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Original Research Article

Unravelling the sleep crisis: insomnia among medical students in government and private medical college students in Mysuru district

Rakesh M.[1], Sunil Kumar D.[1], Mudassir Khan[1], Anchu R. Nath[1]*, Sana Khader M.[1], Anila P.[2]

[1]Department of Community Medicine, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India
[2]Department of Community Medicine, Mysore Medical College and Research Institute, Mysuru, Karnataka, India

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***Correspondence:**
Dr. Anchu R. Nath,
E-mail: anchurnath24@gmail.com

ABSTRACT

Background: Insomnia, a prevalent sleep disorder, significantly impacts medical students due to the high levels of stress and demanding academic schedules. The educational environment of medical students, marked by intense competition and high expectations, often contributes to chronic stress, a known precursor to sleep disturbances. This study aimed to compare the prevalence of insomnia among medical students in government and private medical colleges and assess the factors contributing to insomnia in these groups.
Methods: The cross-sectional study was conducted among 490 medical students from government and private medical colleges over three months (April to June 2024). Systematic sampling was used to select participants, and data were collected via a self-administered questionnaire, including sociodemographic information and the Athens insomnia scale. Data were analysed using SPSS Version 26.0, with chi-square tests for qualitative data and Mann-Whitney U tests for insomnia comparisons.
Results: The study revealed a significantly higher prevalence of insomnia in private medical college students (40.8%) compared to government college students (11.8%). Significant associations were found between insomnia and insufficient sleep, stress, and depression in both groups. Additionally, the use of mobile devices at night and irregular sleep patterns during exams were linked to higher insomnia rates. The median insomnia score was higher in private medical college students compared to government college students, indicating a statistically significant difference (p value <0.05).
Conclusions: Targeted interventions to improve sleep quality and mental health support are crucial for this population. Regular assessments and feedback mechanisms should be implemented to enhance the effectiveness of these interventions.

Keywords: Insomnia, Interventions, Prevalence, Sleep

INTRODUCTION

Insomnia is a common sleep disorder characterized by persistent difficulties in falling asleep, staying asleep, or waking up too early, leading to daytime impairment or distress.[1] This condition is particularly prevalent among medical students, a demographic known for experiencing high levels of stress due to rigorous academic demands, long study hours, and the emotional toll of clinical training.[2] The prevalence of insomnia among medical students has garnered increasing attention from researchers, as it poses significant implications for both their mental health and academic performance.[2,3]

The medical education environment is inherently challenging, often marked by intense competition, high expectations, and a demanding curriculum.[4] These factors contribute to chronic stress, which is a well-documented precursor to sleep disturbances. Various studies have indicated a significant prevalence of sleep disorders

among medical students, often ranging from 30% to 60%.[3,5]

The consequences of insomnia extend beyond mere fatigue; they can significantly impair cognitive function, emotional regulation, and overall quality of life.[5] Research has shown that inadequate sleep can lead to decreased academic performance, increased absenteeism, and a higher risk of burnout.[6] Furthermore, chronic sleep deprivation is associated with a range of mental health issues, including anxiety and depression, which are already prevalent among medical students.

Despite the growing body of literature on insomnia among medical students, there remains a gap in understanding how these sleep disturbances may differ between students attending government and private medical colleges. The educational environments, resources, and support systems available at these institutions can vary significantly, potentially influencing students' stress levels and sleep quality. For instance, students in private medical colleges may face different financial pressures and academic expectations compared to their counterparts in government institutions.[7] This comparative analysis aimed to shed light on these differences, providing insights that could inform tailored interventions to improve sleep hygiene and overall well-being.

METHODS

The cross-sectional study was conducted among 490 medical students at a government and private medical college over three months from April 1st to June 31st, 2024, after obtaining ethical clearance and permission from the head of the institution.

Sample size calculation

The sample size was calculated based on 30.3% and 39.4% prevalence of insomnia in government and private among medical students respectively, as reported by a study conducted by Telgote et al and Roslin Jose et al.[8,9] The sample calculation was done with a 95% confidence interval using the formula:

$$N = \frac{(Z_{1-\frac{\alpha}{2}}+Z_{1-\beta})^2(P_1Q_1+P_2Q_2)}{(p_1-p_2)^2}$$

resulting in a required sample size of 245 students per group.

Sampling method

Participants were selected using a systematic sampling technique from MBBS phase 1, phase 2, phase 3 (part 1), and phase 3 (part 2) students. Out of the total of 700 medical students and 600 medical students from private and government medical colleges respectively, the student list provided by the college office was rearranged alphabetically to create the sampling frame. The desired sample size divided by the total number of students yielded a sampling interval of 2. Every alternate student was included in the study according to this frame. If a chosen student declined to participate, the next person on the list was considered.

Inclusion criteria

The study included undergraduate medical students who were willing to participate and were above 18 years of age.

Exclusion criteria

Students with medical conditions such as kyphosis or scoliosis that could interfere with anthropometric measurements were excluded.

Data collection

Data was collected using a self-administered questionnaire comprising three parts: the first part contained sociodemographic information, the second part included the validated Athens insomnia scale questionnaire, and the final part consisted of factors associated with insomnia. The eight-item Athens insomnia scale evaluates sleep onset, night and early morning waking, sleep time, sleep quality, frequency and duration of complaints, distress caused by insomnia, and interference with daily functioning. A cut-off score of ≥6 on the Athens insomnia scale was used to diagnose insomnia. A calibrated digital weighing machine measured weight to the nearest 0.1 kg, and a Seca stadiometer measured height to the nearest 0.1 cm. Body mass index (BMI) was then calculated and categorized based on the Asia-Pacific BMI classification: underweight (<18.5), normal (18.5-22.9), overweight (23-24.9), and obese (>25).[9] The data was analysed using SPSS version 26.0 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp). Percentages were calculated for descriptive variables. The chi-square test was used to analyse qualitative data, with associations considered statistically significant at p values <0.05 and a 95% confidence interval. The Shapiro-Wilk test was done to assess the normality of insomnia scores. Mann Whitney U test was done to compare insomnia between government and private medical colleges.

RESULTS

Around 490 medical students participated in the study. The socio-demographic profile of the study revealed that the majority of students were between 18-20 years old 325 (66.3%), with a higher proportion in private medical college 171 (69.8%) compared to government medical college 154 (62.9%).

Table 1: Sociodemographic profile of study participants.

Socio-demographic profile		Government (%)	Private (%)	Total (%)
Age (years)	18-20	154 (62.9)	171 (69.8)	325 (66.3)
	21-23	89 (36.3)	65(26.5)	154 (31.4)
	>23	2 (0.8)	9 (3.7%)	11 (2.2)
Gender	Male	140 (57.1)	93 (38)	233 (47.6)
	Female	105 (42.9)	152 (62)	257 (52.4)
Year of Study	First year	81 (33.1)	82 (33.5)	163 (33.3)
	Second year	78 (31.8)	80 (32.6)	158 (34.5)
	Third year	86 (35.1)	83 (33.9)	169 (68.9)
Diet	Vegetarian	83 (33.9)	39 (15.9)	122 (24.9)
	Mixed	162 (66.1)	206 (84.1)	36 (75.1)
Mode of stay	Hostel	193 (78.8)	88 (35.9)	281 (57.3)
	Day-scholar	52 (21.2)	157 (64.1)	209 (42.7)

Table 2: Association between various factors and Athens insomnia scale among study participants of private medical college.

Factors		Athens Insomnia Scale		P value
		Present (%)	Absent (%)	
Do you feel you are getting enough sleep	Yes	30 (30.0)	72 (49.7)	0.000
	No	53 (53.0)	34 (23.4)	
	Occasionally	17(17)	39 (26.9)	
Do you smoke	Yes	4 (4.0)	6 (4.1)	0.706
	No	96 (96)	138 (95.2)	
	Occasionally	0 (0.0)	1 (0.7)	
Do you use alcohol	Yes	13 (13.0)	19 (13.1)	0.924
	No	78 (78.0)	115 (79.3)	
	Occasionally	9 (9)	11 (7.6)	
Do you regularly drink coffee	Yes	32 (32.0)	38 (26.2)	0.07
	No	50 (50.0)	92 (63.4)	
	Occasionally	18 (18.0)	15 (10.3)	
Do you exercise regularly	Yes	39 (39)	48 (33.1)	0.608
	No	38 (38)	58 (40.0)	
	Occasionally	23 (23)	39 (26.9)	
Do you feel stress	Yes	67 (67)	41 (23.8)	0.000
	No	13 (13)	64 (44.1)	
	Occasionally	20 (20)	40 (27.6)	
Do you feel depressed	Yes	40 (40)	23 (15.9)	0.00
	No	32 (32)	96 (66.2)	
	Occasionally	28 (28)	26 (17.9)	
Do you use a mobile/laptop at night	Yes	89 (89)	111 (76.6)	0.047
	No	4 (4)	12 (8.3)	
	Occasionally	7 (7)	22 (15.2)	
Do you feel sleepy during the daytime	Yes	68 (68)	85 (58.6)	0.061
	No	7 (7)	25 (17.2)	
	Occasionally	25 (25)	35 (24.1)	
Do you sleep regularly during exam time	Yes	42 (42)	44 (30.3)	0.032
	No	56 (56)	101 (69.7)	
	Sometimes	2 (2)	0 (0)	
Do you take medications to get sleep	Yes	2 (2)	4 (2.8)	0.706
	No	98 (98)	141 (97.2)	
Do you practice Yoga or meditation to improve your sleep quality?	Yes	12 (12)	22 (15.2)	0.016
	No	79 (79)	121 (83.4)	
	Occasionally	9 (9)	2 (1.4)	
Have you taken anything to help you sleep at night	Yes	4 (4)	11 (7.6)	0.250
	No	96 (96)	134 (92.4)	

Table 3: Association between various factors and Athens insomnia scale among study participants of government medical college.

Factors		Athens insomnia scale		P value
		Present	Absent	
Do you feel your are getting enough sleep	Yes	7 (24.1)	67 (31)	0.00
	No	22 (75.9)	149 (69)	
	Occasionally	0 (0)	0 (0)	
Do you smoke	Yes	29 (100)	213 (98.6)	0.523
	No	0 (0)	3 (1.4)	
	Occasionally	0 (0)	0 (0)	
Do you use alcohol	Yes	0 (0)	1 (0.5)	0.195
	No	24 (82.8)	199 (92.1)	
	Occasionally	5 (17.2)	16 (5)	
Do you regularly drink coffee	Yes	7 (24.1)	68 (31.5)	0.587
	No	12 (41.4)	91 (42.1)	
	Occasionally	10 (34.5)	57 (26.4)	
Do you exercise regularly	Yes	9 (31)	72 (33.2)	0.941
	No	9 (31)	69 (31.9)	
	Occasionally	11 (37.9)	75 (34.7)	
Do you feel stress	Yes	18 (62.1)	27 (12.5)	0.000
	No	2 (6.9)	107 (49.5)	
	Occasionally	9 (31)	82 (38)	
Do you feel depressed	Yes	15 (51.7)	11 (5.1)	0.000
	No	5 (17.2)	150 (69.4)	
	Occasionally	9 (31)	55 (25.5)	
Do you use a mobile/laptop at night	Yes	27 (93.1)	152 (70.4)	0.030
	No	0 (0)	22 (10.2)	
	Occasionally	2 (6.9)	42 (19.4)	
Do you feel sleepy during the daytime	Yes	20 (69)	50 (23.1)	0.000
	No	2 (6.9)	73 (33.8)	
	Occasionally	7 (24.1)	93 (43.1)	
Do you sleep regularly during exam time	Yes	8 (27.6)	112 (51.9)	0.048
	No	15 (51.7)	72 (33.3)	
	Occasionally	6 (20.7)	32 (14.8)	
Do you take medications to get sleep	Yes	1 (3.4)	1 (0.5)	0.189
	No	28 (96.6)	211 (97.7)	
	Occasionally	0 (0)	4 (1.9)	
Do you practice Yoga or meditation to improve your sleep quality?	Yes	1 (3.4)	9 (4.2)	0.903
	No	24 (82.8)	183 (84.7)	
	Occasionally	4 (13.8)	24 (11.1)	
Have you taken anything to help you sleep at night	Yes	7 (24.1)	67 (31)	0.449
	No	22 (75.9)	149 (69)	

Male students constituted 47.6% of the sample, with a higher percentage in government medical college 140 (57.1%), while female students were more prevalent in private medical college 152 (62%). Students were fairly evenly distributed across the years of study, with the second year having a slight majority of 158 (34.5%). Dietary habits showed that most students had a mixed diet 368 (75.1%), particularly in private medical college 206 (84.1%). Regarding accommodation, a significant portion of students resided in hostels 281 (57.3%), predominantly from government medical college 193 (78.8%), whereas a larger proportion of private medical college students were day scholars 157 (64.1%) (Table 1).

The prevalence of insomnia among study participants of government and private medical college was found to be 11.8% and 40.8% respectively (Figure 1).

In the current study, among private medical college students, the Athens insomnia scale results indicated several significant associations. Individuals who reported not getting enough sleep were more likely to have

insomnia (p=0.000). Stress and depression were strongly associated with insomnia, with those feeling stressed (p=0.000) or depressed (p=0.000) showing higher insomnia rates. Using mobile/laptops at night (p=0.047) and irregular sleep patterns during exams (p=0.032) were also linked to higher insomnia rates. While smoking, alcohol use, coffee consumption, regular exercise, daytime sleepiness, medication use for sleep, and taking something to help sleep showed no significant associations with insomnia, practicing yoga or meditation occasionally showed a significant association (p=0.016). Overall, sleep hygiene, stress, and depression play crucial roles in insomnia according to the Athens insomnia scale (Table 2).

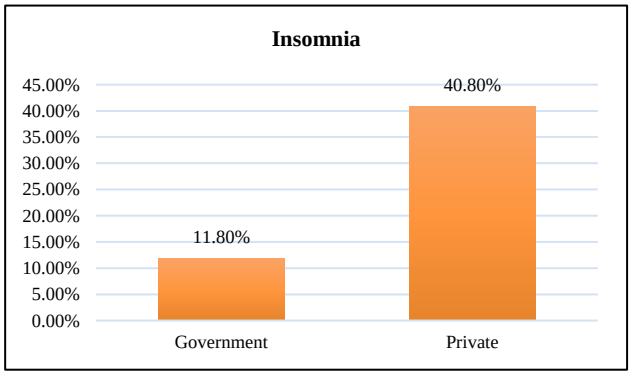

Figure 1: Prevalence of insomnia among study participants of government and private medical college.

Among the government medical college students, those who do not feel they get enough sleep were more likely to have insomnia (p=0.000). Stress and depression were strongly linked to insomnia, with those experiencing stress (p=0.000) or depression (p=0.000) showing higher rates of insomnia. Using a mobile/laptop at night (p=0.030) and irregular sleep patterns during exams (p=0.048) were also associated with increased insomnia. Smoking, alcohol use, regular coffee consumption, regular exercise, and taking medications to sleep do not show significant associations with insomnia. Feeling sleepy during the daytime (p=0.000) and using a mobile/laptop at night were significant factors (Table 3).

Table 4: Comparison of insomnia among study participants of government and private medical college.

Institution	Athens insomnia scale		P value
	Median	IQR	
Government	2	1-3	0.00
Private	4	3-7	

The median insomnia score for individuals in government medical college was 2 (IQR 1-3), while it was notably higher at 4 (IQR 3-7) for those in private medical college, which was statistically significant (p value- 0.00) (Table 4).

DISCUSSION

The findings of this study provide valuable insights into the socio-demographic profile of medical students in Mysuru, highlighting significant differences between those attending government and private medical colleges. With a sample size of approximately 490 students, the results reveal critical patterns in age distribution, gender, dietary habits, and living arrangements, which may have implications for their overall well-being and academic performance.

The majority of participants were aged 18-20 years (66.3%), which is consistent with the typical age range for medical students in India. This age group is often associated with increased academic pressure and lifestyle adjustments, which can contribute to sleep disturbances, including insomnia.[10] Notably, a higher proportion of students from private medical colleges (69.8%) fell within this age bracket compared to their government counterparts (62.9%). This discrepancy may reflect the admission patterns and demographic characteristics of private institutions, which often attract younger students.

In terms of gender distribution, male students constituted 47.6% of the sample, with a higher representation in government medical colleges (57.1%). Conversely, female students were more prevalent in private medical colleges (62%). This gender disparity is significant as previous studies have indicated that female students may experience higher levels of stress and anxiety, potentially leading to increased rates of insomnia.[12] Understanding these gender differences is crucial for developing targeted interventions to support students' mental health and well-being.

The most striking finding is the strong association between insufficient sleep and insomnia (p=0.000). This aligns with existing literature that emphasizes the importance of adequate sleep for maintaining overall health and cognitive function, particularly in high-stress environments like medical education.[14] Insufficient sleep can exacerbate feelings of stress and anxiety, creating a vicious cycle that further impairs sleep quality.[14] Therefore, interventions aimed at promoting better sleep hygiene practices among students are essential.[13] Stress and depression were also found to be significantly associated with insomnia (p=0.000). This supports the notion that mental health issues are prevalent among medical students and can significantly impact their sleep quality.[12,13] The high levels of stress experienced by medical students, often due to academic pressures and workload, can lead to increased insomnia rates.

The study identified that using mobile devices or laptops at night (p=0.047) and irregular sleep patterns during exams (p=0.032) were linked to higher rates of insomnia. This finding is consistent with research indicating that screen time before bed can negatively affect sleep quality due to blue light exposure, which disrupts the circadian

rhythm.[14] Encouraging students to limit screen time in the evening and establish regular sleep schedules could be beneficial strategies to enhance sleep quality.

Interestingly, other lifestyle factors such as smoking, alcohol use, regular coffee consumption, and exercise did not show significant associations with insomnia in this study. This contrasts with previous research that has linked these behaviours to sleep disturbances.[12,14] However, the absence of significant associations may suggest that the impact of these factors could vary based on individual differences or the specific context of medical students' lifestyles.

CONCLUSION

The current study concludes that the prevalence of insomnia among study participants of government and private medical college was found to be 11.8% and 40.8% respectively. Regarding the factors associated with insomnia, both private and government medical college students show strong links between insufficient sleep, stress, depression, and insomnia. The use of mobile devices or laptops at night and irregular sleep patterns during exams are also significantly associated with higher insomnia rates in both groups. Conduct periodic assessments of students' sleep quality and mental health to evaluate the effectiveness of implemented interventions and make necessary adjustments. Establish channels for students to provide feedback on the support services and programs offered, ensuring that their needs are being met effectively.

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