

SLEEP QUALITY AND ITS RELATION WITH ACADEMIC PERFORMANCE AMONG UNDERGRADUATE MEDICAL STUDENTS: A CROSS SECTIONAL STUDY

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ABSTRACT

Background: Sleep is an active, reversible phenomenon during which several behavioral, physiological and neuro-cognitive processes occur. Poor sleep adversely affects physical and mental health of an individual and higher intellectual functions, including learning and memory. Medical students often suffer from poor sleep quality, which is significantly higher than that among students pursuing other courses and the general population. This study was conducted to study the prevalence of poor sleep quality among Phase1 MBBS students (2025-26) of Jorhat Medical College & Hospital, Assam and its impact on their study and academic performance. **Materials and Methods:** This cross sectional study was conducted using Pittsburg Sleep Quality Index, a self-administered questionnaire among 125 no of Phase1 MBBS students (2025-26) of Jorhat Medical College & Hospital, Assam. The marks (Theory+Practical) secured in 1st Internal Assessment held in January 2026 were calculated first in percentage then the percentage was converted into Grade Point Average on 4 point scale. The prevalence & distribution of sleep quality and academic performance was measured. Data were presented in Mean±SD and percentage. P value and Pearson's Correlation coefficient were calculated to find the relation between sleep quality and the academic performance. **Result:** After statistical analysis, it was found that sleep quality and academic performance of the Phase1 MBBS students were negatively correlated which was statistically significant. **Conclusion:** Sleep quality affects the academic performance of medical students.

INTRODUCTION

Sleep is an active, repetitive and reversible phenomenon during which several behavioral, physiological and neuro-cognitive processes occur.^[1,2] Poor sleep adversely affects physical and mental health and higher intellectual functions, including learning and memory.^[3] As various studies prove, the positive effects of sleep depend on sleep quality. Sleep quality is defined as one's satisfaction with the experience, which integrates aspects of sleep initiation, maintenance, quantity, and awakening refreshment.^[4] Good quality sleep promotes memory consolidation by strengthening the synaptic connections which were active during the awake state. In contrast, lack of sleep drifts our focus, attention and vigilance, making the knowledge acquisition process difficult.^[5-7] Insufficient sleep, is characterized by an inadequate duration and quality of sleep, and has been shown to exhibit a variety of detrimental effects on numerous

health conditions, including but not limited to cardiovascular diseases, neuro-cognitive functioning, psychological disorders, levels of empathy and interpersonal skills, metabolic abnormalities, immunological response, and academic performance.^[8-10] The American Academy of Sleep Medicine, in conjunction with the Sleep Research Society, advocates for a minimum 7 hours of nocturnal sleep for adults, while endorsing a duration of up to 9 hours of sleep per night for adolescents and younger adults in order to foster optimal health outcomes.^[8] Despite the fact that this particular recommendation has been put forth with the intention of promoting better sleep habits, a substantial amount of empirical evidence clearly demonstrates that roughly one third of the entire global population is not able to meet the recommended duration of sleep that is deemed necessary for optimal health and well-being.^[9,11] Sleep deprivation studies in laboratory settings and the comfort of home have documented significantly

more fatigue, sleepiness and poor cognitive performance among persistent poor sleepers.^[12,13] Poor sleep is highly prevalent among the general population worldwide.^[14-16] Medical students often suffer from poor sleep quality,^[17-21] which is significantly higher than that among students pursuing other courses and the general population.^[22,23]

Numerous studies and research investigations have consistently reported and emphasized that experiencing sleep disorders or having poor quality of sleep among medical students can significantly have a detrimental impact on a wide range of important aspects; which includes overall academic performance, cognitive functioning, emotional and mental well-being, physical health, all of which may lead to various long-term negative consequences thus affecting their future professional lives.^[24-30]

Such studies are going on across different countries as well as in different parts of India. However there is a paucity of such type of studies in Assam and North East India. Therefore this study has been conceptualized with the aim to evaluate the prevalence of poor sleep quality among medical students and how it affect their academic performance.

Objectives:

1. To determine the sleep quality of Phase I MBBS students using Pittsburg Sleep Quality Index
2. To record the academic performance in percentage and convert it into Grade Point Average scale
3. To find out the relation between PSQI and the Academic performance of the students.

MATERIALS AND METHODS

Ethical Clearance: SMEJ/JMCH/MEU/841/Pt-III/2023/4147 dated 16/09/2025 of Jorhat Medical College & Hospital, Assam

Study design: Cross sectional survey

Study duration: 6 months

Study setting: Department of Physiology, Jorhat Medical College & Hospital, Jorhat

Study sample: Undergraduate medical Students of Phase 1 (2025-26)

Sample size: 125

Inclusion criteria:

1. Males and females
2. Medical students studying in 1st year of MBBS

Exclusion criteria:

Those who refused to be a part of our study (for any reason)

Methodology: After getting the IEC clearance certificate, the study was initiated. All the students were detailed about the procedure and the Pittsburg Sleep Quality Index questionnaire and how to answer them. Both male and female students were included for the study. Students were of the age group 18-24 years.

Pittsburg Sleep Quality Index questionnaire: Sleep quality was assessed by Pittsburg Sleep Quality Index questionnaire.

The Pittsburg Sleep Quality Index (PSQI) is a validated instrument utilized to distinguish between individuals exhibiting suboptimal or optimal sleep quality through the assessment of seven distinct dimensions: subjective sleep quality, sleep latency, sleeps duration, habitual sleep efficiency, sleep disturbances, consumption of sleep medication, and daytime dysfunction experienced over the preceding month. This instrument comprises 19 meticulously formulated questions, each of which is assigned a specific weight and score, culminating in a total score that ranges from 0 to 21. Elevated scores (5-21) are indicative of compromised sleep quality, whereas diminished scores (0-4) suggest favourable sleep quality.^[31]

- 0=never
- 1=almost never
- 2=sometimes
- 3=fairly often
- 4=very often

Individual component scores are added up to obtain the Global PSQI score. Good sleepers have global PSQI score less than or equal to five (PSQI≤5) indicating good sleep quality and the poor sleepers have PSQI score more than five (PSQI>5).^[32]

Academic performance was recorded from the percentage scored by the students in 1st Internal assessment held in the month of January 2026. Total marks (Theory and Practical) obtained by the students out of Total marks 200 (Theory+Practical) was converted to Grade Point Average in 4 point scale and recorded as numerical variables. It was then converted to a categorical variable by subdividing into three groups.^[32]

Academic performance grading as per Grade Point Average GPA:

- Good (GPA=3.01-3.50)
- Average (GPA= 2.51-3.00)
- Poor (GPA= 2.00-2.50).

Conversion of percentage to Grade point average in 4 point scale:

$GPA = (\text{percentage} / 100) \times 4$

If percentage is 90%, then $GPA = (90/100) \times 4 = 3.6$ GPA.

RESULTS

Table 1: Distribution of Good and Bad sleepers

PSQI grading	No of study population	Percentage
Bad sleeper PSQI>5	83	66.4%
Good sleeper PSQI<5	42	33.6%

Table 2: Distribution of GPA Grade Point Average

GPA grading	No of study population	Percentage
<2.5	2	1.6%
2.51-3	6	4.8%
3.01 and more	117	93.6%

Table 3: Mean±SD of PSQI and GPA

Variable	Mean ±SD
PSQI	6.744±2.517
GPA	4.489±0.8913

Table 4: Relationship of PSQI and GPA Grade Point Average

Relation between variables	P value	Level of significance
PSQI with Grade Point Average	.0265	Highly Significant

Table 5: Pearson's correlation Coefficient of PSQI, PSS and Grade Point Average

Relation between variables	Pearson's correlation coefficient	Correlation
PSQI with Grade Point Average	-0.05502	Negative correlation which is statistically highly significant

"p" value <0.05 is taken as significant for showing any relationship.

For showing correlation Pearson's correlation coefficient is taken between the parameters (between -1 to +1).

DISCUSSION

Based on PSQI grading, prevalence of bad sleeper (PSQI>5) was 66.4% while good sleeper was 33.6%. It shows a high prevalence of bad sleep quality. On Grade Point Average scale, poor performance was 1.6%, moderate performance was 4.8% while good performance was 93.6%. On statistical analysis the p value between sleep quality and academic performance was found to be highly significant. Also the Pearson's Correlation Coefficient was -0.05502, that clearly shows a negative correlation, which is statistically highly significant. Similarly findings were reported by several studies.

Hyder Osman Mirghani et al., where medical students with better sleep quality had significantly higher academic grades.^[33] A. Armand and Federica Biassoni, in their cross sectional study among medical students at the University of Singapore, found that good sleep quality was associated with higher academic performance grades only in the presence of higher levels of psychological well-being.^[34] The role of mental well-being as a potent modulator influencing the association between academic performance and sleep quality was brought out in this study. But one study,^[32] failed to find any association between the overall sleep quality and the students' academic performance, though they found habitual sleep efficiency showed a strong positive correlation with the academic performance.

CONCLUSION

Our study is the first of its kind to assess the relationship between poor sleep quality and academic performance among undergraduate medical students in the state of Assam and North-east India. The extent of poor sleep quality among

undergraduate medical students is of concern to all. Sleep hygiene education programs have been shown to improve sleep quality among medical students at the University of Chicago.^[35]

It is noteworthy to mention that two findings,

1.the greater proportion of poor sleepers among medical students

2.the negative relationship between sleep quality and academic performance

These 2 findings observed in our study necessitates the inclusion of sleep hygiene education programs in Indian medical education system. This study also envisages need of good and quality sleep for better academic performance which will also impact the overall wellbeing of the medical students. Our study mostly focused on the academic performance of the medical students. However other aspects of their life such as physical, psychological, intellectual and social well-being; how they are affected by poor sleep quality remain to be evaluated in future studies and this is the need of the hour.

Limitations: The study was conducted among the students of a single medical college Jorhat Medical College of Assam and so the uniformity cannot be ensured. Also several factors could affect the performance of a student on the day of examination which we were not able to control.

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