



## Prevalence of Academic Burnout among Medical Students Worldwide: A Systematic Review

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### Abstract

**Background:** Medical training is stressful and may negatively affect students. This study aimed to summarize and compare studies on academic burnout among medical students worldwide.

**Materials and Methods** In this systematic review, a systemic search of online databases (Medline, EMBASE, Scopus, Web of Science, and Cochrane Library, CIVILICA, and Google Scholar search engine) was conducted for relevant studies with no time limit up to December 2021. Two reviewers evaluated the quality of eligible studies and carried out the selection procedure. The quality of the information was evaluated using the STROBE positioning guidelines.

**Results:** Finally, 34 studies from 18 countries across all continents (a total of 9,199 medical students) were included in the study. The students' academic burnout across worldwide studies ranged from 8.9% (Saudi Arabia) to 91.1% (Iran). Based on the results, the highest prevalence of each dimension of the syndrome was estimated at 93.1% for emotional exhaustion, 97.2% for cynicism, and 20.7% for academic efficacy. Female medical students, relatively older students (> 30 years), those in the third year of study, and students pursuing primary care are at an increased risk for burnout.

**Conclusion:** Today, burnout is prevalent during medical training. The prevalence of academic burnout among students varied from 8.9% to 91.1% in different countries. Psychological and managerial interventions can help students with burnout. It is necessary to pay more attention to female, relatively older, and the third year medical students.

**Key Words:** Academic Burnout, Medical students, Prevalence, Worldwide.

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## 1- INTRODUCTION

Mental health is defined as the combination of psychological well-being (having a sense of purpose in life), social well-being (having a sense of belonging to a community), and emotional well-being (feeling happy, satisfied, and interested in life) (1, 2). Burnout is a state of emotional exhaustion that results from chronic stress, such as heavy homework, stress, time limit, and the lack of resources needed to perform the assigned tasks (3, 4). David (2010) defines academic burnout in students as feeling tired of doing homework and studying, having a pessimistic attitude towards education and curriculum, and feeling of academic inadequacy (5). It is a negative response to acute and severe stress, where people often feel emotionally and physically tired due to high demands beyond their ability (6).

Academic burnout has three components: emotional exhaustion (EE), cynicism (CY), and academic efficacy (AE). Emotional exhaustion refers to a feeling of emptiness and depletion of emotional resources (7); cynicism refers to negative, pessimistic, or overly reluctant responses to others (8); and academic efficacy refers to a lack of competence and a sense of inefficiency (9). Burnout has been clearly distinguished from mental illness (10), which is defined as a mental, behavioral, or emotional disorder, such as depression or anxiety (11). However, there is a known link between mental health and mental disorders as they are negatively correlated (10), and changes in mental health can predict future risk for mental illness (12).

One group that has been consistently shown to be at risk for mental illness is medical students (13-15). In two reviews, burnout was found typically higher in medical students than in the general population (16, 17). These rates are concerning, as medical students are future physicians and a valuable part of the healthcare system, and if they are unwell,

patients will suffer. People with academic burnout often experience symptoms such as apathy, inability to continue attending classes, not participating in the class activities, finding class activities meaningless, and feeling unable to learn the lessons (18). Therefore, it is necessary to pay attention to this issue and evaluate its prevalence in medical students and identify the factors affecting it and find ways to deal with academic burnout. Hence, this study aimed to summarize and compare studies on academic burnout among medical students.

## 2- MATERIALS AND METHODS

The Preferred Reporting Items for Systematic review and Meta-Analysis (PRISMA) checklist was used as the template for this review (19).

### 2-1. Eligibility criteria

Participants, interventions, comparators, and outcome (PICO) was used to formulate the review objective and inclusion criteria.

**2-1-1. Participants:** Medical students worldwide.

**2-1-2. Interventions:** The included research are non- interventional studies, so we did not have a comparison group.

**2-1-3. Comparators:** We did not have a comparison group and intervention.

**2-1-4. Outcomes:** Academic burnout.

**2-2. Included studies:** The review included studies containing any form of quantitative assessment, measurement, and evaluation of academic burnout in medical students in any country or region of the world. The inclusion criteria were: focusing on academic burnout among undergraduate university students only, published up to December 2021, written in English or Persian, exclusively using MBI-SS for diagnosis (three-dimensional

approach) (8), and published articles with full-text available.

**2-3. Exclusion criteria:** The exclusion criteria were abstracts without the full article, studies on employees or student-employee populations, studies in graduate students, use of diagnostic instruments other than the Maslach Burnout Inventory-Student Survey (MBI-SS), articles that are not written in English or Persian, review articles and meta-analyses, letters to the editor, editorials, short reports, case reports, and briefs.

#### 2-4. Information sources

A systemic search of electronic databases Medline (via PubMed), EMBASE, Scopus, Web of Science, CINAHL, and Google Scholar search engine was conducted. The search was done independently and in duplication by two reviewers, and any disagreement between the reviews was resolved by the supervisor.

#### 2-5. Search

Search words were a combination of (Burnout OR Academic Burnout) AND (Medical Students OR Students OR Internship) AND (Prevalence).

#### 2-6. Study selection

Database search was done for possible studies, study abstracts were screened for eligible studies, full-text articles were obtained and assessed, and a final list of included studies was made. This process was done independently and in duplication by two reviewers, and any disagreement was resolved by the third reviewer. References were organized and managed using EndNote software (version X8).

#### 2-7. Data collection process

A researcher form was developed and followed for each study. Two reviewers collected the data independently. The collected data were combined and compared for accuracy, and any

discrepancies were solved by a third reviewer.

#### 2-8. Risk of bias in individual studies

The risk of bias was assessed following the standard tool of STROBE (STrengthening the Reporting of Observational Studies in Epidemiology) positioning guidelines (20). It is a valuable tool to evaluate the quality of observational studies. This checklist has 22 items, scored based on the importance of each item according to the present study. The final score of the checklist was 30, and the minimum score was 15.0. The assessment was done by two reviewers independently and in duplication, and any discrepancies were resolved by the third reviewer.

### 3- RESULTS

Finally, 34 studies from 18 countries or territories, including 9,199 medical students, were selected. The main characteristics of the selected studies are summarized below:

#### 1. Iran

1. A cross-sectional study investigated burnout and general health in internship medical students of Birjand University of Medical Sciences in 2013. A total of 92 internship medical students participated in the study. The results showed that 38% of the participants had moderate to severe burnout; 23.9% scored high in EE, 28.3% in CY, and 20.7% in AE (21).

2. A cross-sectional study investigated the rate of burnout and its associated factors in medical students of Kashan University of Medical Sciences in 2008. A total of 56 medical students participated in the study. The results showed that the overall rate of burnout among medical students was 91.1% (22).

3. In a cross-sectional study investigating the relationship between burnout and aggression on 90 intern students of Shiraz

University of Medical Sciences, the results showed that the highest frequency of burnout was in the dimension of mild EE with 45.6%, and 57.7% were moderate to severe EE. A total of 50% of interns had mild burnout in the CY dimension, and 44.4% had middle and high levels. About 48.9% of interns had light AE, 20% had mild, and 24.4% had high AE (23).

**4.** In a study on 130 medical students, student burnout was compared among students of the fifth, sixth, and seventh year of Fasa University of Medical Sciences in 2013. Results showed that 61.9% of students had academic burnout (24).

**5.** In a cross-sectional and descriptive study, academic burnout, rate of depression, anxiety, stress, and their related factors were investigated in 120 undergraduate medical students at the Tehran Medical Sciences Islamic Azad University in 2017. Results showed that the prevalence of burnout was between 9.2 and 23.4% (25).

**6.** A cross-sectional study investigated the relationship between perfectionism, perceived stress, and social support with academic burnout on 200 medical students of Ahvaz University of Medical Sciences. The results showed that perceived stress and incompatibility perfectionism were positively related to academic burnout. The variables of social support and adaptive perfectionism had a significant negative relationship with academic burnout. Also, the result of the multiple regression showed that perceived stress is the best predictor of students' academic burnout (26).

**7.** In a cross-sectional study on 130 medical students of Qazvin University, Iran, the prevalence of burnout and its relationship with demographic factors among medical students during their internship were investigated. Results showed that burnout was significantly

more prevalent at the end of the internship course ( $p < 0.05$ ), and 15.4% of students suffered from burnout before the internship. The prevalence of burnout was also significantly high (43.1%) after the internship period ( $p < 0.05$ ). Detailed analysis showed that the scores of the three subscales of burnout (emotional exhaustion: 64.6%, cynicism: 63.8%, and academic efficiency: 40%) were significantly higher after the internship period compared with before the internship (27).

**8.** A cross-sectional study aimed to identify and quantify the possible causes of burnout among 195 medical students in their second and fourth year of study at Mashhad University of Medical Sciences. The results showed that the mean scores of emotional exhaustion, cynicism, and academic efficiency were  $3.89 \pm 0.40$ ,  $3.87 \pm 0.46$ , and  $4.12 \pm 0.38$  out of seven, respectively, which indicates students had the highest level of academic burnout in personal inefficiency and incompetence component, and the lowest level was observed in indifference (28).

**9.** In a descriptive-analytical and cross-sectional study on 320 medical students, the relationship between educational justice and academic burnout was investigated among medical interns of Ahvaz Jundishapur University of Medical Sciences. The results showed that the mean score of academic burnout was  $49.10 \pm 5.99$ , indicating that academic burnout was above average. There was a significant relationship between educational justice and gender ( $p < 0.05$ ) (29).

**10.** In a cross-sectional study on 230 clinical medical students, occupational burnout among medical students at the clinical level and its relationship with professional ethics were investigated. Results showed that the mean score of burnout was  $61.37 \pm 20.44$  (moderate). In this study, 54.3% of the students had low,

35.2% had mild, and 10.4% had high job burnout. There was no significant relationship between the increase in academic years and burnout (30).

## 2. USA

1. A study on 545 medical students in three medical schools in Minnesota, USA, aimed to identify the prevalence of burnout, variation of its prevalence during medical school, and the impact of personal life events on burnout and other types of student distress. The results showed that burnout was present in 239 (45%) of medical students (31).

2. A cross-sectional study on 185 first-year medical students at an urban medical school in California examined the purported link between Myers-Briggs Type Indicator (MBTI) preferences and distress and burnout scores. The results reported high scores on EE with 64.8%, CY with 41.8%, and decreased AE with 20.9% for the three dimensions of the MBI-SS. Only 11.5% of respondents had high scores on all three dimensions of burnout (32).

## 3. Saudi Arabia

1. A cross-sectional study on 356 medical students from the first to fifth years in a medical college, prevalence of and the risk factors associated with burnout and stress for medical students were investigated. The results showed that the prevalence of high burnout was 38.2%, expressing high EE (77.8%), high CY (65.7%), and low AE (45.5%) (33).

2. In a cross-sectional survey on 438 medical students from the second to the sixth year at Jazan University, the prevalence of burnout syndrome and its associated factors among medical students were assessed. The results showed a concerning prevalence of burnout of 60.2% (95% CI: 55.6–64.8) among all medical students (34).

3. In a cross-sectional study on 336 preclinical and clinical-year medical students, the prevalence of burnout among Qassim medical students was assessed. The results showed that a total of 30 students among 336 (8.9%) suffered from a high level of MBI-SS. More precisely, 29.5% had high EE, 3% had high CY, and 33.9% exhibited a high level of AE. Overall, the mean of all medical student participants was in the moderate range of severity for EE, CY, and AE (35).

4. In a cross-sectional study, the prevalence of burnout and its associated stressors in medical students in problem-based learning and traditional curricula were assessed among 593 medical students at Imam Abdulrahman Bin Faisal University. The results showed that 55.5% of students had high burnout levels (36).

5. In a cross-sectional study on 249 first to fourth-year medical students at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), levels of burnout in medical students were assessed, and the influence of extracurricular activities on burnout at a medical school was explored. The results showed that the level of high burnout was 67.1%. The study also revealed that the majority (62.3%) of students had high levels of CY, 58.6% had high levels of EE, and 60.2% had low levels of AE (37).

## 4. UK

1. A five-year prospective longitudinal cohort study on 204 medical students at Manchester University assessed the psychological morbidity and symptoms of burnout in medical students during their undergraduate training and investigated baseline predictors of psychological morbidity in students in their final year. Students in their first, fourth, and fifth years of undergraduate medical training were assessed using the GHQ-12 and the Maslach Burnout Inventory. Of 204

students, 172 (84.3%), 157 (77.0%), and 155 (75.9%) in their first, fourth, and fifth years of study completed the assessments, respectively. This study showed that a small group of students repeatedly experience psychological distress during their medical training. Although the students found the first year of the medical studies more stressful than did their fellow students, this was not true of subsequent years (38).

2. A study on 356 medical students at the Universities of St. Andrews and Manchester investigated whether health behaviors can predict burnout in medical students. The results showed that 54.8% of students had high levels of EE, 34% had high levels of CY, and 46.6% reported low levels of AE (39).

## **5. Uganda**

1. In a single-center, cross-sectional study on 145 students pursuing Bachelor of Medicine and Bachelor of Surgery (MBCbB) degrees, the prevalence and factors associated with burnout among medical students in their pre-clinical and clinical years of study were investigated. The results showed that a total of 135 students (93.1%) had high levels of EE, 90 (62.1%) students had low levels of AE, and 141 (97.2%) medical students had high levels of CY. Overall, 79 (54.5%) students had burnout as defined by the MBI-SS tool (40).

## **6. China**

1. A cross-sectional study on 453 first to fifth-year medical students investigated burnout and study engagement among medical students at Sun Yat-sen University. The results showed that approximately one in 11 (9.27%) students experience high burnout, indicating that the medical students were highly vulnerable to burnout. Moreover, the prevalence of burnout was related to grade levels but not gender or the choice of

major. Students in higher grades displayed increased burnout risk, higher mean burnout subscale score of cynicism, lower mean burnout subscale of AE, and decreased study engagement subscale scores of dedication and absorption (41).

## **7. Egypt**

1. In a cross-sectional study on 320 undergraduate medical students in the Zagazig and Menoufia faculties of medicine, the prevalence of stress and burnout and their contributing factors were investigated. The results showed a concerning prevalence of stress (84.7%) and burnout (45.6%) among undergraduate medical students. These findings were statistically significant among the students of clinical education ( $p < 0.05$ ) (42).

## **8. India**

1. In a descriptive cross-sectional study on 154 students in their second to fourth years of medical studies at the Government Erode Medical College in Tamilnadu, the prevalence of burnout among medical students in online classes during the COVID-19 pandemic was investigated. The results showed that 18.2% of students experienced severe burnout during distance learning. Internal reliability (Cronbach's alpha) coefficients of the MBI-SS subscales were 0.799 for EE, 0.801 for AE, and 0.611 for CY (43).

2. A cross-sectional study on 100 Indian medical students investigated perceived stress, coping, and burnout among first-year medical undergraduates. The results found high emotional exhaustion and cynicism in 70% and 79% of students, respectively, and low academic efficacy in 44%. Also, 62% experienced burnout according to the two-dimensional criteria. In comparison, 30% had burnout according to the three-dimensional criteria (44).

## **9. Singapore**

1. A longitudinal study on 59 medical students at Duke-NUS Medical School investigated the association between specific job resources measured at the beginning of the first year of medical school with burnout symptoms occurring later in the first year. The results indicated that 32.2% of students showed evidence of burnout at some point during their first year of medical school (45).

## 10. Belgium

1. An anonymous cross-sectional study on 343 medical students from four education years (first and third years of Bachelor's, first and third years of Master's) investigated the significant predictors (from perceived stress, empathy, and perceived social support) of academic burnout and their respective importance. The results showed that two academic burnout domains (EE and CY) changed significantly with the study year. Cynicism increased as the academic years progressed, and EE was the highest at the critical time of graduation of the academic curriculum. Moreover, female students presented significantly higher scores, especially in emotional exhaustion (46).

## 11. Brazil

1. In a study on 193 second-year medical students in their last semester of the preclinical phase at the Fluminense Federal University (Niterói, Brazil), the influence of burnout and sleep difficulties on the quality of life among preclinical medical students was investigated. The results showed that the percentages of EE  $\geq 4$ , CY  $\geq 4$ , and AE  $< 4$  in students were 64.2%, 19.2%, and 43.5%, respectively (47).

2. A cross-sectional study on 265 students in their first four years of undergraduate medical study at the Barretos School of Health Sciences, Dr. Paulo Prata (Barretos, São Paulo state, Brazil) evaluated the prevalence and possible factors associated

with the development of burnout among medical students. The results showed that 70.6% of students presented high levels of EE, 52.8% had high CY, and 48.7% had low AE. The two-dimensional criteria (high EE and high CY) indicated that 44.9% of students experienced burnout. Based on the three-dimensional criteria, 26.4% of students presented with burnout (48).

## 12. South Korea

1. A mixed-method study on 127 first- to fourth-year medical students at Ajou University School of Medicine examined the relationships between medical school students' academic burnout, empathy, and calling and investigated whether their calling has a mediating effect on the relationship between academic burnout and empathy. The results showed that the average perceived academic burnout was  $4.64 \pm 0.66$ , EE was  $5.25 \pm 1.07$ , AE was  $4.52 \pm 0.89$ , and CY was  $4.16 \pm 1.02$  out of a score of seven (49).

## 13. Canada

1. In a cross-sectional study among 129 first to fourth-year medical students at two large Canadian universities, the demographic and behavioral predictors of mental health and burnout in medical students were investigated. The results showed that the prevalence of burnout in students was 20.9%. Female medical students reported higher levels of burnout than male students. Also, the third year of medical school significantly predicted lower mental health and higher burnout scores (50).

## 14. Pakistan

1. A cross-sectional study on 600 medical students in Karachi, Pakistan, aimed to determine the risk factors, measure their current prevalence, and identify the areas of focus to benefit the primary care-oriented community as a whole. The

results showed that 18.2% of students were burned out. The syndrome was significant in those suffering from inadequate sleep and those having anger management issues and non-dominating temperaments ( $p < 0.05$ ) (51).

### **15. Spain**

1. A cross-sectional study on 270 Spanish medical students, 176 (65%) in the third year (last year of preclinical training), and 94 (35%) in the sixth year of training (final year of clinical training), investigated the risk of burnout in medical students in preclinical and clinical years of training. The results showed that approximately one in four medical students were at high risk of burnout, and the prevalence of burnout risk was significantly higher in sixth-year students, 35 (37.5%) compared with students in the third year of training 26 (14.8%). Cronbach's alpha for the three subscales of Maslach Burnout Inventory-Student Survey of the whole sample was satisfactory ( $\alpha > 0.70$ ),  $EE = 0.78$ ,  $CY = 0.78$ , and  $AE = 0.71$  (52).

### **16. Nepal**

1. A cross-sectional study on 651 medical students aimed to determine the prevalence of depression, anxiety, burnout, and their associated factors and identify their predictors in a sample of medical students and residents in a medical school in Nepal. The results showed that the prevalence of burnout in students was 48.8% (53).

### **17. Ireland**

1. An observational cross-sectional questionnaire was developed to examine 383 medical students and evaluate the relationship between physical activity and burnout in medical students at UCC. The results showed that 44.8% of students had high levels of  $EE$ , 25.6% had high levels of  $CY$ , and 51.2% had low levels of  $AE$ . Female students reported significantly

higher levels of emotional exhaustion ( $p = 0.02$ ) than males (54).

### **18. Kenya**

1. A study on 182 medical students investigated the prevalence of burnout and its relationship with coping among medical students. The results showed that approximately 17% of the students perceived low burnout, 66% moderate burnout, and 18% high burnout. A high proportion (84%) of the students perceived moderate to high burnout (55).

## **4- DISCUSSION**

This systematic review aimed to summarize and compare studies on academic burnout among medical students worldwide. Results showed that the prevalence of academic burnout varied in different countries from 8.9% to 91.1%. Medical students are distinguished from the general student population as they face a curriculum that is long and emotionally draining and a culture that imposes high, sometimes unrealistic expectations and productivity above all else (56). In a review study, researchers found that 35–45% of medical students had high emotional exhaustion, 26–38% had high depersonalization, and 45–56% had symptoms suggestive of burnout (57).

Burnout is a form of psychological distress presenting as a combination of symptoms that indicate a chronic state of distress (58). It is defined as a psychological syndrome resulting from a response to emotional and interpersonal stressors, such as heavy workload or patient contact (59). Recently, there has been growing concern regarding the mental health of medical students. In a systematic review across 43 countries, the pooled prevalence of mild to severe depressive symptoms among medical students was 27.2%. Longitudinal studies reported a mean increase of 13.5% in depressive symptoms from the beginning to the end of medical school



(60). Results of a systematic review of university students in 2021 (including 20 studies) showed that the prevalence of syndrome dimensions was 55.4% for emotional exhaustion, 31.6% for cynicism, and 30.9% for academic efficacy (61).

Results of a systematic review in Chinese medical schools from 1989 to July 2016 (including 33 studies) showed that higher levels of burnout were generally observed in male students, senior medical students, and those who already experienced poor psychological functioning (62). Similar estimates have been shown in Canada, indicating that approximately 37% of medical students reported burnout (63).

Studies on the relationship between gender and mental illness and psychological distress in medical students indicate that female medical students have a significantly higher prevalence of depression, anxiety (14), and burnout (64) than male students. However, one Canadian study found that gender was not a significant predictor of EE or CY (65). A study in Pakistan (66) found that female medical students are at an increased risk for burnout, with 60% reporting high levels of burnout compared to 39% of male medical students. In the USA, Dyrbye and Shanafelt (64) found that female medical students were at an increased risk for EE, while male medical students were at an increased risk for CY.

Two other studies also found that male medical students reported higher CY than females, suggesting that males may be at an increased risk for this dimension of burnout (67, 68). This may also suggest that male medical students are more likely to feel detached or cynical toward medical school rather than feeling emotionally exhausted, which may seem too personal (69). From the Canadian literature on medical student burnout, one study found that burnout increased significantly from the beginning to the end of the third year of the study (70), while another study

found that EE and CY increased with each year of the study (71). Research has also revealed that the third year of study (last year of preclinical training) positively predicts burnout (72-74), with third-year medical students reporting significantly higher EE, CY, and burnout than medical students in other years of study. Daya and Hearn also suggest that prevention efforts should target female students, those of minority ethnicities, and second-year medical students, while treatment efforts should target third and fourth-year medical students (75).

## 5- CONCLUSION

The findings estimated that academic burnout among students across worldwide studies ranged from 8.9% (Saudi Arabia) to 91.1% (Iran). Results showed that the highest prevalence of each dimension of the syndrome was estimated at 93.1% for emotional exhaustion, 97.2% for cynicism, and 62.1% for academic efficacy, and the lowest prevalence of each dimension of the syndrome was estimated at 23.9% for emotional exhaustion, 19.2% for cynicism, and 20.7% for academic efficacy. The review findings highlight the recognition of the burnout problem amongst medical students worldwide. The literature has suggested that medical students who are female, relatively older (i.e., > 30 years), in their third year of study, and are intending to pursue primary care are at an increased risk for poor mental health and burnout; however, there remain several gaps in the literature.

## 6- AUTHORS' CONTRIBUTIONS

Study conception or design: BM, and SI; Data analyzing and draft manuscript preparation: BF, MN, and NK; Critical revision of the paper: BM, and SI; Supervision of the research: BF and SI; Final approval of the version to be published: BM, BF, MN, NK, SN, and SI.

**7- CONFLICT OF INTEREST:** None.**8- REFERENCES**

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