

## Prevalence and Correlates of Burnout among Undergraduate Medical Students – A Cross-sectional Survey


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### ABSTRACT

**Background:** Burnout among medical students is important for its prevalence, consequences, and modifiable risk factors. Although there are studies on the topic across the globe, Indian studies are few in number. A prevalence estimate of burnout and its determinants among Indian medical graduates will keep us informed about the emotional and motivational factors hindering their professional growth. **Methods:** From a total of 500 students spanning 5 professional years, data could be collected from 375 students. The study used a questionnaire primarily consisting of “personal burnout” domain of the Copenhagen Burnout Inventory (CBI), which is a validated instrument to assess the burnout at a cutoff score of 50. The questionnaire also included a set of potential personal correlates of burnout. In addition to summary statistics, both univariate and multivariate analyses were used for discerning the relationship of these correlates with burnout. **Results:** The prevalence of burnout among medical students in the college under study was 48.5% (95% confidence interval 43.4–53.7). The proportions of moderate, higher, and severe burnout were 44.8%, 3.2%, and 0.5% respectively. Univariate and multivariate analyses revealed that female gender and perceived stress were associated with burnout. Choosing medicine by one’s own choice and maintaining hobbies and interests were associated with less chance for burnout. **Conclusion:** Burnout is a prevalent phenomenon among medical students. There are modifiable risk factors for burnout and addressing them will help in training a medical student with high motivation and professionalism.

**Key words:** Burnout, correlates, medical students, prevalence

**Key messages:** Nearly 50% of medical students experience burnout. Exposure to stressful life events, female gender, and dissatisfaction with choice of the profession are related to burnout. Maintaining hobbies and interests seems to be protective against burnout. Measures to prevent burnout are important in the formation of a doctor with motivation, a sense of personal accomplishment, and professionalism.

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Burnout is a construct characterized by varying degrees of emotional exhaustion, depersonalization (i.e., feeling detached from or being callous toward patients), and a low sense of personal accomplishment.<sup>[1]</sup> Herbert Freudenberger, a psychologist, described the term “burnout” for the first time while he was studying the emotional problems among social workers. According to him, the central characteristic of burnout is the extinction of motivation or incentive, especially when one’s devotion to a cause or relationship fails to produce the desired results. “Burnout” is usually used to describe the consequences of severe stress experienced by and high standards expected of people working in the “helping” professions, such as doctors and nurses.<sup>[2]</sup> In addition to efficient patient care, the doctors are supposed to uphold the ideals of the profession and perform the role of healthcare managers. Optimism about the future of medicine and satisfaction with career choice is expected from them. Their curriculum and training are geared toward these goals. But some components of the training and lack of adjustment push a sizable proportion to chronic stress and burnout.<sup>[3]</sup>

Systematic and narrative reviews have concluded that around 50% of the medical students have burnout.<sup>[3,4]</sup> Emotional exhaustion, depersonalization, and overall burnout were substantially more prevalent among medical students and residents than age-matched college graduates not studying medicine.<sup>[5]</sup> Burnout has serious professional and personal consequences, including a lack of professionalism (e.g., lack of honesty, integrity, altruism, or self-regulation).<sup>[3]</sup> Burnout also affects trainee’s view about medicine as a career and may lead to serious thoughts about dropping out.<sup>[6]</sup> It may even affect the selection of the specialty.<sup>[7]</sup> Significant personal consequences such as substance use and suicidal ideation are also associated with burnout.<sup>[8,9]</sup>

The findings that medical students during their matriculation have a similar or even better mental health profile than age-matched college graduates pursuing other careers and that medical students’ mental health deteriorates once they are in the medical school to become worse than that of the age-matched college graduates suggest that the origins of burnout are rooted in the learning environment and curriculum.<sup>[5,10]</sup> Some of the curriculum-related factors associated with burnout include grading system and peer collaboration.<sup>[11,12]</sup> Learning-environment-related factors such as nonsupportive and cynical supervisors and perception of maltreatment are also related to burnout.<sup>[13]</sup> Whether they are really causing or just the consequences of burnout need to be debated.<sup>[3]</sup> Individual factors associated with burnout include nonethnic status, neuroticism, life stressors, and

financial burden.<sup>[14]</sup> Competition for residency and expansion of curricular requirements are other postulated risk factors for burnout.<sup>[3]</sup>

Despite the high prevalence, potential consequences, modifiable risk factors, and effective interventions, there had been very few Indian studies on burnout among medical students.<sup>[15,16]</sup> Hence, this study was planned to find the prevalence and correlates of burnout among medical students of a Government Medical College in Kerala. The results could help facilitate organizational efforts and the mentoring practices by the faculty in medical education.

## MATERIALS AND METHODS

A cross-sectional survey was done among the undergraduate medical students of a Government Medical College in Kerala during the months of November and December 2017. A full batch of students (including regulars and repeaters) of 4 professional years, starting from the second year, and a batch of interns were enrolled for the study.

In a study done in Pakistan using the Copenhagen Burnout Inventory (CBI), 30% of the medical students were facing severe burnout.<sup>[2]</sup> Using this estimate and a margin of error of 20%, the sample size calculated was 233 (based on the formula  $(Z\alpha/2)^2 P(1-P)/d^2$ ). In view of the ensuing multivariate analysis, the investigators planned to enroll all the 500 students. The third- and fourth-year students could not be fully traced because of the study leave. Data could also not be collected from a group of interns. Hence, 124 students could not be traced mostly from third- and fourth-year students and interns. Data were collected from 376 students, that is, 75% of the students.

CBI was the primary instrument used.<sup>[17]</sup> “Personal burnout” domain of the CBI was used for the study. Because the domains of work- and client-related burnouts do not directly concern a medical student, they were avoided in this study. The instrument has been validated and extensively used for various caring and noncaring professions. Internal consistency reliability of the instrument was 0.85 for the personal domain of the questionnaire. The personal domain of the questionnaire consists of six items, and they are scored 100, 75, 50, 25, and 0. A summary score is the mean of the individual item scores. Scores of 1–49 are considered “low” burnout, 50–74 “moderate,” 75–99 “high,” and a score of 100 is considered “severe” burnout. For this study, a mean score 50 or above was considered as burnout, as done in previous studies.<sup>[2]</sup> The original instrument in English was used for the study.

Other variables included in the questionnaire, in addition to the sociodemographic data, were grades of physical activity, year of education of the student, regular/repeater status, financial status, the experience of stressful events during the past 6 months, self-reported academic performance, perceived quality of teaching, hobbies/interests, and seeking support from parents or teachers when stressed.

Predictor or correlator variables were measured by single questions, with responses on a Likert scale ranging from 1 to 5. To avoid response bias, the study questionnaire had multiple variables mixed up with the burnout inventory. The CBI items were also transformed to a Likert score ranging from 1 to 5, to maintain the coherence of the instrument.

### Data collection

The questionnaire consisting of the above variables was given to batches of medical students, as a group, for self-administration. Only those students who were willing to participate were included, and informed consent was obtained from them. Data collection was managed by the second author. There were no refusals, and 376 students participated in the survey. Only one response was discarded due to incomplete entry. Thus, 375 students were considered for final analysis.

The data was analyzed by R-GUI 3.4.3 version, a free software for statistical computing.<sup>[18]</sup> CBI scores from 1 to 5 were transformed to scores from 0 to 100. Other ordinal variables such as grades of physical activity, year of education of the student, regular/repeater status, financial status, the experience of major stressful events, self-reported academic performance, perceived quality of teaching, hobbies/interests, and seeking support from parents or teachers were dichotomized based on the median cut-off. The means and percentages were used to summarize data. Because data could not be collected from almost half of the students from the third and fourth years and interns, a comparison of prevalence across the professional years was made. Chi-square test and Fisher's exact test were used for significance testing wherever appropriate. The odds ratio was used for denoting the strength of association. Multivariate analysis was done by logistic regression. An alpha level of 0.05 was maintained throughout the analysis. The variables found to be at 0.10 significance levels in univariate analysis were considered for multivariate analysis.

The study was done after clearance from the Institutional Ethics Committee of the institution. Confidentiality of personal information was maintained. Anonymity was maintained during the data collection. Written informed consent was obtained prior to participation in the study.

## RESULTS

Of the 375 participants, 233 (62%) were females, and 344 (91.5%) were hostellers. The percentages of the second-, third-, fourth-, and final-year students and interns in the sample were 24%, 26.4%, 12.53%, 16%, and 22%, respectively.

The overall prevalence of burnout was 48.53% (95% confidence interval 43.4–53.7). This includes moderate, high, and severe burnout at 44.8%, 3.2%, and 0.5%, respectively. To see whether burnout varied among different academic years, the subgroups of medical students were compared. The percentages of burnout were 52.2%, 47.5%, 38.3%, 45%, and 54.43%, respectively for second-, third-, fourth-, and final-year students, and interns. Although it was found that burnout was less in the fourth-year group, no statistical difference was found across groups (Chi-square value = 9.01,  $df = 7$ ,  $P = 0.25$ ). The study addressed primarily personal characteristics as correlates of burnout. It was found that female gender, exposure to stressors, and dissatisfaction with career option were associated with burnout, both in univariate [Table 1] and multivariate analyses [Table 2], and not maintaining hobbies in univariate analysis alone.

## DISCUSSION

The finding of a prevalence of 48.52% burnout among undergraduate medical students in this study is an estimate consistent with the literature. Most of the studies on medical student burnout had used Maslach Burnout Inventory (MBI),<sup>[11]</sup> CBI, or nonspecific measures. Prevalence estimates centered around 10%–26% when stricter criteria of MBI were used and 37%–50% when liberal criteria of MBI were used.<sup>[19–21]</sup> Based on ‘personal burnout’ domain of CBI, which the investigators used in the study, the prevalence estimate of burnout was around 80% among Malaysian medical students.<sup>[22]</sup> But 47.4% was the estimate of burnout in a group of medical students in Pakistan.<sup>[2]</sup> Reviews had reported that approximately half of the medical students suffer from burnout, similar to the results of this study.<sup>[3]</sup>

Fortunately, despite the similarity of the overall prevalence, the degree of burnout is less in our students compared with the samples of other studies. Severe and high burnout was seen in 31.6% of the Pakistani students, compared with 3.73% in our population.<sup>[2]</sup> The instrument has been the same in both the studies. The reasons behind such a disparity are worth exploring.

To see whether the burnout varied among students of different academic years, the subgroups of medical

**Table 1: Univariate analysis of correlates of burnout**

Variable	Burnout (%) n=182	No burnout (%) n=193	Chi-square	Odds ratio (confidence intervals)	P
Female gender	124 (68.1)	109 (56.5)	4.92	1.65 (1.08-2.51)	0.026
Participation in regular exercise	131 (72%)	154 (79.8%)	2.72	0.65 (0.40-1.05)	0.098
Having hobbies	111 (61)	139 (72)	4.64	0.61 (0.39-0.94)	0.031
Repeater status	72 (60.4)	86 (55.4)	0.77	1.23 (0.80-1.89)	0.381
Good financial status	143 (78.6)	156 (80.8)	0.17	0.87 (0.51-1.48)	0.678
Stressors	171 (94)	140 (72.5)	28.86	5.86 (2.89-12.93)	<0.001
Good academic performance	139 (76.4)	155 (80.3)	0.64	0.79 (0.47-1.34)	0.423
Seek support	107 (58.8)	108 (56)	0.20	1.12 (0.73-1.78)	0.653
MBBS by choice	91 (50)	121 (62.7)	6.14	0.59 (0.39-0.92)	0.016
Satisfaction with teaching	160 (87.9)	170 (88.1)	-	0.98 (0.50-1.93)	1.000
Substance abuse	14 (7.7)	13 (6.7)	0.02	1.15 (0.49-2.75)	0.874
Hosteller	167 (91.7)	177 (91.8)	-	0.99 (0.44-2.22)	1.000
Lower age (<22 years)	41 (22.5)	38 (19.7)	0.03	1.19 (0.70-2.01)	0.584

**Table 2: Multivariate analysis of correlates of burnout by logistic regression - Main effects model**

Variable	Coefficient	Standard error	Z	Significance levels	Odds ratio (95% CI)
MBBS by choice	-0.617	0.225	-2.74	0.006	0.54 (0.35-0.84)
Stressors	1.801	0.359	5.02	<0.001	6.06 (3.00-12.2)
Female gender	0.466	0.234	1.99	0.046	1.59 (1.01-2.52)
Exercise	-0.299	0.260	-1.15	0.25	0.74 (0.44-1.23)
Hobbies	-0.441	0.237	-1.86	0.063	0.64 (0.40-1.02)

CI – Confidence interval. Change in  $-2 \log$ -likelihood=50.31,  $P<0.001$ , Hosmer and Lemeshow Chi-square=5.22,  $P=0.73$

students were compared. There was no statistically significant difference across the groups. This was not in accordance with previous studies on burnout.<sup>[4]</sup> In previous studies, it had been found that senior medical students had more burnout. But in this study although statistically not significant, the distribution is bimodal: early years and final years were associated with more burnout, with a lesser peak during intermediate years. This difference should be interpreted with caution because the response rate was poor for intermediate-year students.

The study found that female gender, exposure to stressors, and dissatisfaction with career option are associated with burnout, both in univariate [Table 1] and multivariate analyses [Table 2], and not maintaining hobbies in univariate analysis alone.

The association of burnout with female gender had been consistently reported in the literature.<sup>[2,23,24]</sup> Negative life events had more impact on female students than their male counterparts in terms of both frequency and intensity.<sup>[25]</sup> Moreover, female medical students are more stressed during contact with patients and autopsy more frequently than male students.<sup>[24]</sup> Interventions specific to female gender are needed to prevent and ameliorate burnout among them.

Burnout has been described in association with stressful life experiences.<sup>[26]</sup> Such a relationship has been demonstrated by this study also. Previous studies have

reported that students who regretted choosing medical studies have higher burnout scores than students who were comfortable with the medical discipline as their chosen career path.<sup>[27]</sup> Choosing medical discipline based on one's own interest was assessed in this study for its relationship with burnout. Burnout was found significantly related to an enforced choice. Whether it is a falsified response to the current dissatisfaction with the choice of medicine is to be examined.

It had been shown among physicians and residents that regular engagement in hobbies, recreation, or physical exercise reduces the chance of burnout.<sup>[3]</sup> We found that maintaining regular hobbies and interests is protective against burnout.

Substance use was not related to burnout. It may be because medical students form too young a group to have problematic substance use. However, psychological distress and suicidal ideation were found to be associated with alcohol use in a study done among college students in Kerala.<sup>[28]</sup> Financial status was also not associated with burnout, unlike in previous studies. The personal strategy of seeking support from parents and teachers, staying away from parents (being hosteller), and advancing age were also not associated with burnout.

The learning environment- and curriculum-related variables, as assessed by perception about the quality of teaching, perception about the academic performance,



and failure in the professional examination, were not found to be associated with burnout. It may be because the students are uniformly exposed to such factors and the measurements were not sensitive enough to pick up the subtleties.

### Limitations

The study had certain limitations. Students from a single institution only were enrolled. The sample represents two sources of students: one group which had joined the course while the institution was self-financing (later professional years) and the other while the institution had become government-sponsored (earlier professional years). How this factor had affected the study is not known. The study focused on the personal variables than on the learning environment- and curriculum-related factors. This was an inherent fallacy of the design because the students are uniformly exposed to these variables. Comparing institutions with different learning environments or trend studies may shed better light on the impact of the learning environment and curriculum factors. A subgroup of students from fourth and final years and another subgroup of interns were not enrolled into the study, but by comparing the prevalence across the groups, the above lacunae were at least partially circumvented. Although hosteller status was not found to be associated with burnout, the study did not evaluate the real impact of cultural adaptation and homesickness.

Even with these limitations, the study could offer, with reasonable precision, an estimate of burnout among the medical students. Because it is a cross-sectional study, the correlates we found may not be true causal factors. Still, certain key variables important in the prevention of student burnout were delineated for future research.

### CONCLUSION AND RECOMMENDATIONS

Almost half of the medical students are afflicted with burnout, which has immediate and long-lasting consequences. Certain variables such as female gender, the experience of stressors, and dissatisfaction with the choice of profession are associated with medical student burnout. Personal strategies of stress management like engaging in hobbies are associated with less burnout. Aptitude testing at entry, inculcating programs for self-care in the curriculum (reduction of stress and fatigue), facilitating self-awareness of burnout, and maintaining health and personal interests, work–life balance, and adaptive coping strategies when faced with stressors (e.g., positive reframing, problem solving) may be useful for primordial and primary prevention. Interventions like peer-facilitated support program have also been found to be effective in reducing student distress.<sup>[29]</sup> More comparative studies, which could address the

learning environment- and curriculum-related variables, could bring up a better causal model of medical student burnout. Qualitative research designs could also bring in a better conceptualization of the phenomenon.

The undergraduate curriculum in India is being modified to more of a competency-based one. Emotional factors, stress, and burnout among medical graduates need to be addressed in the above curriculum. Salient modifications in the curriculum like foundation program, electives, and programs for communication skill enhancement could prevent student stress and burnout. The study helps emphasize the need for the above components in the undergraduate curriculum.

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### Conflicts of interest

There are no conflicts of interest.

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