

Original Research Article

Sleep quality and sleep hygiene practices among the undergraduate and post graduate medical students in a medical college and tertiary hospital, Navi Mumbai: a cross-sectional study

Surekha Aishwarya R.*, Violet Pinto, Sumedha Joshi, Anupriya Mohokar, Taneya Singh

Department of Community Medicine, Dr DY Patil University, School of Medicine, Nerul, Navi Mumbai, Maharashtra, India

Received: 12 June 2026

Accepted: 22 July 2026

*Correspondence:

Dr. Surekha Aishwarya R.,

E-mail: surekhaaishwarya1997@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Sleep is vital for physical and mental health, yet medical students are prone to poor sleep due to academic stress and irregular schedules. Poor sleep quality and hygiene negatively impact learning, mood, and well-being.

Methods: A cross-sectional study was conducted among 382 medical students at a tertiary medical college in Navi Mumbai, India. Data were collected using a self-administered Google form containing the Pittsburgh sleep quality index (PSQI), sleep hygiene index (SHI), and questions on sociodemographic and lifestyle factors. Statistical analysis was performed using Jamovi version 2.6, applying the Chi-square test and binomial logistic regression to determine associations and predictors.

Results: Poor sleep quality was reported by 56.5% of participants, while 53.9% exhibited poor sleep hygiene. Satisfaction with academic performance, family history of sleep disorders, headaches, self-medication, comorbidities, strained relationships, physical activity and number of rooms at the place of stay were significantly associated with poor sleep quality ($p < 0.05$). Factors significantly associated with poor sleep hygiene were accommodation, academic satisfaction, family history of sleep disorders, headaches, self-medication, strained relationships, and weekend screen time ($p < 0.05$). Logistic regression showed students with poor sleep hygiene were nearly twice as likely to have poor sleep quality (OR 1.5-2.5, $p < 0.05$).

Conclusions: Poor sleep quality and hygiene are highly prevalent among medical students. Interventions targeting stress management, time regulation, and healthy sleep habits are essential.

Keywords: Sleep quality, Sleep hygiene, Sleep health, Medical students

INTRODUCTION

Sleep is a fundamental biological necessity for maintaining optimal physical health, cognitive function, and psychological well-being.¹ It is during sleep that the brain processes information, recovers, and supports critical functions like memory consolidation, concentration, and decision-making.² The importance of good sleep quality is universally acknowledged, yet poor sleep quality (PSQ) and insufficient sleep are widespread

concerns both nationally and globally.³ Within the academic landscape, university students are recognized as a particularly vulnerable population prone to sleep disturbances.⁴ This vulnerability is significantly amplified for medical students- both undergraduates and postgraduates (residents)- who face unique and intense stressors.^{5,6} The demanding academic curriculum of medical students, coupled with the emotional challenges of clinical exposure, long on-call duties, and the constant pressure to achieve and assimilate a vast amount of complex information, places them at a high risk for

compromised sleep health.^{7,8} Studies across various regions in India and abroad consistently highlight the high prevalence of poor sleep quality among medical students. Poor sleep quality is often linked to detrimental outcomes such as deficits in attention, impaired cognitive function, increased daytime sleepiness, heightened risk of anxiety and depression, and ultimately, poorer academic performance.^{9,10} Sleep hygiene refers to the set of behavioral and environmental practices designed to promote healthy sleep.¹¹ These modifiable practices, which include maintaining a consistent sleep schedule, avoiding stimulants (like caffeine, tea, or tobacco) close to bedtime, and limiting technology or work-related activities in bed, are crucial for improving sleep quality.^{12,13} Research suggests that maladaptive sleep hygiene practices, such as consuming heavy meals before bed or excessive nighttime screen use, are significant predictors of poor sleep quality and daytime sleepiness in this population.^{5,9,14}

Given that medical students are future healthcare providers, understanding and addressing sleep-related issues in this group is of paramount importance. This study aims to assess the sleep quality- its determinants and sleep hygiene practices among undergraduate and postgraduate medical students, in a tertiary care hospital thereby contributing to the development of targeted interventions to improve their overall well-being and professional competency.

The current study was conducted with the objectives to assess sleep quality and sleep hygiene practices among undergraduate and postgraduate medical students and identify the determinants affecting sleep health.

METHODS

Study design and setting

A cross-sectional observational study was conducted at a medical college and tertiary hospital located in Nerul, Navi Mumbai. The study was carried out over a period of five months, from March to July 2025.

Study population

Undergraduates including interns and postgraduate medical students at the institution were enrolled.

Sample size calculation

Based on previous literature reporting a prevalence of poor sleep quality ranging from 34.6% to 53%, sample size was calculated using the formula - $(n = \frac{z^2 pq}{d^2})$, where: p= prevalence of poor sleep quality as 53%, $q = 100 - p = 47$, $Z = 1.96$ at 95% confidence interval, $d = 5$ (absolute precision).⁸

Since, this was a cross-sectional study, no attrition rate was included, the sample size was calculated to be 382.

Convenience sampling was used to obtain the sample size.

Inclusion criteria

Undergraduates, interns and postgraduate medical students who provided informed consent were included in the study.

Exclusion criteria

Students with a diagnosed psychiatric illness. Students on medications affecting sleep (e.g., sedatives, mood stabilizers). Students who did not give consent.

Data collection tools

After obtaining permission from the Institutional ethical committee, data was collected using a semi structured self-administered Google form comprising of sociodemographic and lifestyle questionnaire, Pittsburgh sleep quality index (PSQI)- to assess sleep quality and sleep hygiene index (SHI)- to evaluate sleep hygiene practices.^{12,15}

The Pittsburgh sleep quality index (PSQI) is a validated (satisfactory internal consistency with Cronbach alpha of 0.77) and widely used self-rated questionnaire appropriate for individuals aged 18 years or older.¹⁵ It assesses sleep quality over a 1-month interval and comprises 19 self-rated questions, grouped into seven components. Each component is scored on a 0 to 3 scale, and the total global PSQI score ranges from 0 to 21. A global score ≥ 5 indicates poor sleep quality.

The sleep hygiene index (SHI) is a self-reported measure used to assess sleep hygiene behaviours that might interfere with sleep.¹² It is a validated scale with a satisfactory internal consistency of Cronbach alpha 0.68. Each item is rated on a 5-point Likert scale. The scores for all 13 items are added to obtain a total SHI score- 0 to 52. A mean SHI score of 22.1 was taken as the cut off value. Scores above the mean value were categorized as poor sleep hygiene and below 22.1 was taken as good sleep hygiene.

Data analysis

Data entry was performed using Microsoft Excel, and statistical analysis was carried out using Jamovi version 2.6. Descriptive statistics such as mean, proportions and percentages were used for baseline characteristics. Pearson's Chi-square test was applied for categorical variables to check for associations. Statistical significance was set at $p < 0.05$. Binomial logistic regression was applied to test the association between study variables- component scores of sleep quality and outcome variable - sleep hygiene practices. A p value of < 0.05 was considered statistically significant. Adjusted odds ratios

with 95% confidence intervals were used to represent the strength of association.

RESULTS

The total number of responses received from the medical students both undergraduates and post graduates across all academic years were 382. The mean age of participants was 21.64 ± 3 years. The sample comprised 66.2% of female students ($n=253$) and 33.8% male students ($n=129$). Among the responses received majority were from MBBS first-year (27.2%, $n=104$), and from MBBS 3rd year (21.9%, $n=84$).

Table 1 shows the association between sociodemographic variables and sleep quality. Of the 382 medical students and residents surveyed, 166 (43.5%) reported good sleep quality while 216 (56.5%) reported poor sleep quality. In the bivariate analysis using Pearson's chi squared test, it was found that sociodemographic and lifestyle variables like self-satisfaction with academic work ($\chi^2=16.3$, $p<0.01$), family history of diagnosed sleep disorders ($\chi^2=12.2$, $p<0.001$), occurrence of headache and use of self-medication ($\chi^2=12.7$, $p<0.001$), presence of co morbidities ($\chi^2=13.4$, $p<0.001$), long term use of medications ($\chi^2=13.7$, $p<0.001$), strained interpersonal relationships ($\chi^2=17.2$, $p<0.001$), physical activity ($\chi^2=7.93$, $p=0.019$) and number of rooms at the place of stay ($\chi^2=6.82$, $p=0.033$) were statistically significant.

Table 2 shows the association between socio demographic variables and sleep hygiene practices. Among the 382 students, 46.1% ($n=176$) of them had good sleep hygiene and 53.9% ($n=206$) of them had poor sleep hygiene practices. In the bivariate analysis using Pearson's chi squared test, the sociodemographic and lifestyle variables which were statistically significant were accommodation ($\chi^2=10.8$, $p=0.004$), self-satisfaction with academic performance/work ($\chi^2=15.2$, $p<0.001$), family history of diagnosed sleep disorders ($\chi^2=8.37$, $p=0.004$), occurrence of headache and use of self-medication ($\chi^2=29.5$, $p<0.001$), long term use of medications ($\chi^2=5.35$, $p=0.021$), strained interpersonal relationships ($\chi^2=4.21$, $p=0.04$), number of rooms at the place of stay ($\chi^2=6.5$, $p=0.039$) and screen time during weekends ($\chi^2=6.84$, $p=0.009$).

(Table 3) binomial logistic regression was applied to check the association between component scores of sleep quality and sleep hygiene practices. The analysis determined the likelihood of having a "bad score" versus a "good score" for each component based on sleep hygiene status, summarized by the odds ratio (OR), Z score, and corresponding p value. Based on the p values (<0.05), the binomial logistic regression revealed statistically significant associations between sleep hygiene status and three components of sleep quality:

Habitual sleep efficiency

The association was significant ($Z=2.453$, $p=0.014$). The odds ratio (OR) of 2.5 indicates that individuals with poor sleep hygiene were over 2.5 times more likely to have a bad score for habitual sleep efficiency component of PSQI.

Day time dysfunction

This component showed the strongest statistical association ($Z=3.581$, $p<0.001$). The odds ratio was 2.5, meaning students with poor sleep hygiene had approximately 2.57 times more chances of experiencing greater daytime dysfunction.

Sleep disturbance

This association was borderline statistically significant ($Z=1.952$, $p=0.041$). The odds ratio of 1.9 suggests that poor sleep hygiene may be associated with nearly twice the odds of experiencing greater sleep disturbance.

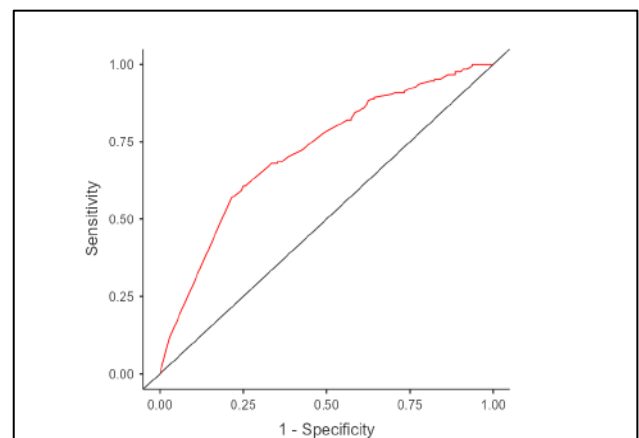


Figure 1: Receiver operating characteristic - ROC curve.

The predictive performance of the model was further evaluated using the ROC curve, which yielded an AUC of 0.718. (Figure 1) The receiver operating characteristic (ROC) curve evaluates the model's ability to correctly classify individuals with poor sleep hygiene versus good sleep hygiene across all possible probability thresholds. Unlike a single accuracy value at a fixed cutoff (usually 0.5), the ROC curve provides a comprehensive assessment of model performance by balancing, sensitivity (true positive rate) and specificity (true negative rate). In this study, the model achieved an AUC (area under the curve) of 0.718, indicating fair to acceptable discriminative ability. This means the model can correctly distinguish individuals with poor sleep hygiene approximately 72% of the time.

Table 1: Association between various socio demographic variables and sleep quality by PSQI (n=382).

Variables	Good sleep quality, N (%)	Poor sleep quality, N (%)	χ ² value (Chi-squared value)	P value	Odds ratio (95% CI)
Age (years)					
<20	46 (27.7)	44 (20.4)	2.81	0.094	0.2 (-0.02 to 0.42)
≥20	120 (72.3)	172 (79.6)			
Gender					
Male	60 (36.1)	69 (31.9)	0.74	0.39	0.09 (-0.01 to 0.30)
Female	106 (63.9)	147 (68.1)			
Course					
MBBS	131 (78.9)	151 (69.9)	3.94	0.139	0.21 (0.00 to 0.42)
Internship	20 (12.0)	37 (17.1)			
Junior residents	15 (9.0)	28 (13.0)			
Accommodation					
Hostel	44 (26.5)	78 (36.1)	4.9	0.086	-0.11 (-0.28 to 0.05)
Home	93 (56.0)	98 (45.4)			
Rented apartment	29 (17.5)	40 (18.5)			
Type of Family for those who stay at home					
Nuclear	91 (54.8)	106 (49.1)	4.94	0.177	0.13 (-0.03 to 0.3)
Joint	16 (9.6)	20 (9.3)			
3 generation family	15 (9)	12 (5.6)			
No response	44 (26.5)	78 (36.1)			
Self-satisfaction with academic performance/Work					
Yes	109 (65.7)	97 (44.9)	16.3	<0.01*	0.40 (0.22 to 0.57)
No	57 (34.3)	119 (55.1)			
Family history of diagnosed sleep disorders					
Yes	10 (6)	39 (18.1)	12.2	<0.001*	-0.54 (-0.80 to -0.29)
No	156 (94.0)	177 (81.9)			
Occurrence of headache and use of self-medication					
Yes	45 (27.1)	97 (44.9)	12.7	<0.001*	-0.37 (-0.56 to -0.18)
No	121 (72.9)	119 (55.1)			
Presence of co morbidities (obesity, DM, HTN, PCOS-female gender)					
Yes	20 (12.3)	56 (28.0)	13.4	<0.001*	-0.47 (-0.68 to -0.25)
No	143 (87.7)	144 (72.0)			
Long term use of any medications					
Yes	8 (4.8)	37 (17.1)	13.7	<0.001*	-0.60 (-0.85 to -0.35)
No	158 (95.2)	179 (82.9)			
Strained interpersonal relationships(family/friends/peer)					
Yes	17 (10.2)	59 (27.3)	17.2	<0.001*	-0.53 (-0.74 to -0.32)
No	149 (89.8)	157 (72.7)			
Physical activity in addition to work (no of times per week)					
0	35 (21.1)	68 (31.5)	7.93	0.019*	-0.09 (-0.27 to -0.07)
1-3	105 (63.3)	106 (49.1)			
≥4	26 (15.7)	42 (19.4)			
Total members at the place of stay					
1-5	142 (85.5)	179 (82.9)	1.89	0.388	0.107 (-0.16 to 0.38)
6-25	23 (13.9)	32 (14.8)			
≥25	1 (0.6)	5 (2.3)			
No of rooms at the place of stay					
≤2	64 (38.6)	109 (50.7)	6.82	0.033*	-0.18 (-0.36 to -0.00)
3-5	91 (54.8)	89 (41.4)			
≥6	11 (6.6)	17 (7.9)			
Screen time-weekdays					
≤2 hours	39 (23.5)	47 (21.8)	0.16	0.68	0.04 (-0.19 to 0.29)
>2 hours	127 (76.5)	169 (78.2)			
Screen time-weekends					
≤4 hours	56 (33.7)	56 (25.9)	2.76	0.097	0.18 (-0.02 to 0.39)
>4 hours	110 (66.3)	160 (74.1)			

Note: p value less than 0.05*.

Table 2: Association between various socio demographic variables and sleep hygiene practices by (n=382).

Variables	Good sleep hygiene, N (%)	Poor sleep hygiene, N (%)	χ ² value (Chi-squared value)	P value	Odds Ratio (95% CI)
Age (years)					
<20	42 (23.9)	48 (23.3)	0.01	0.897	0.01 (-0.02 to 0.25)
≥20	134 (76.1)	158 (76.7)			
Gender					
Male	55 (31.3)	74 (35.9)	0.92	0.336	-0.10 (-0.31 to 0.10)
Female	121 (68.8)	132 (64.1)			
Course					
MBBS	133 (75.6)	149 (72.3)	0.88	0.644	0.08 (-0.12 to 0.29)
Internship	26 (14.8)	31 (15.0)			
Junior residents	17 (9.7)	26 (12.6)			
Accommodation					
Hostel	67 (38.1)	55 (26.7)	10.8	0.004*	0.08 (0.08 to 0.26)
Home	72 (40.9)	119 (57.8)			
Rented apartment	37 (21.0)	32 (15.5)			
Type of family for those who stay at home					
Nuclear	82 (46.6)	115 (55.8)	6.21	0.102	-0.19 (-0.35 to -0.02)
Joint	14 (8)	22 (10.7)			
3 generation family	13 (7.4)	14 (6.8)			
No response	67 (38.1)	55 (26.7)			
Self-satisfaction with academic performance/Work					
Yes	76 (43.2)	130 (63.1)	15.2	<0.001*	-0.38 (-0.56 to -0.21)
No	100 (56.8)	76 (36.9)			
Family history of diagnosed sleep disorders					
Yes	32 (18.2)	17 (8.3)	8.37	0.004*	0.42 (0.16 to 0.68)
No	144 (81.8)	189 (91.7)			
Occurrence of headache and use of self-medication					
Yes	91 (51.7)	51 (24.8)	29.5	<0.001*	0.53 (0.37 to 0.68)
No	85 (48.3)	155 (75.2)			
Presence of co morbidities (obesity, DM, HTN, PCOS-female gender)					
Yes	39 (23.6)	37 (18.7)	1.33	0.248	0.14 (-0.10 to 0.39)
No	126 (76.4)	161 (81.3)			
Long term use of any medications					
Yes	28 (15.9)	17 (8.3)	5.35	0.021*	0.35 (0.07 to 0.63)
No	148 (84.1)	189 (91.7)			
Strained interpersonal relationships(family/friends/peer)					
Yes	43 (24.4)	33 (16.0)	4.21	0.04*	0.25 (0.02 to 0.49)
No	133 (75.6)	173 (84.0)			
Physical activity in addition to work (no of times per week)					
0	51 (29.0)	52 (25.2)	3	0.223	0.13 (-0.14 to 0.42)
1-3	100 (56.8)	111 (53.9)			
≥4	25 (14.2)	43 (20.9)			
Total members at the place of stay					
1-5	151 (85.8)	170 (82.5)	2.52	0.283	0.11 (-0.15 to 0.38)
6-25	21 (11.9)	34 (16.5)			
≥25	4 (2.3)	2 (1)			
No of rooms at the place of stay					
≤2	92 (52.3)	81 (39.5)	6.5	0.039*	0.23 (0.06 to 0.41)
3-5	74 (42)	106 (51.7)			
≥6	10 (5.7)	18 (8.8)			
Screen time-weekdays					
≤2 hours	35 (19.9)	51 (24.8)	1.29	0.246	-0.14 (-0.37 to 0.09)
>2 hours	141 (80.1)	155 (75.2)			
Screen time-weekends					
≤4 hours	40 (22.7)	72 (35.0)	6.84	0.009*	-0.29 (-0.5 to -0.08)
>4 hours	136 (77.3)	134 (65.0)			

Note: p value less than 0.05*.

Table 3: Binomial logistic regression showing association between component scores of sleep quality and sleep hygiene practices among UG and PG medical students.

Components	Good sleep hygiene, N (%)	Poor sleep hygiene, N (%)	Z score	P value	Odds ratio (95% CI)
Subjective sleep quality					
Good score	116 (65.9)	175 (85.0)	1.489	0.136	1.57 (0.86-2.85)
Bad score	60 (34.1)	31 (15.0)			
Sleep latency					
Good score	96 (54.5)	151 (73.3)	1.795	0.073	1.56 (0.96-2.51)
Bad score	80 (45.5)	55 (26.7)			
Sleep duration					
Good score	114 (64.8)	147 (71.4)	-0.564	0.572	0.86 (0.5-1.45)
Bad score	62 (35.2)	59 (28.6)			
Habitual sleep efficiency					
Good score	145 (82.4)	190 (92.2)	2.453	0.014*	2.53 (1.2-5.32)
Bad score	31 (17.6)	16 (7.8)			
Sleep disturbance					
Good score	124 (70.5)	186 (90.3)	1.952	0.041*	1.96 (1.2-3.89)
Bad score	52 (29.5)	20 (9.7)			
Use of sleeping medication					
Good score	163 (92.6)	200 (97.1)	0.229	0.819	1.14 (0.36-3.54)
Bad score	13 (7.4)	6 (2.9)			
Daytime dysfunction					
Good score	107 (60.8)	173 (84.4)	3.581	< 0.001*	2.57 (1.53-4.32)
Bad score	69 (39.2)	33 (16.0)			

Note: p value less than 0.05*

DISCUSSION

This cross-sectional study investigated the prevalence and determinants of poor sleep quality and poor sleep hygiene practices among undergraduate and postgraduate medical students in a tertiary hospital setting in Navi Mumbai. Our findings indicate a significant burden of sleep issues in this study population, consistent with national and global trends among medical trainees.

Prevalence of poor sleep quality and hygiene

The prevalence of poor sleep quality (PSQI $\geq$ 5) in our study was 56.5%. This falls within the wide range reported in literature on Indian medical students. It is higher than the 49.4% reported among general youth by George et al but lower than the 70% prevalence reported among undergraduates by Mohandas et al, and very close to the 56% prevalence reported by Ahlawat et al among undergraduate medical students.^{5,8,9} This consistent high prevalence underscores that poor sleep is a pervasive problem across different regions and institutions in India. Regarding sleep hygiene, over half of our participants (53.9%) were categorized as having poor sleep hygiene practices higher than the 47.4% reported in a study done by Kanyadi et al and lower than 93.6% in a study by Talaia et al.^{6,16} This finding is significant as poor sleep hygiene is a modifiable risk factor for poor sleep quality.

Poor sleep quality

The bivariate analysis identified several sociodemographic and lifestyle factors significantly associated with PSQI. There was significant association between self-satisfaction with academic performance/work which is in contrast to the study conducted by Mohandas et al, and the study done by Kumari et al.^{5,14} Adjusting to the academic demands of the medical course in the earlier year students and the added pressures of post-graduation entrance exam preparation in the later years could be the contributory factors for this finding. Family history of diagnosed sleep disorders was significantly associated with poor sleep quality which is in contrast to the study done by Kumari et al.¹⁴ Occurrence of headache and use of self-medication is significantly associated with poor sleep quality similar to the study done in Telangana.⁵ Presence of co morbidities (obesity, DM, HTN, PCOS-female gender) has also shown significant association with sleep health which is similar to the study done in Ahlawat et al.⁸ Our study identified that long-term use of any medications was significantly associated with poor sleep quality, indicating that students managing chronic conditions with regular medication are more likely to be experiencing compromised sleep which is in contrast to the findings of the study by Mohandas et al.⁵ Strained interpersonal relationship was an added variable included

in our study and was found to have a profound impact on sleep quality. This could be because a significant portion of students were living away from their families. This distance often resulted in decreased familial engagement and presented ongoing challenges in managing relationships with family, friends, and partners alongside academic responsibilities. Physical activity in addition to work has significant impact on sleep similar to the study by Kaur et al.¹⁷ The students having access to a variety of in-house sport activities could contribute to this finding. Number of rooms at the place of stay showed significant association with sleep quality different from Kumari et al.¹⁴ Many students are from different parts of the state and country because of which they reside together in hostel and rented apartments, which could be a contributing factor for this finding.

Poor sleep hygiene

The bivariate analysis using the sleep hygiene index (SHI) identified several significant determinants of poor sleep hygiene practices. Accommodation significantly affected the sleep hygiene practices which is similar to the findings of Kumari et al and George et al.^{9,14} Self-satisfaction with academic performance/work showed significant association with sleep hygiene similar to the findings of Kanyadi et al.¹⁶ The following findings were specific to this study, family history of diagnosed sleep disorders, occurrence of headache, use of self-medication and long term use of any medications. If a student's immediate family member has a diagnosed disorder, the student is at a higher genetic and biological risk for developing similar issues, which directly compromises their sleep. Presence of headaches and use of medication for it can disrupt the natural sleep cycle and many medications taken long-term can have side effects that interfere with sleep and cause daytime sleepiness. Also, strained interpersonal relationships and number of rooms at the place of stay significantly affected sleep hygiene practices. Poor relationship quality (with friends, partners, or family) is a major source of chronic psychological stress that can affect sleep hygiene. Lower number of rooms can mean shared bedrooms, lack of a private space, and increased ambient noise, light, and movement during the night which disrupts sleep. Screen time during weekends had impacted sleep hygiene in a big way that coincides with the findings of Kanyadi et al.¹⁶ Sleep hygiene practices and its determinants are still not well explored in medical students. This study aimed to fill in that gap in research.

Predictors of poor sleep hygiene

Another important aspect of our study was to examine how specific components of sleep quality relate to overall sleep hygiene status, which was assessed using binomial logistic regression.

We found statistically significant associations between poor sleep hygiene and three major components of poor sleep quality (PSQI):

Daytime dysfunction ($p < 0.001$)

This component showed statistical association. Students with poor sleep hygiene had 2.57 times higher chances of experiencing greater daytime dysfunction, similar to a study done by Kanyadi et al.¹⁶

Habitual sleep efficiency ($p = 0.014$)

Individuals with poor sleep hygiene were over 2.5 times more likely to have a bad score for habitual sleep efficiency which is in contrast to the study done by Kanyadi et al.¹⁶ Students staying far away from their families in hostels and rented apartments and the increased screen time could have contributed to the finding in this study.

Sleep disturbance showed a significant association ($p = 0.041$) with nearly twice the odds ($OR = 1.9$) of a bad score for those with poor sleep hygiene, similar to a study by Kanyadi et al.¹⁶

The current study investigated both UG and PG medical students, which provides a more comprehensive view of sleep health issues across different stages of medical training. Use of globally validated questionnaire like PSQI and SHI adds more value to the study. The study assessed a broad range of sociodemographic and lifestyle factors as potential determinants of both poor sleep quality and poor sleep hygiene. It studied upon sleep hygiene practices, the domain on which less attention is being given in research in our study setting. The use of self-administered questionnaires like the pittsburgh sleep quality index (PSQI) and sleep hygiene index may lead to reporting bias due to inaccurate recall. Convenience sampling method, fewer interns and post graduates' respondents could have underestimated the burden of poor sleep health. The findings are limited to one medical college and tertiary hospital in Navi Mumbai, which may restrict generalizability to other institutions or regions. Students with psychiatric illnesses or on medications affecting sleep were excluded, which may underrepresent the full spectrum of sleep issues in medical students.

CONCLUSION

This cross-sectional study revealed a substantial burden of poor sleep health among the undergraduate and postgraduate medical students. The high prevalence of poor sleep quality and hygiene signals a critical public health concern for the cognitive function and long-term health of future healthcare providers. Addressing the modifiable factors of sleep health is essential for enhancing the overall well-being, academic competency, and professional performance of medical students and residents. Integrate sleep health education, introduce

interactive modules on effective sleep hygiene practices into the MBBS and residency curriculum. Students should have access to confidential mental health counselling, buddy programs and stress management services. Measures should be taken to actively promote more students to access the physical activity programs and adopt the practice of technology- free period before bedtime which can improve sleep health.

ACKNOWLEDGEMENTS

The authors sincerely acknowledge the valuable participation and cooperation of the undergraduate students, interns, and postgraduate students who took part in this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Clement-Carbonell V, Portilla-Tamarit I, Rubio-Aparicio M, Madrid-Valero JJ. Sleep quality, mental and physical health: a differential relationship. *Int J Environ Res Public Health*. 2021;18(2):1-8.
- Desai D, Patel M, Patel A. Study of sleep habits and related problems among medical students. *J Neurol Neurophysiol*. 2023;14(4):1-4.
- Grandner MA. Sleep, health, and society. *Sleep Med Clin*. 2020;15(2):319-40.
- Kang JH, Chen SC. Effects of an irregular bedtime schedule on sleep quality, daytime sleepiness, and fatigue among university students in Taiwan. *BMC Public Health*. 2009;9(248).
- Mohandas A, Patnala L, Shalini MB, Varma P, Sharma S, Pattnaik S. Sleep quality and its predictors among undergraduate medical students of a teaching institute in Telangana, south India: a cross-sectional study. *CHRISMED J Health Res*. 2024;11:17-22.
- Talaia A, Sowidan A, Fahim A, Elzohery A, Hammada A, Kabbash I. Sleep hygiene practices and sleep quality among medical students in Egypt: a cross-sectional study. *Sleep Sci Pract*. 2025;9:6.
- Alsaggaf MA, Wali SO, Merdad RA, Merdad LA. Sleep quantity, quality, and insomnia symptoms of medical students during clinical years: Relationship with stress and academic performance. *Saudi Med J*. 2016;37(2):173-82.
- Ahlawat P, Dwivedi A, Dwivedi N, Mahuar G, Mahaur M, Singh K, et al. Sleep quality and associated factors among undergraduate medical students in Delhi. *Int J Community Med Public Health*. 2024;11(5):1907-12.
- George N, Earnesteen L, George M, Dharmaraj RB, Mohandas NV, Anand VV, et al. Sleep quality, daytime sleepiness and sleep hygiene among youth in a rural district in south India: a cross-sectional study. *Cureus*. 2024;16(9):e69551.
- Baglioni C, Nanovska S, Regen W, Spiegelhalder K, Feige B, Nissen C, et al. Sleep and mental disorders: a meta-analysis of polysomnographic research. *Psychol Bull*. 2016;142(9):969-90.
- Irish LA, Kline CE, Gunn HE, Buysse DJ, Hall MH. The role of sleep hygiene in promoting public health: a review of empirical evidence. *Sleep Med Rev*. 2015;22:23-36.
- Mastin DF, Bryson J, Corwyn R. Assessment of sleep hygiene using the Sleep Hygiene Index. *J Behav Med*. 2006;29(3):223-7.
- Yazdi Z, Loukzadeh Z, Moghaddam P, Jalilolghadr S. Sleep hygiene practices and their relation to sleep quality in medical students of Qazvin University of Medical Sciences. *J Caring Sci*. 2016;5(2):153-60.
- Kumari R, Jain K, Nath B. Sleep quality assessment among college students using Pittsburgh Sleep Quality Index in a municipal corporation area of Uttarakhand, India. *Ceylon Med J*. 2020;65:86-94.
- Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatr Res*. 1989;28(2):193-213.
- Kanyadi SR, Shindhe VM, Kamate RP, Javali SB. Sleep hygiene practices and sleep quality among undergraduate medical students: a cross-sectional study. *Nat J Community Med*. 2025;16.
- Kaur G. A study on the sleep quality of Indian college students. *JSM Brain Sci*. 2018;3(1):1018.

Cite this article as: Aishwarya SR, Pinto V, Joshi S, Mohokar A, Singh T. Sleep quality and sleep hygiene practices among the undergraduate and post graduate medical students in a medical college and tertiary hospital, Navi Mumbai: a cross-sectional study. *Int J Community Med Public Health* 2026;13:4526-33.