistry Third Year	0	2	2	4	8	
Dentistry Fourth Year	6	5	8	8	27	
Physiotherapy First Year	4	8	9	2	23	

Physiotherapy Second Year	2	0	2	1	5	0.029
Physiotherapy Third Year	2	2	4	4	12	
Physiotherapy Fourth Year	1	3	2	5	11	
Physiotherapy Final Year	2	2	5	3	12	
Medicine First Year	16	33	23	7	79	
Medicine Second Year	3	11	11	5	30	
Medicine Third Year	6	13	13	1	33	
Medicine Fourth Year	2	10	5	3	20	
Medicine Final Year	4	10	4	6	24	
Pharmacy First Year	0	1	1	0	2	
Pharmacy Second Year	1	5	6	1	13	
Pharmacy Third Year	1	6	13	3	23	
Pharmacy Fourth Year	2	6	12	2	22	
Pharmacy Final Year	1	9	9	3	22	
	69	145	144	64	422	

**Table IV: Burnout in Discipline**

Study Program	Levels of Burnout				Total	p-value
	0	1	2	3		
Nursing	6	7	9	1	23	0.0004
Dentistry	16	19	16	17	68	
Physiotherapy	11	15	22	15	63	
Medicine	31	77	56	22	186	
Pharmacy	5	27	41	9	82	
	69	145	144	64	422	

**Table V: Burnout in Study Years**

Study Year	Levels of Burnout				Total	p-value
	0	1	2	3		
First Year	31	58	45	12	146	0.033
Second Year	8	16	22	7	53	
Third Year	12	24	32	10	78	
Fourth Year	5	21	19	14	60	
Final Year	13	26	26	21	85	
	69	145	144	64	422	

in training<sup>11</sup> and escalate in later years due to increasing academic and clinical pressures<sup>12</sup>, advocating for the need for early intervention and support. Furthermore, burnout in graduate-level healthcare students is seen to persist and increase in further training<sup>2,11,15</sup>.

In the MBI dimensions, emotional exhaustion (EE) was reported in 29.2% of females and 28% of males, indicating a similar prevalence between genders. Depersonalization (DP) was higher in males (54.3%) than females (44.5%), and lack of personal achievement (PA) was also more prevalent in males (74.2% vs. 67.8% in females). These differences were descriptive, and their statistical significance was not tested. Interestingly, males showed higher prevalence of cynicism and reduced personal achievement, which challenges the common notion that females experience greater burnout. In the cultural context of our society, traditional gender roles and expectations such as financial responsibility and societal pressure to succeed may contribute to higher burnout manifestations among men.

Our findings state that burnout is not solely determined by individual factors but is a complex array of different interacting stressors related to age, discipline, and educational stages. We adopted an intersectional lens to examine the workings of these factors in shaping burnout experiences of healthcare students. Understanding that gender is an insignificant stressor, we found that as age progresses in healthcare students, so does the percentage of level 3 burnout. This may be due to family expectations or pressure of job-hunting in increasing competition found in our society.

While burnout in healthcare sector has been documented<sup>13,11,15,16,22</sup>, there is a lack of research exploring unique experiences of healthcare students, particularly in culturally specific contexts. Absence of significant gender differences suggests a paradigm shift within the Pakistani context and challenges the prevailing assumption that gender is a universal predictor of burnout in healthcare<sup>22,23</sup>. This needs further investigation of the cultural factors at play.

By identifying specific “Burnout Trajectory Points” within our education system, this study underscores the need for targeted interventions at critical stages of students’ journeys. Future research should focus on developing and evaluating culturally sensitive programs that address evolving stressors faced by students at each educational stage.

### Limitation

The cross-sectional design limits causal inference. Convenience sampling may have reduced external validity, as the sample may not be representative of the wider student population, thereby limiting generalizability. In addition, unequal representation of participants (e.g., overrepresentation of certain academic disciplines or genders) may have introduced selection bias. Burnout was assessed through self-report, making the findings vulnerable to response and social desirability bias. Although the Maslach Burnout Inventory (MBI) is a validated tool, modifications in item wording and response format used in this study may limit comparability with studies employing the original version. Furthermore, psychosocial and academic stressors not assessed in this study may have acted as unmeasured confounders.

### Conclusion

Burnout among healthcare students in Punjab is significantly influenced by age, academic program, and year of study, with senior students and certain disciplines experiencing the highest levels. These findings highlight the need for targeted mental health support and workload management strategies for high-risk groups to reduce burnout and promote student well-being.

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1. **Abdullah Sikander:** Conceptualization of the study, study design, and overall supervision.
2. **Sana Shah:** Data collection, questionnaire administration, and coordination of participants.
3. **Ali Shahzad Mir:** Data management, validation, and critical revision of the manuscript.
4. **Syed Muhammad Junaid:** Statistical analysis and interpretation of results.
5. **Abrish Gull:** Literature review and assistance in manuscript drafting.
6. **Ayesha Pervez:** Final manuscript review and approval of the version to be published.