

Burnout among Undergraduate Medical Students: Prevalence and Associated Factors

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Abstract

Background: Burnout is a psychological syndrome that develops as a long-term reaction to chronic interpersonal stressors on the job. Medical students are at high risk because they have severe academic pressures and emotional demands. **Aims:** To evaluate the prevalence and determinants of burnout in undergraduate medical students at Suez University. **Methods:** A cross-sectional analytical survey was conducted at Suez University in the academic year 2022–2023, among 282 undergraduate medical students using a structured questionnaire. The Maslach Burnout Inventory - Student Survey (MBI-SS) was used to assess three burnout dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment. Socio-demographic and academic data, lifestyle habits, psychological and professional stressors were collected. Descriptive and inferential statistics were performed. **Results:** The high levels of student burnout were identified in emotional exhaustion (56.02%), depersonalization (60.28%), and low personal accomplishment (81.21%). Burnout correlated significantly with academic year, exercise routine, sleep duration, family history of psychological disorder, and various relationship, training, and professional stressors. **Conclusion:** Burnout is very prevalent among Suez University medical students, particularly in higher years of study and among students with more than one academic and psychosocial stressor. Stress management and curriculum modification intervention are warranted.

Keywords: Burnout, Maslach Burnout Inventory, Emotional exhaustion, Depersonalization, Personal accomplishment

Introduction

Burnout is a mental illness characterized by emotional exhaustion (EE) syndrome of depersonalization (DP) and reduced personal accomplishment (PA) and is most prevalent in individuals in high-pressure educational and working environments. ⁽¹⁾ Medical school is highly stressful and therefore has high rates of psychological distress among students. ⁽²⁾ Medical students are especially vulnerable with the long study hours, perpetual exams, emotional stress from exposure to clinics, and pressure for academic

achievement. ⁽³⁾ Burnout can negatively influence students' academic performance, clinical competence, and mental health. Burnout has been associated with lower empathy, reduced professionalism, increased risk of depression and anxiety, and even suicidal ideation. ^(4, 5) These effects can ultimately carry over to the quality of care provided to patients and to the long-term sustainability of the health workforce. ⁽⁶⁾ According to recent studies in developed and developing countries, the prevalence of burnout among medical students has been on the rise. ^(7, 8) In Egypt,

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medical education is characterized by rigorous curriculum, extended study hours, and competitive environments, all of which may be potential risk factors for burnout among students.⁽⁹⁾ Determination of the prevalence of burnout and risk factors among Egyptian medical students is needed in order to inform policy and institutional reforms.

Subjects and Methods

This cross-sectional analytical study was conducted for three months, January to March 2023, at the Faculty of Medicine, Suez University. The study targeted undergraduate medical students in all five years of study. From the point of faculty registry, the study enrolled students in the academic year 2022–2023 were put at approximately 403. The study involved 282 students, representing a rough 70% response rate. A comprehensive sampling process was utilized such that all students attending scheduled lectures and academic activities were enrolled. The study aimed at quantifying the prevalence and predictors of burnout among medical students. Research question: What is the prevalence of burnout in Suez University undergraduate medical students and what are academic and socio-demographic predictors significantly associated with it? -. Data Collection Tools: It employed a standardized, self-reported questionnaire and consisted of: Socio-demographic details: For example, gender, year of study, socioeconomic status, lifestyle habits (for example, smoking, sleep, exercise), and family history of chronic or psychiatric illness. Measurement of burnout: The Maslach Burnout Inventory–Student

Survey (MBI-SS)⁽¹⁰⁾ was used to measure three dimensions of burnout: Emotional Exhaustion (EE), Depersonalization (DP), Reduced Personal Accomplishment (PA). It has been shown to be valid for use in student populations and has high internal consistency. Stressors inventory: Inquired about academic, relationship, field training, and professional stressors the students experienced. Data were inputted and coded into the Statistical Package for Social Sciences (SPSS), version 17. Descriptive statistics (frequencies and percentages) were used to report categorical variables. Chi-square (χ^2) test was used to test associations between independent variables and burnout levels. The statistical significance level was $p < 0.05$. Results were reported using tables and visual diagrams, e.g., bar and pie charts.

Results

The results of this study are described in terms of 1. Socio-demographic Characteristics, 2. prevalence of stressors related to burnout, 3. Prevalence of burnout.

Socio-demographic Characteristics

Among 282 medical students; 53.5% were women and 46.5% were men. More than fifty percent of them (54.6%) were in the clinical stage and (45.4%) in the preclinical stage, of which (20.2%) were in the 1st academic year, (20.6%) in the 2nd academic year, (23.4%) in the 3rd academic year, (16.7%) in the 4th academic year and (19.1%) of them in the 5th academic year. 85.8% of them possess moderate socioeconomic condition, while (8.5%) of them possess high socioeconomic condition and (5.7%) possess low socioeconomic condition only.

Exercise routine exists in only (39%) of them, while (6.7%) of them are smokers. Regarding sleeping hours, a day, most of them (46.8%) sleep 6-7 daily hours, (44.7%) sleep around 8-9 daily hours while (8.5%) sleep just 4-5 hours a day. In relation to use of legal drugs, most of them (63.8%) habitual

intake of caffeine, (19.9%) of them habitual intake of pain killers, (5.3%) steroids, (4.3%) cough medicines, (3.5%) antidepressants and just (3.2%) sedatives. Among the respondents, 13.8% have a history of mental disorders among their families as shown in table (1).

Table (1): Frequency distribution of Socio-demographic data of the study participants:

Variable	n (%)
Gender	
Male	131 (46.5%)
Female	151 (53.5%)
Academic phase	
Preclinical	128 (45.4%)
Clinical	154 (54.6%)
Academic year	
1	57 (20.2%)
2	58 (20.6%)
3	66 (23.4%)
4	47 (16.7%)
5	54 (19.1%)
Socioeconomic state	
Low	16 (5.7%)
Moderate	242 (85.8%)
High	24 (8.5%)
Exercise habit	110 (39%)
Smoking habit	19 (6.7%)
Daily sleep hours	
4-5	24 (8.5%)
6-7	132 (46.8%)
8-9	126 (44.7%)
Regular use of legal drugs	
Pain relievers	56 (19.9%)
Sedatives	9 (3.2%)
Caffeine	180 (63.8%)
Steroids	15 (5.3%)
Antidepressants	10 (3.5%)
Cough drugs	12 (4.3%)
Family history of psychological disorders	39 (13.8%)

Prevalence of stressors related to burnout

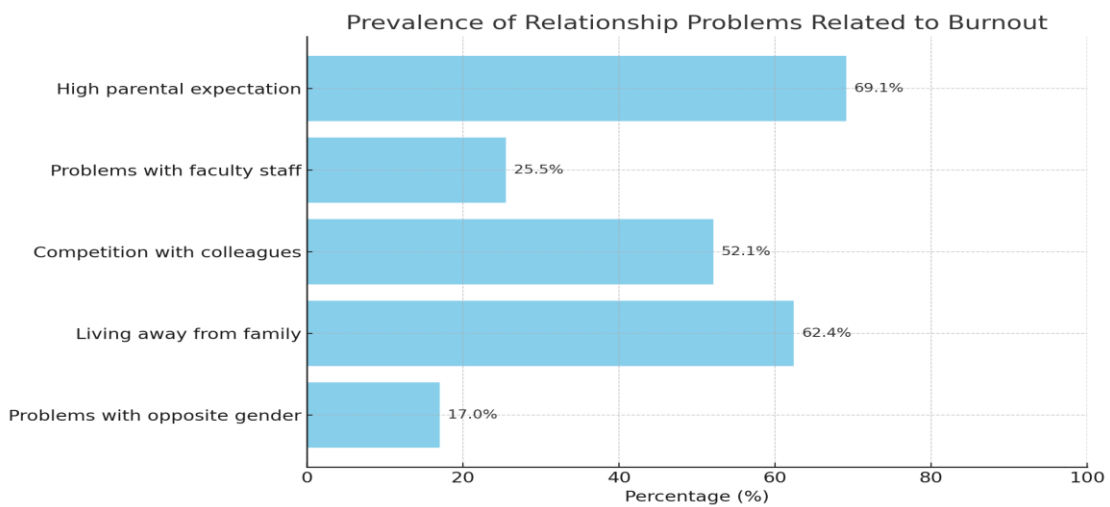


Figure (1): prevalence of relationship problems related to burnout among participants

About (17%) of them have opposite sex problems, (25.5%) of them have problems with faculty members, and (52.1%) of them have competition with

workmates. Meanwhile; (62.4%) of the respondents live away from home and (68.1%) of them have high family expectation as shown in figure (1)

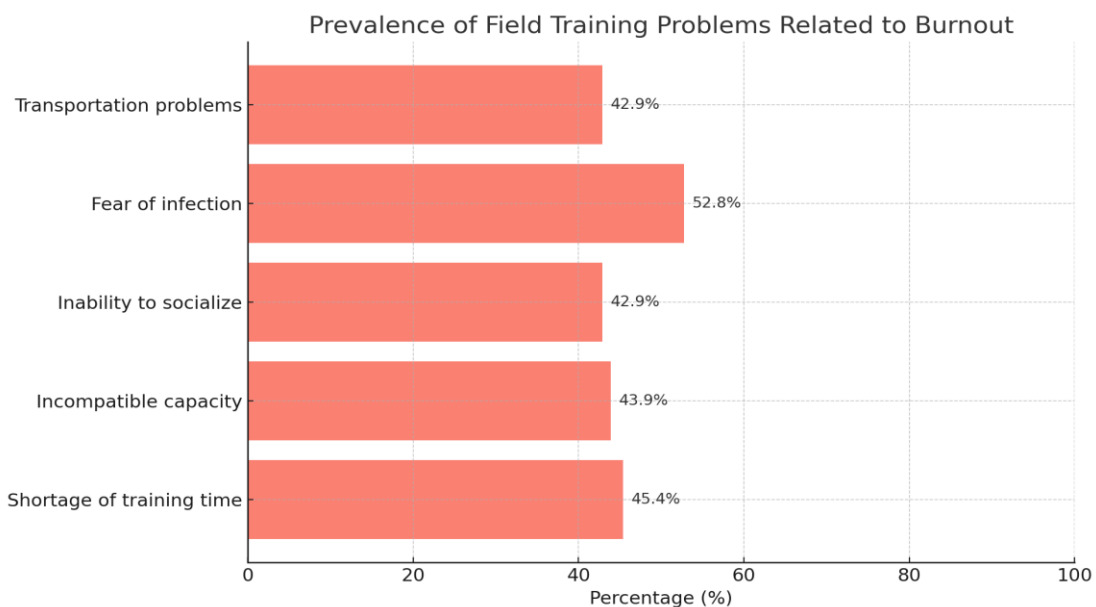


Figure (2): prevalence of field training (PHC & hospital) problems related to burnout among participants

Based on field training, (45.4%) of them indicate lack of training time, (43.9%) of them indicate capacity of field training not aligned with student number, (42.9%) of them are unable to socialize with field training environment, (52.8%) of them fear being infected, and (42.9%) of them

face transportation problem as shown in figure (2).

As regards to the professional matters, (21.9%) of them have personal illness or disability that can affect their study, (49.6%) time limitation for training is complained by them, (74.8%) of them fear patient

injury, (66.3%) of them complain clinical skills practice is not adequate, (51.4%) of them faced problem during case taking and presenting, (67.4%) of them complain of lack of feedback, (58.2%) unable to respond patients'

questions, (34%) of them exposed to physical or verbal abuse of PHC centre or hospital staff and most of them (76.2%) are worried about incomplete future career as can be seen from table (2)

Table (2): prevalence of professional problems related to burnout among participants:

Variable	n (%)
Having personal illness or disability that may affect the academic performance	62 (21.9%)
Time limitation for training	140 (49.6%)
Fear of hurting a patient	211 (74.8%)
Clinical skills practice is not enough	187 (66.3%)
Difficulties of case taking and presentation	145 (51.4%)
Lack of regular feedback	190 (67.4%)
Inability to answer patient's questions	164 (58.2%)
Verbal or physical abuse of PHC centre or hospital staff	96 (34%)
Worry about the future career	215 (76.2%)

Prevalence of burnout

The Current Study comprised 282 medical students; out of them 56.02% had high scores, 29.787% had moderate scores and 14.18% had low scores in occupational exhaustion section. In depersonalization section, 60.284 % of the responses had high

scores, 32.624% had moderate and 7.09% had low scores. While in the personal accomplishment assessment section, 81.21% of the responses had low scores, 15.25% had moderate and 3.55% had high scores as depicted in table (3).

Table (3): Degree of burnout between medical students participating in the study:

	Occupational exhaustion	Depersonalisation	Personal accomplishment assessment
low	40 (14.18%)	20 (7.09%)	229 (81.21%)
moderate	84 (29.787%)	92 (32.624%)	43 (15.25%)
High	158 (56.02%)	170 (60.284%)	10 (3.55%)

In Occupational exhaustion, 158 medical students had high scores; 22.78% of which are from 1st academic year, 16.45% are from 2nd academic year, 24.05% are from 3rd academic year, 18.98% are from 4th academic year and 17.7% are from 5th academic year. Around 84 students achieved medium scores; 10.7% of them belong to the 1st academic year, 23.8% belong to the 2nd academic year, 26.19%

belong to the 3rd academic year, 14.28% belong to the 4th academic year and 25% belong to the 5th academic year. While forty students have only low score; 30% of whom are in 1st academic year, 32.5% are in 2nd academic year, 15% are in 3rd academic year, 10% are in 4th academic year and 12.5% are in 5th academic year as shown by table (4).

Table (4): Prevalence of occupational exhaustion between medical students participating in the study:

Academic year	low	moderate	High
1	12 (21.1%)	9(15.79%)	36 (63.2%)
2	13 (22%)	20 (33.9%)	26 (44.1)
3	6 (9.1%)	22 (33.3%)	38 (57.6%)
4	4 (8.7%)	12 (26.1%)	30 (65.2%)
5	5(9.3%)	21 (38.9%)	28 (51.9%)

In depersonalization, 170 medical students had high score; 20% of them are in 1st academic year, 17.65% are in 2nd academic year, 24.12% are in 3rd academic year, 17.65% are in 4th academic year and 20.59% are in 5th academic year. Around 92 students received moderate score: 22.83% of them are studying in 1st year, 25% are studying in 2nd year, 20.65% are

studying in 3rd year, 15.2% are studying in 4th year and 16.3% are studying in 5th year. At this period just twenty students had poor score; 10 % are in 1st academic year, 30 % are in 2nd academic year, 30 % are in 3rd academic year, 10% are in 4th academic year and 20 % are in 5th academic year as shown in table (5)

Table (5): Prevalence of Depersonalisation between medical students participating in the study:

Academic year	low	moderate	High
1	2 (3.5%)	21 (36.84%)	34(59.64%)
2	6 (10.2%)	23(38.98%)	30 (50.84%)
3	6 (9.1%)	19 (28.8%)	41 (62.1%)
4	2(4.34%)	14(30.43%)	30 (65.2%)
5	4(7.4%)	15 (27.8%)	35 (64.8%)

The personal accomplishment, 229 were the low scorers in test; 20.1% of them are of 1st academic year, 20.1 % are of 2nd academic year, 23.14% are of 3rd academic year, 17.9% are of 4th academic year and 18.78 % are of 5th academic year. Around 43 students received moderately; 20.9 % of them are enrolled in 1st academic year, 25.58 % enrolled in 2nd academic year, 25.58 % enrolled in 3rd academic year,

6.97 % enrolled in 4th academic year and 20.9 % enrolled in 5th academic year. There were just ten students with high score; 20 % of them are in 1st academic year, 20 % are in 2nd academic year, 20 % are in 3rd academic year, 20% are in 4th academic year and 20% are in 5th academic year as presented in table (6).

Table (6): Assessment of Personal accomplishment between medical students which participating in the study:

Academic year	low	moderate	High
1	46(80.7%)	9 (15.8%)	2 (3.5%)
2	46 (77.9%)	11 (18.64%)	2 (3.39%)
3	53 (80.3%)	11 (16.7%)	2 (3%)
4	41 (89.1%)	3 (6.5%)	2 (4.35%)
5	43 (79.6%)	9 (16.7%)	2 (3.7%)

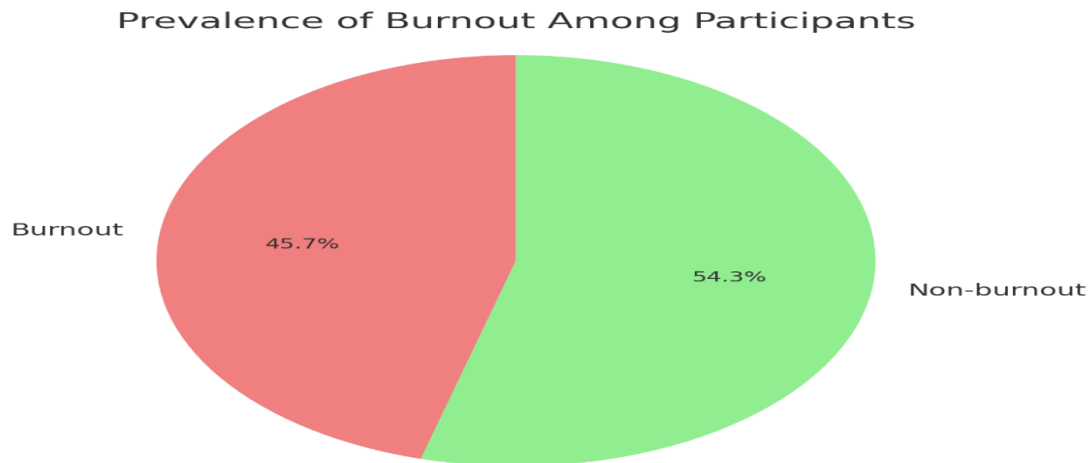


Figure (3): Prevalence of Burnout among participants

The current Study included 282 medical students; approximately 45.74% have burnout according to study criteria of burnout (The Maslach Burnout Inventory) as shown in figure (3).

With respect to this study, 129 medical students are burning out;

21.7% of them are in the 1st academic year, 17.1% in the 2nd academic year, 26.36% in the 3rd academic year, 18.6% in the 4th academic year and 16.28% in the 5th academic year as shown by table (10). One hundred and twenty-nine students with a distribution of 38.76% preclinical phase and 61.24% clinical phase as shown in table (7).

Table (7): PREVALENCE OF BURNOUT BY ACADEMIC YEAR AMONG PARTICIPANTS

ACADEMIC YEAR	Number of Students with Burnout (%)
1 ST	28 (21.7%)
2 ND	22 (17.05%)
3 RD	34 (26.36%)
4 TH	24 (18.6%)
5 TH	21 (16.28%)

Discussion

The current study demonstrates a significant level of burnout among undergraduate medical students at Suez University, with 45.7% of the students qualifying for burnout based on the MBI-SS scale. This percentage is in line with that reported in a multi-center Egyptian study conducted at Zagazig and Menoufia universities, with a 45.6% rate of burnout and heightened risk during the clinical stage.⁽¹¹⁾ Similarly, a research project from Cairo University presented high

emotional exhaustion (38%), depersonalization (32%), and low personal efficacy (31%).⁽¹²⁾ These consistent findings attest to the systemic underpinnings of burnout across various Egyptian medical schools. The study identified 56% high emotional exhaustion, 60.3% high depersonalization, and 81.2% low personal accomplishment among the respondents—particularly high compared to regional and global averages. The extremely high rate of low PA most likely reflects

institutional deficits, including negative feedback, insufficient hands-on skill training, and uncertainty about career development.^(13, 14) Burnout was considerably more prevalent among clinical-phase students (61%), with the third year being most impacted (26%). Global reporting, the research has attributed the trend to growing patient exposure, academic pressure, and stressful transition into clinical positions.^(15, 16, 17) The findings corroborate previous findings of a rise in burnout during clinical years due to increased exposure to patients and academic burden.⁽¹⁸⁾ Low personal accomplishment in over 80% of students is particularly alarming and can result from inadequate feedback, little development of clinical skills, and academic assistance.⁽¹⁹⁾ Key correlates are exercise regimen, sleeping hours, psychological background, and occupational stressors, which corroborate previous findings of another similar study.⁽⁷⁾

Stressors Driving Burnout: Relationship Stressors: Peer competition (52%), family expectations (68%), and relationship issues (17%) were the main sources that contributed to emotional exhaustion and depersonalization. These findings are consistent with those in Ain Shams and Cairo University, where family expectations and comparison study were strong predictors of burnout.⁽²⁰⁾ Field and Clinical Stressors: Insufficient clinical training time (45%), fear of infection (53%), and failure to adjust (43%) reflect structural barriers. These have been replicated under research in Saudi and North Africa as a cause of cognitive overload and emotional

distance.^(21, 22) Professional Stressors: Fear of harming patients (74.8%), inadequate feedback (67.4%), poor development in clinical skills (66.3%), and apprehension about the future career opportunities (76.2%) represent both psychological burden and institutional shortcomings. These further align with Middle Eastern and European research that points towards burnout being exacerbated by lack of career clarity and subjective incompetence.^(7, 23) Other variables included low physical activity, poor sleep quality, high caffeine and analgesic use, and family history of mental illness—all highly correlated with burnout in previous research.^(24, 25) These findings support calls for comprehensive wellness programs at medical schools.

Strengths of the research are a representative sample for all years of study and use of an established burnout scale (MBI-SS). Weaknesses are the cross-sectional design, which precludes causal inferences, and self-reporting, which could result in bias or underreporting. These findings underscore the need for immediate institutional interventions: Inclusion of formal mentorship and feedback systems. Provision of mental health and counseling services. Reorganization of clinical timetables to balance learning and well-being. Enhancing physical activity, peer support, and sleep hygiene. Integrating career development modules in early medical education. These all-multi-layered methods are essential to avoid burning out and ensure medical students' professional sustainability and well-being.

Recommendations

Considering the extremely high rate of burnout, especially among clinical-year students, and the outline of many academic, personal, and institutional stressors, the following multi-level recommendations should be made: Firstly: Institutional-Level Interventions; Institute Formal Mentorship Programs: Assignments of faculty mentors to students for continuous academic and emotional guidance throughout their education. Increase Mental Health Services: Convenient access to confidential counseling, psychological support, and mental wellness workshops. Curriculum Reforms: Reshaping clinical training timetables to reduce overload, allow for sufficient skill development time, and facilitate appropriate rest. Integrate Regular Feedback Mechanisms: Constructive feedback on academic as well as clinical performance will instill feelings of movement and individual accomplishment. Secondly: Academic Support and Environment; Develop Burnout Prevention Workshops: Incorporating time management skills, coping strategies, and self-care activities into the formal curriculum. Inject Career Development Programs: Since the earliest pre-clinical years, programs addressing uncertainty over future professional choices and reducing associated anxiety. Embrace Collaborative Learning: Reduce competitiveness by facilitating team learning, peer learning, and shared scholarly goals. Thirdly: Lifestyle and Wellness Promotion; Encourage Physical Fitness: Establishing on-campus physical exercise programs, sports competitions, and access to recreational facilities to promote regular exercise. Promote Sleep

Hygiene and Nutrition: Health promotion campaigns on the importance of good sleep and proper nutrition in ensuring cognitive and emotional well-being. Monitor Substance Use: Educate students on the potential risks of excessive amounts of caffeine and analgesic use, and stress management options. Finally: Monitoring and Evaluation; Annual Burnout Screening: Including systematic application of validated instruments like the MBI-SS in monitoring student well-being and early intervention. Feedback-Informed Policy Changes: Engaging students in the process of critiquing institutional practice and drawing on their feedback to inform policy change. Implementing these recommendations systematically would stand to decrease burnout, improve student well-being, and promote a healthier, more supportive climate for learning by future physicians.

Conclusion

Burnout is common and multi-factorial among Suez University medical students. Redesign of the curriculum, enhanced support systems, and student wellness programs are urgently required to address this pervasive issue.

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