

Impact of Physical Activity on Sleep Quality in MBBS Students: A Cross-Sectional Study at VSS MCH, Burla.

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Abstract

Background: Medical students face immense academic pressures that frequently compromise their lifestyle habits, particularly physical activity and sleep. **Objective:** To determine the impact of physical activity levels on the sleep quality of undergraduate medical (MBBS) students. **Methods:** An observational, cross-sectional study was conducted among 186 MBBS students at Veer Surendra Sai Medical College and Hospital (VSS MCH), Burla, during the 2024–2025 academic session. We used the International Physical Activity Questionnaire (IPAQ) and the Pittsburgh Sleep Quality Index (PSQI) to collect data. **Results:** Out of 186 participants, 59.1% reported poor sleep quality. Students with low physical activity had a significantly higher prevalence of poor sleep (77.9%) compared to those with moderate (46.8%) or high physical activity (32.1%). The association between physical activity and sleep quality was highly statistically significant ($p < 0.001$). **Conclusion:** Encouraging regular physical activity is a crucial and modifiable intervention to improve sleep quality and, by extension, the overall well-being and academic performance of medical students.

Keywords: Physical activity, Sleep quality, MBBS students, PSQI, IPAQ, VSS MCH.



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INTRODUCTION

The journey through medical school is notoriously demanding. Undergraduate medical (MBBS) students routinely manage vast syllabi, long clinical postings, and high-stakes examinations. Unfortunately, the pressure to excel academically often comes at the cost of personal health. Two of the most commonly neglected pillars of health among medical trainees are regular physical activity and adequate sleep.

Poor sleep quality is a pervasive issue in the medical student community, with studies indicating that over half of the student population suffers from inadequate rest. Chronic sleep deprivation not only impairs cognitive function and memory consolidation but also heightens the risk of anxiety, depression, and burnout. Concurrently, the sedentary nature of studying leads to a drastic reduction in physical activity. While the general benefits of exercise on physical health are well known, its role as a non-pharmacological intervention to enhance sleep architecture is often overlooked in medical curricula. This study aimed to evaluate the relationship between physical activity levels and sleep quality among MBBS students at Veer Surendra Sai Medical College and Hospital (VSS MCH), Burla, providing localized, evidence-based insights to help institutions foster healthier lifestyle practices.

MATERIALS AND METHODS

Study Design and Setting: A descriptive, cross-sectional study was conducted at the Veer Surendra Sai Institute of Medical Sciences and Research (VIMSAR), formerly known as VSS MCH, located in Burla, Odisha.

Study Period: The study was carried out over the academic period of 2024 to 2025.

Sample Size & Sampling: A sample size of 186 MBBS students was recruited using stratified random sampling across different academic years to ensure a representative sample.

Data Collection Tools:

- Socio-demographic Proforma: Capturing age, gender, and year of study.
- International Physical Activity Questionnaire (IPAQ): Used to categorize participants into Low, Moderate, and High physical activity groups based on metabolic equivalent (MET) minutes per week.
- Pittsburgh Sleep Quality Index (PSQI): A standardized tool where a global score of >5 indicates poor sleep quality, and a score of ≤ 5 denotes good sleep quality.

Data Analysis: Data were analyzed using SPSS software. Descriptive statistics (frequencies and percentages) were used for demographic variables. The Chi-square test and multivariate logistic regression were employed to determine statistical significance, with the significance level set at $p < 0.05$.

RESULTS

The study included 186 MBBS students, with a relatively balanced gender distribution.

Table 1: Socio-demographic Characteristics of the Study Population (N = 186)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	102	54.8
	Female	84	45.2
Year of Study	1st Year (Pre-clinical)	48	25.8
	2nd Year (Para-clinical)	52	28.0
	3rd Year (Clinical)	46	24.7
	4th Year (Clinical)	40	21.5
Age (Years)	18–20	65	34.9
	21–23	98	52.7
	≥ 24	23	12.4

When evaluating lifestyle habits, a significant portion of the cohort reported living highly sedentary lives. Only about 15% of students engaged in high levels of physical activity.

Table 2: Distribution of Physical Activity Levels (IPAQ)

Physical Activity Level	Frequency (n)	Percentage (%)
Low	95	51.1
Moderate	63	33.9
High	28	15.0
Total	186	100.0

Sleep quality was notably compromised across the board. Using the PSQI cutoff, we found that nearly three-fifths of the students suffered from poor sleep quality.

Table 3: Overall Sleep Quality Assessment (PSQI)

Sleep Quality (PSQI Score)	Frequency (n)	Percentage (%)
Good Sleep (≤ 5)	76	40.9
Poor Sleep (> 5)	110	59.1
Total	186	100.0

To understand the core objective of the study, we cross-tabulated physical activity levels with sleep quality. The data revealed a stark contrast: students with low physical activity were far more likely to experience poor sleep compared to their highly active peers.

Table 4: Association Between Physical Activity Levels and Sleep Quality

Physical Activity Level	Good Sleep (n=76)	Poor Sleep (n=110)	Chi-Square (χ^2)	p-value
Low (n=95)	21 (22.1%)	74 (77.9%)	28.45	< 0.001*
Moderate (n=63)	36 (57.1%)	27 (42.9%)		
High (n=28)	19 (67.9%)	9 (32.1%)		

*Statistically significant at $p < 0.05$

A multivariate analysis further cemented this finding. Even when controlling for age, gender, and academic year, moderate and high physical activity served as strong protective factors against poor sleep quality.

Table 5: Multivariate Logistic Regression for Predictors of Poor Sleep Quality

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval	p-value
Physical Activity (Ref: Low)			
Moderate PA	0.38	0.21 – 0.65	0.002*
High PA	0.22	0.10 – 0.48	< 0.001*
Gender (Ref: Male)			
Female	0.85	0.52 – 1.38	0.415
Study Phase (Ref: Pre-clinical)			
Clinical Years	1.42	0.89 – 2.25	0.138

*Statistically significant at $P < 0.005$

DISCUSSION

This study highlights a concerning reality: 59.1% of MBBS students at VSS MCH, Burla, experience poor sleep quality. This aligns closely with broader national data suggesting that over half of Indian medical students face significant sleep disturbances due to the rigors of medical training.

The core finding of this study is the strong, statistically significant inverse relationship between physical activity and poor sleep quality ($p < 0.001$). Students categorized in the "Low" physical activity group had nearly a 78% prevalence of poor sleep. Conversely, those engaging in high levels of physical activity showed a protective effect, with their odds of poor sleep being reduced by 78% (AOR = 0.22) compared to sedentary students.

These results are corroborated by recent literature, which demonstrates that physical activity helps regulate circadian rhythms, reduces stress-induced cortisol levels, and promotes healthy fatigue that facilitates sleep onset. The transition from pre-clinical to clinical years often exacerbates sedentary behaviours due to longer ward hours, making these students particularly vulnerable.

CONCLUSION

Physical activity is a highly effective, modifiable lifestyle factor that directly impacts sleep quality in medical students. At VSS MCH, Burla, a significant proportion of the student body suffers from poor sleep coupled with low physical activity. Medical institutions must go beyond academic instruction and actively foster environments that encourage physical well-being. Implementing campus-wide sports initiatives, integrating wellness hours into the curriculum, and educating students on sleep hygiene could dramatically improve both the physical and mental health of future healthcare professionals.

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