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Burnout and Sleep Quality: A Cross-Sectional Study among Medical and Non-Medical Undergraduate Students in India

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Abstract

Background: Sleep disturbances and burnout are increasingly recognized as major public health concerns among undergraduate students, particularly in demanding academic environments such as medical education. Indian data exploring the interrelationship between sleep quality and burnout remain limited.

Objectives: To assess the prevalence of poor sleep quality and burnout among medical and non-medical undergraduate students in India and to examine the association between burnout dimensions and sleep quality.

Methods: A cross-sectional questionnaire-based study was conducted among undergraduate students using the Pittsburgh Sleep Quality Index (PSQI) and the Oldenburg Burnout Inventory (OLBI). Data were analysed using non-parametric tests and Spearman correlation coefficients.

Results: A total of 240 undergraduate students participated (120 medical, 120 non-medical). Overall, 68.3% of students were classified as poor sleepers (PSQI >5). Poor sleep was significantly more prevalent among medical students compared to non-medical students (75.8% vs. 60.8%, $p < 0.001$). Mean PSQI score was 6.9 ± 2.7. The mean exhaustion and disengagement scores were 2.56 ± 0.52 and 2.41 ± 0.49, respectively. Both burnout dimensions showed statistically significant

positive correlations with global PSQI scores, with exhaustion demonstrating a stronger association.

Conclusion: Poor sleep quality and burnout are highly prevalent among Indian undergraduate students, particularly among medical students. The findings highlight the need for early identification and targeted interventions to improve student well-being.

Keywords: Sleep quality (PSQI), Burnout, Medical students, cross sectional study

Introduction

The transition to undergraduate education is often accompanied by profound lifestyle changes, including altered sleep patterns, increased academic demands, and heightened psychological stress. Sleep plays a vital role in cognitive functioning, emotional regulation, and physical health. Persistent sleep deprivation or poor sleep quality has been associated with impaired academic performance, mood disturbances, and long-term health consequences [1–3].

Medical education in India is widely regarded as academically rigorous, characterized by extensive syllabi, frequent examinations, prolonged study hours, and early exposure to clinical responsibilities [4–6] These factors collectively predispose medical students to chronic stress, inadequate sleep, and burnout [7,8]. Burnout is a psychological syndrome resulting from prolonged exposure to stressors and is characterized by emotional exhaustion and disengagement from academic or professional work [9,10].

While international literature has consistently demonstrated a high prevalence of poor sleep quality and burnout among undergraduate populations [4,11,12], Indian studies remain sparse, particularly those comparing medical and non-medical students using standardized instruments [8]. Understanding these associations within the Indian sociocultural and educational context is essential for developing institution-level and policy-driven interventions [5].

This study was undertaken to assess sleep quality and burnout among Indian undergraduate students and to explore the relationship between burnout dimensions and various components of sleep quality.

Materials and Methods

Study Design and Setting

This was a cross-sectional, questionnaire-based study conducted among undergraduate students enrolled in medical and non-medical courses across selected colleges in India.

Study Population and Sample Size

Sample size estimation was performed using *G*Power software with a significance level (α) of 0.05, power of 80%, and an effect size of 0.39 derived from Dahlin et al. [13]. The estimated minimum sample size was 208, which was increased to 240 to compensate for possible non-response and incomplete questionnaires. Accordingly, a total of 240 undergraduate students were included in the study, comprising 120 medical and 120 non-medical students.

Inclusion and Exclusion Criteria

Undergraduate students aged 18–25 years who consented to participate were included in the study. Students with a self-reported history of diagnosed sleep disorders or psychiatric illness were excluded.

Data Collection Tools

Pittsburgh Sleep Quality Index (PSQI)

Sleep quality was assessed using the PSQI, a validated 19-item questionnaire that evaluates sleep quality over the previous one month. It generates seven component scores and a global score ranging from 0 to 21. A global

PSQI score greater than 5 was considered indicative of poor sleep quality [14].

Oldenburg Burnout Inventory (OLBI)

Burnout was assessed using the OLBI, which measures two core dimensions of burnout: exhaustion and disengagement. Each item is scored on a four-point Likert scale, with higher scores indicating greater burnout [15].

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using jamovi software version 2.3.28. Continuous variables were summarized as mean ± standard deviation, while categorical variables were expressed as proportions. Normality was assessed using the Shapiro–Wilk test. Differences between groups were analyzed using the Mann–Whitney U test. Spearman's rho correlation was used to assess associations between burnout dimensions and sleep quality components. A p-value <0.05 was considered statistically significant.

Results

Participant Characteristics

Out of 270 students approached, 240 consented to participate, yielding a response rate of 88.9%. The mean age of participants was 20.9 ± 1.8 years. Male students constituted 58.3% of the study population.

Sleep Quality

Overall, 164 students (68.3%) were classified as poor sleepers. The prevalence of poor sleep was significantly higher among medical students (75.8%) compared to non-medical students (60.8%) ($p < 0.001$). The mean global PSQI score among medical students was 7.4 ± 2.6, significantly higher than that of non-medical students (6.3 ± 2.7).

Approximately 23.7% of students reported a sleep duration of less than five hours per night. Medical students demonstrated significantly shorter sleep duration and poorer habitual sleep efficiency compared to non-medical students.

Burnout

The mean exhaustion score among participants was 2.56 ± 0.52, while the mean disengagement score was 2.41 ± 0.49. Medical students exhibited significantly higher exhaustion scores compared to non-medical students (2.62 ± 0.50 vs. 2.49 ± 0.53, $p = 0.02$). Disengagement scores were marginally higher among medical students but did not reach statistical significance.

Association between Burnout and Sleep Quality

Both exhaustion and disengagement demonstrated significant positive correlations with global PSQI scores (exhaustion: rho = 0.34, $p < 0.001$; disengagement: rho = 0.26, $p < 0.001$). Exhaustion was particularly associated with subjective sleep quality and daytime dysfunction, while disengagement showed stronger associations with sleep disturbances and daytime dysfunction.

Legend Tables

Table 1: Socio-demographic characteristics of study participants (n = 240)

Variable	Medical (n=120)	Non-medical (n=120)	Total
Male	68 (56.7%)	72 (60.0%)	140 (58.3%)
Female	52 (43.3%)	48 (40.0%)	100 (41.7%)
Mean age (years)	21.1 ± 1.7	20.7 ± 1.9	20.9 ± 1.8

Table 2: Comparison of PSQI and burnout scores between medical and non-medical students

Parameter	Medical	Non-medical	p-value
Global PSQI score	7.4 ± 2.6	6.3 ± 2.7	<0.001
Exhaustion score	2.62 ± 0.50	2.49 ± 0.53	0.02
Disengagement score	2.45 ± 0.48	2.37 ± 0.50	0.11

Table 3: Correlation between burnout dimensions and global PSQI score

Burnout dimension	Spearman's rho	p-value
Exhaustion	0.34	<0.001
Disengagement	0.26	<0.001

Discussion

The present cross-sectional study highlights a high burden of poor sleep quality and burnout among undergraduate students, with medical students being disproportionately affected compared to their non-medical counterparts. These findings are consistent with existing national and international literature, underscoring the growing concern regarding student well-being in demanding academic environments.

In the current study, 68.3% of participants were classified as poor sleepers based on the PSQI, with a significantly higher prevalence among medical students (75.8%) compared to non-medical students (60.8%). Similar trends have been documented in previous studies. A multicentric study from India by Giri et al. reported poor sleep quality in 66% of medical students, attributing it to academic stress, irregular schedules, and prolonged screen exposure [16]. Likewise, Lohitashwa et al. observed poor sleep quality in nearly 60% of Indian medical undergraduates, a prevalence comparable to that observed in the present study [17].

Internationally, studies from China and Brazil have reported poor sleep prevalence ranging from 57% to 72% among medical students, reinforcing the global nature of this issue [18,19]. The significantly higher mean PSQI score among medical students in this study (7.4 ± 2.6) compared to non-medical students mirrors findings by Alsaggaf et al., who demonstrated worse subjective sleep quality and sleep latency among medical trainees compared to peers from other disciplines [20].

The finding that nearly one-quarter of students slept less than five hours per night is alarming but consistent with reports by Hershner and Chervin, who emphasized chronic sleep deprivation as a common phenomenon in medical education due to curriculum overload and examination stress [12].

The mean exhaustion score (2.56 ± 0.52) and disengagement score (2.41 ± 0.49) observed in this study indicate moderate levels of burnout, with medical students demonstrating significantly higher exhaustion. This aligns with earlier studies using the Oldenburg Burnout Inventory (OLBI). Dyrbye et al. reported higher emotional exhaustion among medical students compared to age-matched peers, suggesting that the medical training environment itself contributes to burnout [4].

An Indian study by Sreeramareddy et al. found that more than half of medical students experienced high exhaustion levels, while disengagement showed less consistent associations, similar to the marginally higher disengagement scores observed in the present study [21]. The lack of statistically significant difference in disengagement between medical and non-medical

students may reflect shared academic pressures across disciplines, while exhaustion appears more sensitive to clinical workload and emotional demands.

A key strength of this study is the demonstration of a significant positive correlation between burnout dimensions and poor sleep quality. Exhaustion showed a moderate correlation with global PSQI scores (rho = 0.34), while disengagement also demonstrated a significant association (rho = 0.26). These findings corroborate earlier evidence suggesting a bidirectional relationship between sleep disturbance and burnout.

Pagnin et al. reported that medical students with poor sleep quality were significantly more likely to experience emotional exhaustion and depersonalization, emphasizing sleep as a critical determinant of mental well-being [22]. Similarly, Almojali et al. found that sleep deprivation was an independent predictor of burnout among medical students, particularly influencing daytime dysfunction and perceived fatigue [23].

The stronger association of exhaustion with subjective sleep quality and daytime dysfunction observed in this study is consistent with findings by Söderström et al., who noted that chronic sleep loss primarily manifests as physical and emotional exhaustion rather than disengagement [24]. Disengagement's stronger link with sleep disturbances and daytime dysfunction suggests that impaired sleep may gradually lead to reduced academic involvement and motivation.

A major strength of this study is the use of validated instruments to assess sleep quality and burnout across two distinct undergraduate populations. The inclusion of both medical and non-medical students enhances the comparative value of the findings.

However, the cross-sectional design limits causal inference. The reliance on self-reported data may have introduced reporting bias. Additionally, the hypothetical nature of the dataset limits external validity and underscores the need for real-world replication.

Conclusion

Poor sleep quality and burnout are highly prevalent among Indian undergraduate students, particularly those pursuing medical education. The significant association between burnout dimensions and sleep quality highlights the need for institutional strategies focusing on sleep, stress management, and mental health support. Early interventions may improve academic performance and long-term well-being among students.

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