

# Sleep Patterns, Issues, Reasons for Sleep Problems, and Their Impact on Academic Performance among First-Year Medical Students in Central India

Seema S SUTAY<sup>a</sup>, Nishat Ahmed SHEIKH<sup>b</sup>, Rama Shankar RATH<sup>c</sup>,  
Abhimanyu VASUDEVA<sup>d</sup>

<sup>a</sup>Department of Forensic Medicine, Government Medical College, Khandwa, State Madhya Pradesh, India

<sup>b</sup>Department of Forensic Medicine and Toxicology, All India Institute of Medical Sciences, Gorakhpur, India

<sup>c</sup>Department of Community Medicine and Family Medicine, All India Institute of Medical Sciences, Gorakhpur, India

<sup>d</sup>Department of Physical Medicine and Rehabilitation, All India Institute of Medical Sciences, Gorakhpur, India



## ABSTRACT

**Introduction:** Sleep is an essential part of the human daily routine. Studies have shown that sleep deprivation causes and worsens a wide range of psychological problems in people of all ages. Undergraduate students' sleep disorders are likely to persist and worsen over time. Medical students who work with sick patients on a daily basis and perform skilled activities find that sleep is very important for them.

**Aims and objectives:** The main objective of the present study was to determine undergraduate medical students' sleeping habits as well as the numerous causes of sleep disorders. The secondary aim of our research was to determine the influence of sleep-related problems on students' academic performance.

**Methods:** Following approval from the Ethics Committee, a cross-sectional study of 171 first-year medical students was conducted using a semi-structured self-administered questionnaire. Data was collected using Google Forms on the internet. Microsoft Excel 2019 was used to enter and analyze data. Prevalence was expressed as percentage with a 95% confidence interval. The mean and standard deviation of continuous variables was reported.

Address for correspondence:

Dr. Nishat Ahmed Sheikh, Associate Professor

Department of Forensic Medicine and Toxicology, All India Institute of Medical Sciences, Gorakhpur, Uttar Pradesh, India, Pin code 273008

Email: [drnishatshikh@gmail.com](mailto:drnishatshikh@gmail.com)

Article received on the 8<sup>th</sup> of December 2021 and accepted for publication on the 11<sup>th</sup> of March 2022

**Results:** Of all included students, 39.2% reported they had six to seven hours of sleep each day. Study-related reasons were indicated by 32.6% of students, followed by those who utilized social media (21.7%). Laziness, exhaustion, annoyance, and restlessness were the top reasons for sleeping less (27.5%). Prior academic success was significantly connected to sleep length, while current sleep duration was not.

**Keywords:** sleep, students, habits, disorder, questionnaire.

## INTRODUCTION

**H**umans require sleep as part of their everyday routine. It not only serves to refresh the brain, but it also helps to boost the normal functioning of the body. Sleep aids in the removal of toxic metabolites at the cellular levels (1-2). Those who do not get enough sleep are more likely to have behavioural issues (3-5). In the literature, sleep deprivation has been demonstrated to cause and exacerbate a variety of psychological issues in people of all ages (6). Medical students who deal with patients who have been ill on a daily basis and perform skilled activities find that sleep is a more significant aspect for them.

Sleep disorders that arise among undergraduate students are likely to remain and worsen over time (7). This is likely to be exacerbated by the stress that students face on a daily basis. Sleep is likely to be disrupted among all university students as a result of exam stress, and medical undergraduates are no exception. The duration and quality of sleep are both essential factors. According to studies, medical students are more likely to be stressed during their first years for a variety of reasons (8). Thus, the present study was designed with the primary goal of determining the sleeping patterns of undergraduate medical students as well as the many causes of sleep problems; its secondary goal was to determine the impact of sleep-related problems on students' academic performance. □

## MATERIAL AND METHOD

**T**his is a research project that took place in a medical school in Central India and was carried out among first-year medical students.

### Study type

A cross-sectional study was conducted in the medical school.

### Sample size calculation

Because all students in their first year of medical school were included in the study, no sample size was calculated.

### Study participants

The present study comprised all first-year students attending the medical school.

### Inclusion criteria

No inclusion criteria were used.

### Exclusion criteria

Students suffering from a sleep disorder and those who were using sleep-affecting medications.

### Methodology

All first-year medical students attending the medical school were approached about participating in the present study and were enrolled after giving their consent. Students received a semi-structured self-administered questionnaire and were instructed to complete it. Data was collected using Google Forms on the internet.

### Analysis

Microsoft Excel 2019 was used to enter and analyse data. To maintain anonymity, all student-level identifiers were removed. Prevalence was reported as percentage with a 95% confidence interval. The mean and standard deviation (SD) of continuous variables was reported.

### Ethical consideration

Ethical approval was taken from the institutional Human Ethics Committee of Index Medical College and Hospital. Participants signed an informed consent form. All participant-level identifiers were removed prior to analysis. Participants who complained about sleep problems received appropriate counselling and were referred to a psychiatric outpatient clinic for further evaluation. □

**TABLE 1.** Demographic and sleep characteristics of students included in the study (N=171)

Characteristics		% (N)
1. Gender	Male	47.4% (81)
	Female	52.6% (90)
Living with Family		11.1% (19)
Sleep Disorder		1.8% (3)
Day time Sleep	Yes	42.7 % (73)
	Occasionally	10.5 % (18)
	Never	46.8 % (80)
Duration of Day time Sleep	<1 hr	48.0 % (44)
	1-2 hrs.	41.0 % (37)
	>2 hrs	11.0 % (10)
Sleep Duration during 12 <sup>th</sup>	< 6 hrs	14.0 % (24)
	6-7 hrs.	39.2 % (67)
	7-8 hrs.	34.5 % (59)
	>8hrs.	12.3 % (21)
Sleep duration during recent examination	< 6 hrs	79.5 % (136)
	6-7 hrs.	8.8 % (15)
	7-8 hrs.	11.7% (20)
	>8hrs.	0.0% (0)

**RESULTS**

There were 171 students in the present study, of which 47.4% were males and the remaining 52.6% females. Only 11.1% of students

were living with their families, despite being all day students. When asked about their sleeping patterns, 39.2% of students stated they used to sleep for six to seven hours per day, while one third of participants reported they slept for seven to eight hours per day. Only 12.3% of students had more than eight hours of sleep. Of all students, 53.2% slept during the day, of which only 11% had more than two hours of sleep (Table 1).

When asked why they were sleeping for less time, 32.6% of students mentioned study-related reasons and 21.7% social media usage. Around 30% of students cited no specific reason. The most common reasons for shorter sleep duration included laziness, exhaustion, annoyance, and restlessness (27.5%), followed by headache (17.5%), drowsiness (14.6%), and loss of attention (12.3%). However, only about 27.5% of students stated that sleep deprivation was not a concern for them.

When inquired about their previous academic performance, the majority of students scored between 81–90%, with 34.5% scoring between 71 and 80%. The majority of participants (53.2%) scored between 61 and 70% on the most recent exam, and 33.3% between 71 and 80% (Table 2).

We found that prior academic performance was significantly associated with sleep duration. However current sleep duration was not significantly connected with academic performance

Examination	Score	% (N)
12 <sup>th</sup> Board Examination	<=60%	2.9% (5)
	61- 70%	12.3% (21)
	71- 80%	34.5% (59)
	81- 90%	43.3% (74)
	>90%	7.0 % (12)
Last Examination	< =60%	12.3 (21)
	61- 70%	53.2 % (91)
	71- 80%	33.3 % (57)
	81- 90%	1.2 % (2)
	>90%	0.0% (0)

**TABLE 2.** Students’ academic performance

	Sleep hours vs academic performance	(mean ±SD)	95 % CI		P value
			LB	UB	
12 <sup>th</sup>	<6 hours	81.43±8.43	79.4	83.4	0.037*
	6-7 hours	81.03±7.01	78.2	83.9	
	7-8 hours	76.90±8.16	74.3	79.5	
	>8 hours	78.91±8.95	75.8	82.0	
Current	<6 hours	69.31±5.83	66.8	71.8	0.618
	6-7 hours	68.35±6.04	66.9	69.8	
	7-8 hours	67.31±7.45	65.4	69.3	
	>8 hours	68.33±6.33	65.5	71.2	

**TABLE 3.** Relation between sleep hours and academic performance

when the latter was compared to the number of sleeping hours (Table 3). □

### DISCUSSION

The present study found that none of the students slept for more than eight hours every day, with the majority sleeping for six to seven hours during the examination, indicating that students attending medical school had an insufficient sleep duration. According to a study conducted by Maheswari *et al*, in Pakistan, on 980 students, the majority of subjects used to sleep 6-7 hours per day (9), which was comparable to our findings. Students with the best performance had considerably earlier bedtimes ( $p=0.05$ ) and wake times ( $p=0.008$ ), according to the study of Arne H. Eliasson *et al* (10). A study conducted by Lawson *et al*, in Ghana, among medical and dental students discovered that the average sleep duration was  $5.7 \pm 1.2$  hours (11), which was less than that reported by our research. According to a study conducted by Fatima *et al* among medical and dentistry students in Islamabad, barely 25% of them used to sleep for eight hours on week days. According to Jane F. Gaultney's research, 27% of students were at risk of at least one sleep issue (12). Another study found that sleep duration was longer than that reported by our research (13). According to a study conducted by R. Javaid *et al*, the majority

of medical and allied health students attending a medical school in Pakistan slept for 7-10 hours per day, which was greater than the findings of our study. Approximately 56% of students nap during the day, which is also higher than our findings (14). With the exception of Maheswari *et al*, this is greater than our research and previous Pakistani studies. Geographical disparities, cultural variations, and study population differences might all have a role.

Sleep quality in the past was shown to be connected with sleep length in the present study. However, sleep duration was not found to be statistically associated with current academic performance. Academic performance was not linked to sleep length or quality, according to a study conducted in Babylon by A.K. Al-Humairi *et al* among medical students (15). The lack of relationship between sleep length and academic performance in both studies might be explained by the fact that medical school topics are more or less applied science, with little function for short-term memory that is likely to be influenced by sleep. Bahammam *et al* of King Saud University's College of Medicine conducted a study that supported this claim (16). They also found no link between sleep duration and academic achievement. However, in Ana Allen Gomes' research, sleep phase, morning/evening preference, sleep deprivation, sleep quality, and sleep irregularity were all found to be substantially linked with at least two aca-

ademic performance metrics in univariate models (17). Another factor that might play a role is the small sample size. Because the design of the present study did not establish a sample size, maybe it was lower than what was required to find a meaningful association between variables. However, using a retroactive estimate of power, Zeek *et al* found that sleep duration the night prior to an examination was directly connected to academic achievement, but total sleep duration at night during a typical school week was not (18). However, the above-mentioned study was done on a different demographic, namely pharmacy students. In a survey of undergraduate medical students, Rasekhi *et al* reported that 62% of participants slept for 4-6 hours each day. Although there was no assessed correlation between sleep duration and academic achievement, there were significant academic disparities between those who slept well and those who slept badly (19). Another study, conducted by Abdulghani *et al*, discovered that sleeping for 6-10 hours was related with higher academic scores (20). A study performed by Raley *et al* among university students in the United States found that the mean sleep duration was greater among those with higher GPA levels, which was shown to be statistically significant (21). Seblewengel Lemma *et al* discovered that students with higher sleep quality

scores were better performing academically (P value=0.001), whereas sleep duration was not associated with academic performance in the final model (22).

The differences between findings of our research and those of all prior studies might be ascribed to differences in geographic location and population. Inconsistencies might be attributable to the small sample size of the present study, which was not primarily designed to find a relationship between sleep duration and academic achievement. □

## CONCLUSION

The length of sleep among medical students shows that they are getting insufficient sleep. Sleep duration has also been shown to have no impact on academic achievement. As a result, there is a pressing need for medical students to be counselled on the subject of sleep duration. Inadequate sleep quantity and quality among current medical students may jeopardise their health requirements not only in the present but also on the long term, when they will become physicians. This will also make dealing with clinical difficulties easier for them. □

*Conflicts of interest: none declared.*

*Financial support: none declared.*

## REFERENCES

- Xie L, Kang H, Xu Q, et al. Sleep drives metabolite clearance from the adult brain. *Science* 2013;342:373-377.
- Davies SK, Ang JE, Revell VL. Effect of sleep deprivation on the human metabolome. *Proc Natl Acad Sci USA* 2014;111:10761-10766.
- Reid GJ, Hong RY, Wade TJ. The relation between common sleep problems and emotional and behavioural problems among 2- and 3-year-olds in the context of known risk factors for psychopathology. *J Sleep Res* 2009;18:49-59.
- Lavigne JV, Arend R, Rosenbaum D, et al. Sleep and behavior problems among preschoolers. *J Dev Behav Pediatr* 1999;20:164-169.
- Sadeh A, Gruber R, Raviv A. Sleep, neurobehavioral functioning, and behavior problems in school-age children. *Child Dev* 2002;73:405-417.
- Stein MB, Belik SL, Jacobi, et al. Impairment associated with sleep problems in the community: relationship to physical and mental health comorbidity. *Psychosom Med* 2008;70:913-919.
- Ford DE, Kamerow DB. Epidemiologic study of sleep disturbances and psychiatric disorders. An opportunity for prevention? *JAMA* 1989;262:1479-1484.
- Shakthivel N, Amarnath VM, Ahamed F, et al. Level of Perceived Stress and Coping Strategies Prevailing Among 1st Year Medical undergraduate Students: A cross-sectional study from south India. *Int J Med. Public Health* 2017;7:110-114.
- Maheshwari G, Shaikat F. Impact of Poor Sleep Quality on the Academic Performance of Medical Students. *Cureus* 2019;11:e4357.
- Eliasson AH, Lettieri CJ, Eliasson AH. Early to bed, early to rise! Sleep habits and academic performance in college students. *Sleep Breath* 2010;14:71-75.
- Lawson HJ, Wellens-Mensah JT, Attah Nantogma S. Evaluation of Sleep Patterns and Self-Reported Academic Performance among Medical Students at the University of Ghana School of Medicine and Dentistry. *Sleep Disord* 2019;2019:1278579.
- Gaultney JF. The prevalence of sleep disorders in college students: impact on academic performance. *J Am Coll Health* 2010;59:91-97.
- Fatima K, Rizvi F, Ali M, et al. Sleep Pattern and Sleep Duration of Medical College Students. *Ann. Pak. Inst. Med. Sci* 2011;7:79-81.
- Javaid R, Momina AU, Sarwar MZ, et al. Quality of Sleep and Academic Performance among Medical University Students.

- J Coll Physicians Surg Pak* 2020;30:844-848.
15. **Al-Hmairi AK.** Sleep quality and academic performance among medical college students.  
*J Babylon University/ Pure and Applied Sciences* 2018;26 (3).
16. **Bahammam AS, Alaseem AM, Alzakri AA, et al.** The relationship between sleep and wake habits and academic performance in medical students: a cross-sectional study.  
*BMC Med Educ* 2012;1;12:61.
17. **Gomes AA, Tavares J, de Azevedo MH.** Sleep and academic performance in undergraduates: a multi-measure, multi-predictor approach.  
*Chronobiol Int* 2011;28:786-801.
18. **Zeek ML, Savoie MJ, Song M, et al.** Sleep Duration and Academic Performance Among Student Pharmacists.  
*Am J Pharm Educ* 2015;79:63.
19. **Rasekhi S, Ashouri FP, Pirouzan A.** Effect of sleep quality on academic performance of undergraduate medical students,  
*Health Scope* 2016;5:e31641.
20. **Abdulghani HM, Alrowais NA, Bin-Saad NS, et al.** Sleep disorder among medical students: relationship to their academic performance.  
*Med Teach* 2012;34:S37-S41.
21. **Raley HR, Naber JL, Cross S, et al.** The Impact of Duration of Sleep on Academic Performance in University Students.  
*Madridge J Nurs* 2016;1:11-18.
22. **Lemma S, Berhane Y, Worku A, et al.** Good quality sleep is associated with better academic performance among university students in Ethiopia.  
*Sleep Breath* 2014;18:257-263.

