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Original Research

Evaluation of Sleep Quality and Academic Performance among Final-Year MBBS Students

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Abstract
Background: Sleep quality is a critical determinant of cognitive function and academic performance, especially among medical students facing rigorous academic demands. Disrupted sleep patterns are commonly reported in this group, potentially impacting their learning outcomes. This study aimed to assess the association between sleep quality and academic performance in final-year MBBS students.
Materials and Methods: A cross-sectional study was conducted among 150 final-year MBBS students from a tertiary medical college. Sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI), and academic performance was measured using recent internal examination scores. Students were categorized into good sleepers (PSQI score ≤5) and poor sleepers (PSQI score >5). Statistical analysis was performed using SPSS v26, and Pearson's correlation and independent t-tests were used to assess relationships between sleep quality and academic scores.
Results: Out of 150 participants, 92 (61.3%) were identified as poor sleepers. The mean PSQI score for the entire cohort was 7.1 ± 2.6. Students with poor sleep quality had significantly lower academic scores (mean = 58.3 ± 6.9) compared to those with good sleep quality (mean = 64.7 ± 7.2), $p< 0.01$. A moderate negative correlation (r = –0.42, $p< 0.001$) was found between PSQI scores and academic performance.
Conclusion: Poor sleep quality is highly prevalent among final-year MBBS students and is significantly associated with reduced academic performance. Interventions to improve sleep hygiene may contribute to better learning outcomes in medical education.
Keywords: Sleep quality, academic performance, MBBS students, PSQI, cognitive function, medical education

Introduction

Sleep plays a vital role in maintaining physical health, emotional well-being, and cognitive performance. Adequate and good-quality sleep is particularly important for students in demanding academic environments such as medical colleges. Sleep is essential for memory consolidation, learning, and the ability to focus and perform complex cognitive tasks (1). However, numerous studies have reported a high prevalence of poor sleep quality among medical students, which may negatively affect their academic achievements and mental health (2,3).

Medical education, especially during the final year, is characterized by long hours of clinical postings, frequent examinations, and increased psychological pressure. These factors contribute to irregular sleep patterns, reduced sleep duration, and increased sleep disturbances (4). Sleep deprivation and poor sleep hygiene have been associated with impaired attention, decreased problem-solving abilities, and poor academic outcomes (5). Furthermore, medical students may underprioritize sleep in favor of academic pursuits, leading to a detrimental cycle that affects both their health and performance (6).

The Pittsburgh Sleep Quality Index (PSQI) is a validated tool widely used to assess sleep quality and disturbances over a one-month period (7). Several cross-sectional studies have used PSQI to evaluate the sleep patterns of medical students and correlate them with academic performance, revealing significant associations (8,9). Despite increasing awareness, sleep hygiene is not routinely emphasized in medical training.

Given the paucity of region-specific data and the intense academic demands on final-year MBBS students, it is essential to explore this relationship

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further. This study aims to assess the quality of sleep and its correlation with academic performance among final-year MBBS students in a tertiary care medical institution.

Materials and Methods

Study Design and Setting: A cross-sectional analytical study was conducted over a period of two months among final-year MBBS students at a tertiary care teaching medical institution in India. Participation was voluntary and informed consent was obtained from all students.

Study Population and Sampling: The study included a total of 150 final-year MBBS students selected through convenience sampling. Inclusion criteria were students currently enrolled in the final year, aged between 21 and 25 years, and willing to participate. Students with known psychiatric illnesses, on medications affecting sleep, or with chronic medical conditions were excluded.

Data Collection Tools: Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), a standardized and validated questionnaire that evaluates subjective sleep quality over the past month. It consists of 19 self-rated questions and 5 questions rated by a roommate or bed partner (if available), although only the self-rated items were considered in this study. A global PSQI score >5 was indicative of poor sleep quality.

Academic performance was assessed by collecting the most recent internal assessment scores from departmental records, expressed as percentage marks out of 100. These scores were used as a proxy for academic achievement.

Procedure: Participants completed the PSQI questionnaire anonymously in a supervised setting to ensure independent responses. The PSQI scores were then categorized into two groups: good sleepers (score ≤5) and poor sleepers (score >5). Academic scores were matched with the corresponding PSQI data for analysis.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using IBM SPSS version 26.0. Descriptive statistics such as means and standard deviations were used to summarize continuous variables. The independent t-test was used to compare academic performance between good and poor sleepers. Pearson's correlation coefficient was employed to assess the relationship between PSQI scores and academic performance. A p-value <0.05 was considered statistically significant.

Results

A total of 150 final-year MBBS students participated in the study, of which 83 (55.3%) were male and 67 (44.7%) were female. The mean age of participants was 22.6 ± 0.8 years. Based on PSQI scores, 58 students (38.7%) were categorized as good sleepers (PSQI ≤ 5), while 92 students (61.3%) were identified as poor sleepers (PSQI > 5).

Table 1 summarizes the distribution of PSQI scores and academic performance. The mean PSQI score of the cohort was 7.1 ± 2.6, while the overall mean academic score was 60.8 ± 7.3. Good sleepers had a significantly higher mean academic score (64.7 ± 7.2) compared to poor sleepers (58.3 ± 6.9) (p< 0.01).

Table 1: Sleep Quality and Academic Performance among Final-Year MBBS Students (n = 150)

Parameter	Good Sleepers (n = 58)	Poor Sleepers (n = 92)	*p*-value
Mean PSQI Score	4.2 ± 0.8	8.6 ± 2.3	<0.001
Mean Academic Score (%)	64.7 ± 7.2	58.3 ± 6.9	<0.01

As seen in Table 1, students with poor sleep quality showed significantly lower academic scores. Further correlation analysis demonstrated a moderate negative correlation between PSQI scores and academic performance (r = –0.42, p< 0.001), indicating that as sleep quality deteriorates, academic performance tends to decline.

Additional analysis of sleep components revealed that sleep latency and sleep disturbances were the most commonly affected domains in the poor sleeper group (Table 2).

Table 2: Distribution of Sleep Components in Poor Sleepers (n = 92)

Sleep Component	Frequency (%)
Prolonged Sleep Latency	66 (71.7%)
Frequent Night Awakenings	54 (58.7%)
Daytime Dysfunction	48 (52.2%)
Poor Subjective Sleep	36 (39.1%)
Short Sleep Duration	30 (32.6%)

As indicated in **Table 2**, the most prevalent issues contributing to poor sleep included delayed sleep onset and fragmented sleep patterns.

Discussion

The present study highlights a significant association between poor sleep quality and reduced academic performance among final-year MBBS students. A majority (61.3%) of the participants were classified as

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poor sleepers based on PSQI scores, aligning with previous reports that suggest sleep disturbances are prevalent among medical students due to academic stress, irregular schedules, and clinical duties (1,2).

The negative correlation found between PSQI scores and academic performance in our study ($r = –0.42$) is consistent with findings from other cross-sectional investigations. For example, studies conducted by Giri et al. and Alotaibi et al. have demonstrated that medical students with poor sleep quality tend to perform poorly in academic assessments (3,4). Sleep quality affects memory consolidation, attention span, and executive functioning, which are essential for academic learning (5,6).

One possible explanation for the high prevalence of poor sleep quality is the demanding nature of medical education, especially during the final year, which includes preparation for exit exams and continuous clinical responsibilities (7). These stressors contribute to increased sleep latency, frequent awakenings, and shortened sleep duration, as also noted in our subgroup analysis. These sleep components have been associated with impaired concentration and emotional instability in other research as well (8,9).

Daytime dysfunction, another key component of poor sleep quality in our participants, has been linked to decreased productivity, irritability, and burnout among healthcare students (10). Additionally, prolonged sleep deprivation may lead to higher levels of cortisol and disruption in circadian rhythm, impairing cognitive performance over time (11,12).

The association between sleep and academic success has also been supported by studies involving students from non-medical disciplines. Gilbert and Weaver found that poor sleepers among undergraduate students scored significantly lower on standardized assessments, regardless of the field of study (13). This suggests that sleep quality is a universal determinant of learning efficiency and not limited to the medical education context.

Moreover, psychological comorbidities such as anxiety and depression, although not assessed in our study, are frequently linked to disturbed sleep in medical students (14). Addressing these factors through wellness programs, time management workshops, and sleep hygiene education may improve both sleep and academic outcomes (15).

This study's limitations include its cross-sectional design, which prevents causal inference, and the use of internal assessment scores, which may not fully capture academic performance. Furthermore, self-reported sleep measures may be subject to recall bias.

Conclusion

Poor sleep quality is highly prevalent among final-year MBBS students and is significantly associated with reduced academic performance. The study emphasizes the need for institutional strategies to promote healthy sleep behaviors. Integrating mental health support, flexible academic scheduling, and awareness on sleep hygiene could enhance students' overall well-being and academic potential.

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