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Psychosocial and Family Factors Associated With Sleep Quality Among Undergraduate Medical Students in Ho Chi Minh City: A Cross-Sectional Study

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Research Article

Keywords: Sleep quality, Medical students, Pittsburgh Sleep Quality Index, Family cohesion, Ho Chi Minh City

Posted Date: March 3rd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8999345/v1

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Additional Declarations: No competing interests reported.

Abstract

Objective

To determine the prevalence of sleep quality and identify factors independently associated with poor sleep quality among undergraduate medical students in Ho Chi Minh City, Vietnam.

Design

Cross-sectional study.

Setting

The study was conducted during the year 2025 at the University of Medicine and Pharmacy at Ho Chi Minh City, a major medical training institution in Vietnam.

Participants

A total of 846 undergraduate medical students from the Doctor of Preventive Medicine and Traditional Medicine programs participated in the study. The median age was 22 years, and 66.0% were female.

Outcome measures

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). A global score greater than 5 was defined as poor sleep quality. Multivariable logistic regression analysis was employed to identify psychosocial, family, and behavioral factors independently associated with poor sleep quality.

Results

The prevalence of poor sleep quality among the participants was 44.09%. In the multivariable model, bullying or abuse showed the strongest association with poor sleep (aOR = 4.86, 95% CI 2.60 to 9.08, $p < 0.001$). Poor sleep quality was also significantly associated with family problems (aOR = 1.91, 95% CI 1.32 to 2.77), serious illness (aOR = 2.01, 95% CI 1.01 to 4.00), and smoking (aOR = 3.94, 95% CI 1.02 to 15.25). Furthermore, diminishing family cohesion was a critical predictor, with students reporting no family bonding having over threefold higher odds of poor sleep (aOR = 3.21, 95% CI 1.20 to 8.57). Conversely, having parents in manual occupations, such as fathers as workers (aOR = 0.58) or mothers as farmers (aOR = 0.62), appeared to be protective.

Conclusions

Poor sleep quality is highly prevalent among medical students in Ho Chi Minh City, influenced by a complex interplay of academic rigor and systemic stressors in the post COVID 19 era. Psychosocial stressors, particularly interpersonal trauma and family dysfunction, serve as dominant determinants independent of traditional lifestyle factors. These results suggest that university health services should prioritize trauma informed mental health screenings and systemic interventions to support the well being of the future healthcare workforce.

1. INTRODUCTION

Sleep is a fundamental biological process that is essential for physical health, cognitive function, and overall well-being. Adequate sleep quality has been associated with improved attention, problem-solving ability, and memory consolidation factors that are critical for academic success and clinical performance in medical training. Conversely, poor sleep quality can adversely affect alertness, daytime functioning, and learning capacity. Systematic evidence also suggests that insufficient or disrupted sleep is linked to negative health outcomes, including metabolic and cardiovascular disorders [1].

Medical students represent a population with unique academic demands, long study hours, and substantial clinical responsibilities, all of which may compromise regular sleep patterns. Previous research has consistently shown that poor sleep quality is common among medical students globally. A comprehensive meta-analysis of observational studies involving 25,735 medical students found that the pooled prevalence of poor sleep quality typically measured using the Pittsburgh Sleep Quality Index (PSQI) was approximately 52.7% (95% CI: 45.3% to 60.1%) [2]. Similar global estimates indicate that, across a larger sample of 54,894 medical students, over half (about 55.6%) experienced poor sleep quality. The average sleep duration for medical students was only 6.5 hours per night [95%CI 6.24; 6.64], which indicates that at least 30% of them slept less than the recommended 7–9 hours per night [1]. Region-specific reviews also report substantial prevalence: in the Middle East and North Africa, pooled estimates of poor sleep quality among medical students reached 59.1%, with individual studies ranging from 42.1% to 73.5% [3]. Individual cross-sectional studies further support these findings. For example, one descriptive study reported that 44.2% of medical students had poor sleep quality based on PSQI scores greater than 5, with a mean sleep duration of 6.7 hours per night [4]. These findings suggest that poor sleep quality is a pervasive issue in medical education and may have important implications for students academic performance and well-being. However, evidence on psychosocial and family determinants of sleep quality among medical students in Vietnam remains limited, particularly regarding exposure to interpersonal trauma .

Despite the growing body of international evidence, there are limited studies that specifically describe sleep quality among medical students in Vietnam, particularly in major training centers such as Ho Chi Minh City. Understanding the prevalence and characteristics of sleep quality in this population is

essential for informing targeted interventions and health promotion strategies within medical curricula. Accordingly, this study “Psychosocial and family factors associated with sleep quality among undergraduate medical students in Ho Chi Minh City: a cross-sectional study” was conducted to characterize sleep quality among undergraduate medical students in 2025.

Objectives

General objective

To determine the prevalence of poor sleep quality and to identify factors associated with poor sleep quality among undergraduate medical students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, in 2025.

Specific objectives

1. To determine the prevalence of poor sleep quality among undergraduate medical students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, in 2025.
2. To describe sleep characteristics, including sleep duration, sleep latency, sleep disturbances, and daytime dysfunction, among undergraduate medical students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, in 2025.
3. To identify socio-demographic factors associated with poor sleep quality among undergraduate medical students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, in 2025.
4. To identify academic-related factors associated with poor sleep quality among undergraduate medical students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, in 2025.

2. METHOD

Study design and setting

This study employed a cross-sectional design. The study was conducted among undergraduate medical students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. Data were collected during the year 2025.

The University of Medicine and Pharmacy at Ho Chi Minh City is one of the largest and most prestigious medical training institutions in Vietnam, enrolling students from various regions of the country. Undergraduate medical students at this institution undergo intensive academic coursework combined with practical and clinical training, which may influence their sleep patterns and overall well-being.

During the study period, participants were attending regular academic and clinical activities according to the university curriculum. The study setting provided an appropriate context to assess sleep quality and related factors among medical students in an urban medical education environment.

Participants

Inclusion criteria

Undergraduate medical students who were officially enrolled in the medical training program at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, during the study period in 2025 were eligible to participate.

Participants were required to be present at the time of data collection, able to understand and complete the self-administered questionnaire, and willing to provide written informed consent prior to participation.

Exclusion criteria

Students were excluded if they were absent during the data collection period, declined to participate, or withdrew consent at any stage of the study.

Questionnaires with missing or incomplete data on key variables related to sleep quality were also excluded from the final analysis.

Sample and data collection

A total of 844 undergraduate medical students were included in this cross-sectional study conducted at the University of Medicine and Pharmacy at Ho Chi Minh City (UMP), Vietnam, in 2025. Two undergraduate medical programs were randomly selected from the list of medical training programs at the university, including the Doctor of Preventive Medicine program and the Traditional Medicine program.

Eligible students from the selected programs were invited to participate in the study. Of these, 422 students were from the Doctor of Preventive Medicine program and 422 students were from the Traditional Medicine program. A convenience sampling method was applied within each selected program to recruit students who met the inclusion criteria and were present during the data collection period.

Data were collected using a structured, self-administered questionnaire that included socio-demographic and academic characteristics and sleep quality assessed using the Pittsburgh Sleep Quality Index (PSQI). Questionnaires were distributed during scheduled class sessions with permission from the university administration. Participation was voluntary and anonymous, and written informed consent was obtained prior to data collection.

Completed questionnaires were reviewed for completeness before data entry. Questionnaires with missing or incomplete data on key variables related to sleep quality were excluded from the final analysis.

Survey instruments

Data were collected using a structured, self-administered questionnaire comprising two main sections. The first section collected information on socio-demographic and academic characteristics, including age, sex, year of study, field of study, living arrangements, and academic workload related factors.

The second section assessed sleep quality using the Pittsburgh Sleep Quality Index (PSQI), a widely used and validated instrument for measuring sleep quality over the past month. The PSQI consists of 19 self-rated items that generate seven component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The sum of these components yields a global PSQI score ranging from 0 to 21, with higher scores indicating poorer sleep quality. A global PSQI score greater than 5 was used to define poor sleep quality, consistent with established recommendations and previous studies. The PSQI has been demonstrated to have good reliability and validity across diverse populations, including university students and medical students [5].

Exposure to adverse events was assessed using self-reported items adapted from the Life Events Checklist.

In this study, the questionnaire was administered in Vietnamese. Participants completed the questionnaire anonymously to ensure confidentiality and reduce reporting bias.

Data analysis

Data were entered, cleaned, and analyzed using Stata software version 17.0 (StataCorp LLC, College Station, TX, USA). Descriptive statistics were used to summarize socio-demographic and academic characteristics and sleep-related variables. Categorical variables were presented as frequencies and percentages, while continuous variables were described using means and standard deviations or medians and interquartile ranges, as appropriate.

Sleep quality was assessed using the global Pittsburgh Sleep Quality Index (PSQI) score. A PSQI score greater than 5 was used to classify participants as having poor sleep quality. The prevalence of poor sleep quality was calculated and presented as percentages.

Bivariate analyses were conducted to examine associations between sleep quality and socio-demographic. The chi-square test or Fisher's exact test was used for categorical variables, while the independent-samples t-test or Mann–Whitney U test was applied for continuous variables, depending on the distribution of the data. Variables with $p < 0.20$ in bivariate analysis were entered into the multivariable model.

Ethics

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval for the study was obtained from the Ethics Committee of the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam.

Participation in the study was entirely voluntary. All eligible students were informed about the objectives, procedures, potential risks, and benefits of the study prior to participation. Written informed consent was obtained from all participants before data collection.

To ensure confidentiality and anonymity, no personal identifiers were collected. Data were used solely for research purposes and were accessible only to the research team. Participants were informed of their right to decline participation or withdraw from the study at any time without any academic or personal consequences.

3. RESULTS

3.1. General characteristics of the students participating in the study

Table 3.1. Personal characteristics of the students included in the study (n = 846)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
Median (IQR)	22 (20–23)	
Minimum–Maximum	19 – 32	
Sex		
Male	288	34.0
Female	558	66.0
Religion		
No religion	576	68.1
Buddhism	152	18.0
Christianity	104	12.3
Other	14	1.6
Year of study		
Year 1	158	18.7
Year 2	132	15.6
Year 3	152	18.0
Year 4	120	14.2
Year 5	144	17.0
Year 6	140	16.5
Current living arrangement		
Living with parents	340	40.2
Living with relatives	60	7.1
Own house/apartment	22	2.6
Rented accommodation	348	41.1
Living with friends	28	3.3
Dormitory	46	5.4
Self-rated health status		
Poor	348	41.1
Good	498	58.9

Adverse events in the past year		
None	400	47.3
Loss of a family member/friend	140	16.5
Family-related problems	206	24.4
Bullying/abuse	58	6.9
Serious illness	42	5.0

Table 3.1 shows that, after pooling data from the two studies, the final sample consisted of 846 students from two health sciences disciplines. The median age of the participants was 22 years (IQR: 20–23), indicating that the study population primarily comprised students in the core academic phase of undergraduate education.

Female students predominated (66.0%), which is consistent with the gender distribution commonly observed in health sciences programs in Vietnam. The majority of students reported no religious affiliation (68.1%), followed by Buddhism (18.0%).

Students were relatively evenly distributed across academic years, with the highest proportions observed in Year 1 and Year 3, suggesting that the sample adequately represented different stages of undergraduate training.

Regarding living conditions, most students resided in rented accommodation or with their families, reflecting the common situation of students studying away from home. Notably, 41.1% of students rated their health as poor, and more than half experienced at least one adverse event during the past year. These baseline characteristics represent important contextual factors to be considered when analyzing mental health outcomes and sleep quality among university students.

3.2. Family characteristics of the students participating in the study

Table 3.2. Family cohesion characteristics of the students (n = 846)

Characteristics	Frequency (n)	Percentage (%)
Satisfied with family support when facing problems		
Rarely	19	2.25
Sometimes	127	15.01
Always	700	82.74
Satisfied with the way the family shares problems		
Rarely	41	4.85
Sometimes	382	45.15
Always	423	50.00
Satisfied with the family's acceptance and support of personal wishes		
Rarely	16	1.89
Sometimes	194	22.93
Always	636	75.18
Satisfied with the way the family expresses affection		
Rarely	21	2.48
Sometimes	205	24.23
Always	620	73.29
Satisfied with the way the family shares time together		
Rarely	51	6.03
Sometimes	280	33.10
Always	515	60.87

Results from Table 3.2 indicate that the overall level of family cohesion among the participating students was high. The majority of students reported being always satisfied with family support when facing difficulties (82.74%), highlighting the important role of the family as a key source of emotional and practical support in students' lives. Similarly, high proportions of students were always satisfied with the family's acceptance and support of personal wishes (75.18%) and with the way the family expresses affection (73.29%), suggesting a generally positive and encouraging family environment.

However, the proportion of students who reported being always satisfied with the way their family shares problems (50.00%) and spends time together (60.87%) was lower compared with other dimensions.

Notably, a substantial proportion of students reported being only sometimes satisfied with family problem-sharing (45.15%) and time spent together (33.10%). These findings suggest that, although emotional support and personal acceptance were highly rated, regular interaction and communication within the family may not be equally consistent across all students.

Overall, the findings indicate that students in this study experienced a relatively high level of family cohesion, particularly in terms of support and personal acceptance. Nevertheless, aspects related to bidirectional communication and shared family time appear to have room for improvement and may warrant further consideration in subsequent analyses examining students' mental health and behavioral outcomes.

Table 3.3. Family cohesion among students (n = 846)

Characteristics	Frequency (n)	Percentage (%)
APGAR score	8.25 ± 2.07	
Mean ± SD	0 – 10	
Minimum–Maximum		
Family APGAR classification		
Severely dysfunctional	23	2.72
Moderately dysfunctional	226	26.71
Highly functional	597	70.57

Results from Table 3.3 indicate that the level of family cohesion among the participating students was relatively high, as reflected by a mean APGAR score of 8.25 ± 2.07 on a scale ranging from 0 to 10. This mean value falls within the upper range of the scale, suggesting that, overall, students reported a substantial degree of satisfaction with family functioning and support.

When classified by level of family cohesion, the majority of students were categorized as having highly functional families (70.57%), whereas 26.71% were classified as moderately dysfunctional. Only a small proportion of students (2.72%) fell into the severely dysfunctional category, indicating that severe family dysfunction was relatively uncommon in this study population.

Overall, these findings confirm that the family remains an important source of support for most students in the study. Nevertheless, the fact that nearly 30% of students exhibited suboptimal or poor family cohesion suggests the presence of a potentially vulnerable subgroup. This group warrants further attention in subsequent analyses to elucidate the associations between family cohesion and students' mental health, academic performance, and behavioral outcomes.

Table 3.4. Family characteristics of the students participating in the study (n = 846)

Characteristics	Frequency (n)	Percentage (%)
Birth order		
Only child	121	14.30
First-born	345	40.78
Middle child	123	14.54
Youngest child	257	30.38
Parental marital status		
Living together	724	85.58
Separated	22	2.60
Divorced	55	6.50
Remarried	6	0.71
Single parent	14	1.65
Widowed	25	2.96
Father's occupation		
Government officer/civil servant	185	21.87
Office staff	64	7.57
Business owner	172	20.33
Factory worker	64	7.57
Farmer	119	14.07
Freelance laborer	158	18.68
Homemaker	13	1.54
Other	71	8.39
Mother's occupation		
Government officer/civil servant	186	21.99
Office staff	56	6.62
Business owner	159	18.79
Factory worker	51	6.03
Farmer	86	10.17
Freelance laborer	96	11.35

Homemaker	178	21.04
Other	34	4.02
Perceived family economic status		
Financially difficult	71	8.39
Adequate	659	77.90
Well-off	107	12.65
Affluent	9	1.06
Source of income		
Fully supported by parents	640	75.65
Self-supported	25	2.96
Partially supported by parents and partially self-supported	181	21.39
Perceived monthly living expenses		
Insufficient	103	12.17
Sufficient	649	76.71
Surplus	94	11.12
Working hours (part-time)		
Mean ± SD	4.95±12.8	
Minimum–Maximum	0-150	

The results indicate that the family characteristics and socioeconomic conditions of the participating students were diverse but generally stable. Regarding birth order, first-born students accounted for the largest proportion (40.78%), followed by youngest children (30.38%), while the proportions of only children and middle children were relatively similar (approximately 14% each). This distribution reflects the common family structure in Vietnam, where students typically grow up in families with two or more children.

In terms of parental marital status, the majority of students reported that their parents were living together (85.58%), suggesting a relatively stable family environment. Nevertheless, a notable proportion of students had parents who were divorced or separated (approximately 9%), along with other family situations such as widowhood or single parenthood, indicating the presence of family circumstances that may potentially affect students' psychological well-being and daily life.

With respect to parental occupations, a wide range of employment categories was observed. Among fathers, government officers/civil servants (21.87%), business owners (20.33%), and freelance laborers (18.68%) were the most prevalent. Among mothers, government officers/civil servants (21.99%) and

homemakers (21.04%) were the two most common occupational groups. These patterns reflect the persistence of traditional gender roles within household labor structures.

Subjective assessments of family economic status showed that most students perceived their families as financially adequate (77.90%), whereas 8.39% reported financial difficulty and only a small proportion perceived their families as well-off or affluent. Consistent with these findings, the majority of students reported being fully financially supported by their parents (75.65%), and only a small proportion were entirely self-supported. Perceptions of monthly living expenses were also predominantly rated as sufficient (76.71%); however, more than 12% of students considered their expenses insufficient, indicating that financial pressure remains present for a subset of students.

Finally, the mean number of part-time working hours was 4.95 ± 12.8 hours, with a very wide range (0–150 hours), reflecting substantial variability in students' engagement in paid work. This finding suggests that, although most students relied financially on their families, a subgroup of students spent considerable time working part-time, which may have implications for academic performance and health outcomes.

3.3. School-related characteristics of the students participating in the study

Table 3.5. School-related characteristics of the students participating in the study (n = 846)

Characteristics	Frequency (n)	Percentage (%)
Academic performance		
Excellent	48	5,67
Very good	158	18,68
Good	412	48,70
Average	179	21,16
Poor	49	5,79
Participation in extracurricular activities		
Never	118	13,95
Rarely	231	27,30
Sometimes	331	39,13
Often	124	14,66
Very often	42	4,96
Relationships with peers		
Poor	29	3,43
Fair	320	37,83
Good	362	42,79
Very good	135	15,95

The descriptive results indicate that students' academic performance and social relationships were generally favorable. Regarding academic performance, nearly half of the students achieved a good level (48.70%), followed by those rated as very good or excellent (24.35% combined), suggesting that the majority of students attained at least a moderate-to-good academic level. Nevertheless, approximately 26.95% of students were classified as having average or poor academic performance, indicating the presence of a subgroup that may require additional academic support.

In terms of participation in extracurricular activities, students most commonly reported participating sometimes (39.13%) or rarely (27.30%), whereas the proportions reporting frequent or very frequent participation were relatively low (19.62%). This pattern suggests that students' engagement in activities beyond formal coursework was limited, potentially due to academic workload, financial constraints, or time limitations.

With respect to relationships with peers, the majority of students rated their relationships as good or very good (58.74%), reflecting a generally supportive social environment. Only a small proportion of students reported poor peer relationships (3.43%). However, nearly 38% rated their relationships as fair, indicating

that there remains room for improvement in the quality of social interactions and peer support within the student community.

Overall, these findings suggest that while students in the study generally demonstrated adequate academic performance and positive peer relationships, their participation in extracurricular activities was relatively limited. These factors should be considered jointly in subsequent analyses to better elucidate the role of academic and social environments in students' mental health and overall development.

3.4. Sleep quality characteristics of the study participants

Table 3.6. Characteristics of sleep quality components (n = 846)

Characteristics	Frequency (n)	Percentage (%)
Overall sleep quality		
Poor	373	44.09
Good	473	55.91
Component 1: Subjective sleep quality		
Very good	166	19.62
Fairly good	511	60.40
Fairly bad	155	18.33
Very bad	14	1.65
Component 2: Sleep latency		
Time to fall asleep		
≤ 15 minutes	519	61.35
16–30 minutes	235	27.78
31–60 minutes	77	9.10
> 60 minutes	15	1.77
Unable to fall asleep within 30 minutes		
Not during the past month	342	40.43
Less than once a week	227	26.83
Once or twice a week	161	19.03
Three or more times a week	116	13.71
Component 3: Sleep duration		
≥ 7 hours	378	44.68
6 to < 7 hours	240	28.37
5 to < 6 hours	142	16.78
< 5 hours	86	10.17
Component 4: Habitual sleep efficiency		
< 65%	310	36.64
65–75%	88	10.40
75 to < 85%	117	13.83

≥ 85%	331	39.13

Results indicated that the overall sleep quality of students in this study was at a moderate level. Specifically, 55.91% of students were classified as having good sleep quality, while a considerable proportion (44.09%) experienced poor sleep quality. This finding suggests that suboptimal sleep remains a prevalent issue among the study population.

Regarding subjective sleep quality, the majority of students perceived their sleep as fairly good (60.40%) or very good (19.62%). Nevertheless, approximately 20% of students rated their sleep as fairly poor or very poor, indicating notable inter-individual variability in sleep perception and experience.

In terms of sleep latency, most students were able to fall asleep relatively quickly, with 61.35% reporting sleep onset within ≤15 minutes and 27.78% within 16–30 minutes. Despite this, a substantial proportion of students reported difficulties initiating sleep, as 59.57% experienced at least one episode per week of being unable to fall asleep within 30 minutes. Notably, 13.71% reported this problem occurring three or more times per week.

With respect to sleep duration, only 44.68% of students achieved the recommended sleep duration of at least 7 hours per night. More than half of the participants slept less than 7 hours, and 10.17% reported sleeping fewer than 5 hours per night, highlighting a concerning risk of chronic sleep deprivation among a significant subset of students.

Finally, when examining habitual sleep efficiency, although 39.13% of students demonstrated high sleep efficiency (≥85%), a considerable proportion (36.64%) exhibited low sleep efficiency (<65%). This finding underscores that, beyond sleep duration, the continuity and overall quality of sleep remain important concerns.

The results reveal multiple suboptimal sleep-related characteristics among students, particularly in terms of sleep duration, sleep initiation difficulties, and sleep efficiency. These aspects warrant further investigation in subsequent analyses to elucidate their associations with mental health outcomes, academic performance, and family cohesion among students.

Table 3.7. Characteristics of sleep-related disturbances among students (n = 846)

Sleep disturbances	None n (%)	<1 time/week n (%)	1–2 times/week n (%)	≥3 times/week n (%)
Waking up during the night or too early	408 (48,2)	217 (25,7)	162 (19,1)	59 (7,0)
Having to get up to use the bathroom	569 (67,3)	170 (20,1)	80 (9,5)	27 (3,2)
Difficulty breathing	727 (85,9)	73 (8,6)	32 (3,8)	14 (1,7)
Coughing or loud snoring	686 (81,1)	93 (11,0)	50 (5,9)	17 (2,0)
Feeling very cold	568 (67,1)	165 (19,5)	80 (9,5)	33 (3,9)
Feeling very hot	511 (60,4)	183 (21,6)	103 (12,2)	49 (5,8)
Nightmares	568 (67,1)	169 (20,0)	81 (9,6)	28 (3,3)
Pain or discomfort	628 (74,2)	120 (14,2)	64 (7,6)	34 (4,0)
Other reasons	653 (77,2)	113 (13,4)	60 (7,1)	20 (2,4)

Among the 846 study participants, the majority did not report sleep disturbances at a high frequency. The most commonly reported symptom was waking up during the night or waking up too early, which was observed in 51.8% of participants at a frequency ranging from less than once per week to three or more times per week. This was followed by feeling excessively hot during sleep (39.6%) and having to get up to use the bathroom at night (32.7%).

Sleep-related respiratory symptoms, such as difficulty breathing or coughing/loud snoring, were reported less frequently, with more than 80% of participants indicating that they did not experience these symptoms.

Notably, most sleep disturbance symptoms occurred at a mild and infrequent level, typically less than one to two times per week. The proportion of participants reporting high-frequency disturbances (≥3 times per week) remained below 7% for most assessed symptoms. These findings suggest that sleep disturbances in the study population were predominantly mild to moderate in severity, characterized by transient rather than persistent or severe manifestations.

Table 3.8. Daytime functional disorders (n=846)

Characteristics	Frequency (n)	Percentage (%)
Component 6: Use sleeping pills		
Yes	58	6.9
No	788	93.1
Component 7: Daytime dysfunction		
Difficulty staying awake during daily activities		
No difficulty	504	59,6
< 1 time/week	181	21,4
1–2 times/week	114	13,5
≥ 3 times/week	47	5,5
Difficulty maintaining enthusiasm to get things done		
No difficulty		
Slight difficulty	191	22,6
Moderate difficulty	415	49,1
Severe difficulty	188	22,2
	52	6,1

Results indicate that daytime dysfunction was relatively common among the study participants. Regarding the ability to remain alert during daily activities, 40.4% of participants reported difficulties at varying frequencies, with 13.5% experiencing this problem 1–2 times per week and 5.5% reporting occurrences of three or more times per week, indicating a substantial level of daytime sleepiness in a notable proportion of the sample.

In terms of maintaining enthusiasm to accomplish daily tasks, the majority of participants (77.4%) reported some degree of difficulty. These difficulties were predominantly mild (49.1%) or moderate (22.2%), while 6.1% experienced severe difficulty. These findings suggest that daytime dysfunction not only manifests as reduced alertness but also has a marked impact on daily performance and work motivation.

3.5. Factors associated with the quality of sleep

In the multivariable logistic regression analysis, several factors remained significantly associated with the outcome. Participants reporting good health status had higher odds compared with those reporting not good health (aOR = 1.78, 95% CI: 1.30–2.45). Exposure to adverse life events was consistently

associated with poor sleep quality. Students who experienced the loss of a relative or friend (aOR = 1.52, 95% CI: 1.08–2.14, p = 0.016), family problems (aOR = 1.91, 95% CI: 1.32–2.77, p < 0.001), and serious illness (aOR = 2.01, 95% CI: 1.01–4.00, p = 0.047) had significantly higher odds of poor sleep compared with those reporting no such events. Bullying or abuse demonstrated the strongest association, with nearly a fivefold increase in the odds of poor sleep quality (aOR = 4.86, 95% CI: 2.60–9.08, p < 0.001). Regarding behavioural factors, coffee consumption (aOR = 1.61, 95% CI: 1.15–2.27, p = 0.005) and smoking (aOR = 3.94, 95% CI: 1.02–15.25, p = 0.047) were significantly associated with poor sleep quality, whereas alcohol use was not statistically significant after adjustment (p = 0.112). Family functioning was also an important correlate. Compared with students reporting good family cohesion, those with poor bonding (aOR = 1.96, 95% CI: 1.38–2.78, p < 0.001) and no bonding (aOR = 3.21, 95% CI: 1.20–8.57, p = 0.020) had substantially higher odds of poor sleep quality. Conversely, some parental occupational characteristics appeared to be protective. Having a father working as a worker (aOR = 0.58, 95% CI: 0.35–0.96, p = 0.034) or a mother working as a farmer (aOR = 0.62, 95% CI: 0.40–0.96, p = 0.031) was associated with lower odds of poor sleep quality compared with civil servant occupations. Finally, students receiving financial support from both family and other sources had marginally higher odds of poor sleep quality than those fully supported by parents (aOR = 1.32, 95% CI: 1.00–1.74, p = 0.049). Overall, the findings indicate that psychosocial stressors and family-related factors play a prominent role, independent of lifestyle and socioeconomic characteristics.

4. DISCUSSION

Sleep quality characteristics of the study participants

The mental health status and sleep quality of medical students are emerging as an urgent public health challenge. Our study found that 44.09% of students in Preventive Medicine and Traditional Medicine programs experienced poor sleep quality. This figure not only reflects the unique academic pressures they face but also highlights a critical gap in health care and support for the future healthcare workforce.

The prevalence observed in this study was lower than that reported in previous studies conducted in Latin America (62.2%), Saudi Arabia (63.2%), China (74.33%), and Brazil (80.95%) [6 7 8 9]. However, these findings are consistent with those reported in recent studies conducted in Vietnam [10 11 12] and in other Asian countries [13 14]. These differences may be partly explained by the fact that some previous studies were conducted during the COVID-19 pandemic, which may have adversely affected students' sleep quality. In addition, variations in sample size, sampling techniques, study design, and study populations could also have contributed to the observed discrepancies. Conversely, a meta-analysis among Chinese students reported that medical students were more likely to experience sleep disturbances than their non-medical counterparts [15]. This difference may be explained by the heavier academic workload faced by medical students, who are required to assimilate a large volume of knowledge, engage in more intensive training activities, and endure higher levels of stress, all of which may contribute to poorer sleep quality. Although this prevalence is broadly comparable to findings from recent studies conducted in Vietnam, a study undertaken in 2019–2020 reported that only 36.6% of Vietnamese medical students

experienced poor sleep quality [16]. The escalating prevalence of poor sleep quality among medical students likely reflects the cumulative impact of systemic stressors. The unique academic rigor of medical education, characterized by an exhaustive curriculum and intensive clinical training, induces substantial psychophysical overload, frequently at the expense of restorative rest. Concurrently, the pervasive use of digital technology exacerbates this issue; nocturnal exposure to short-wavelength (blue) light from electronic devices disrupts circadian homeostasis, thereby perpetuating a state of chronic sleep insufficiency [17]. The enduring sequelae of lifestyle shifts in the post COVID 19 era represent a critical determinant of contemporary sleep patterns. Latent psychological trauma and the profound disruption of sociobehavioral routines established during periods of mandatory isolation continue to exert a lingering impact on mental health. These factors frequently precipitate a pathological cycle where chronic anxiety and insomnia reinforce each other, creating a bidirectional burden that remains difficult to resolve. When these elements converge with intense academic demands and digital interference, they manifest as a multifaceted crisis of deteriorating sleep health within the medical student population.

In the multivariable logistic regression analysis, several factors remained independently associated with poor sleep quality among students. Students who reported good self-rated health had higher odds of sleep problems compared with those reporting poor healthThis unexpected association may be explained by the fact that self-rated good health among students often reflects physical condition rather than psychological wellbeing. Students who perceive themselves as healthy may participate more intensively in academic, social, and extracurricular activities, leading to irregular sleep schedules and sleep restriction. Evidence from university-based studies indicates that high academic demands, prolonged screen exposure, and active social engagement are consistently linked to poorer sleep quality despite favourable self-perceived health status [18]. Recent studies highlight a complex interplay where lifestyle demands and stress levels act as critical intermediaries between subjective health perceptions and sleep outcomes in the youth demographic [19]. Consequently, relying solely on self-rated health may lead to an underestimation of sleep disturbance risks. A more robust predictive model requires the concurrent evaluation of psychosocial stressors and behavioral patterns to capture the latent vulnerabilities in this population.

The study identifies a significant association between exposure to adverse life events and diminished sleep quality among students. Specifically, family problems and serious illness emerged as the strongest predictors, doubling the odds of poor sleep outcomes (aOR = 1.91 and 2.01, respectively). The impact of losing a loved one or friend (aOR = 1.52, p = 0.016) further corroborates that acute psychosocial disruptions are critical associated with sleep disturbances in this demographic. These findings suggest that the emotional burden associated with domestic instability and health crises may trigger physiological hyperarousal, thereby impairing sleep-wake regulation [20]. Consequently, clinical screening for sleep disorders in young adults should prioritize individuals reporting recent life-event stressors to ensure targeted mental health support [21].

Interpersonal trauma, particularly bullying and abuse, emerged as the most powerful determinant of sleep deterioration in this population, suggesting that such profound psychosocial stressors induce a state of chronic physiological arousal that far outweighs lifestyle influences [22]. Among behavioral factors, the substantial impact of smoking and caffeine consumption underscores the role of exogenous stimulants in disrupting the neurobiological regulation of the sleep-wake cycle [23 24]. Notably, the loss of statistical significance for alcohol use after adjustment suggests that its effect may be secondary to more dominant variables, such as family dysfunction. These findings indicate that family dynamics serve as a fundamental environmental pillar for sleep health. Consequently, effective interventions must move beyond generic advice, prioritizing trauma-informed support and targeted counseling for substance use to address the primary drivers of sleep disturbances in young adults [25].

Our results demonstrate a clear risk gradient where diminishing family cohesion significantly escalates the likelihood of sleep deterioration. This association suggests that a stable and supportive domestic environment serves as a critical emotional buffer; conversely, the absence of cohesion may foster a state of chronic vigilance and nocturnal anxiety, fundamentally disrupting sleep-wake regulation [26]. Furthermore, the protective effect observed with specific parental occupational traits likely reflects the benefits of higher socioeconomic stability and health literacy, which facilitate more structured sleep environments and consistent routines [27]. These findings underscore that sleep is a socially embedded process rather than a purely individual biological function. Consequently, clinical interventions should adopt a systemic perspective, integrating family-based support and addressing household socioeconomic associated with effectively mitigate sleep disturbances in young adults [28].

Strengths and limitations

This research possesses several distinct strengths. First, the recruitment of 846 students from diverse medical disciplines provides a robust sample size that enhances the statistical power necessary to identify significant psychosocial and familial predictors of sleep quality. Second, the application of the Pittsburgh Sleep Quality Index, a globally recognized and validated instrument, ensures that our prevalence estimates are comparable with international benchmarks in medical education. Furthermore, by integrating a wide array of variables ranging from interpersonal trauma to parental occupational traits, this study offers a comprehensive perspective on the social associated with sleep health that moves beyond simple behavioral or academic factors.

However, certain limitations must be considered when interpreting these findings. The cross sectional nature of the study design precludes the establishment of definitive causal relationships between the identified stressors and sleep outcomes. Future longitudinal investigations are required to elucidate the temporal direction of these associations. The use of convenience sampling may introduce selection bias, as students present during data collection may differ from those absent. Additionally, because data collection relied on self administered questionnaires, the results may be subject to recall bias or social desirability bias, particularly regarding sensitive issues such as bullying, substance use, or family dysfunction. Although the study was conducted at a major medical institution in Ho Chi Minh City, the

findings may not be fully generalizable to medical students in rural regions or those in different healthcare training environments. Finally, while we adjusted for multiple confounding factors, unmeasured variables such as specific clinical rotation schedules or undiagnosed mental health conditions could still influence the observed sleep patterns.

5. CONCLUSION

This study highlights a high prevalence of poor sleep quality among medical students driven by a complex interplay of academic rigor and the enduring sequelae of the post COVID 19 era. Our findings identify interpersonal trauma specifically bullying and abuse alongside family dysfunction as the most potent psychosocial associated with sleep deterioration independent of traditional lifestyle factors. Furthermore the significant impact of smoking and caffeine consumption underscores the role of exogenous stimulants in disrupting circadian homeostasis. These results suggest that conventional sleep hygiene education is insufficient. Instead university health services must prioritize trauma informed mental health screenings and systemic interventions that address the domestic and financial stressors of the student population. Strengthening family cohesion and providing targeted psychological support for those experiencing adverse life events are essential strategies to mitigate the multifaceted crisis of sleep deprivation in future healthcare professionals.

Abbreviations

aOR
Adjusted Odds Ratio
CI
Confidence Interval
COVID 19
Coronavirus Disease 2019
IQR
Interquartile Range
OR
Odds Ratio
PSQI
Pittsburgh Sleep Quality Index
SD
Standard Deviation
UMP
University of Medicine and Pharmacy at Ho Chi Minh City

Declarations

Ethics approval

This study protocol was reviewed and approved by the Institutional Review Board of the University of Medicine and Pharmacy at Ho Chi Minh City (Approval No. 425/ĐHYD-HĐĐĐ, expedited review process, approved on January 22, 2025). An additional related protocol was also approved by the same Ethics Committee (Approval No. 424/ĐHYD-HĐĐĐ, approved on January 22, 2025). The study was conducted in accordance with the Declaration of Helsinki.

All participants were informed about the study objectives and procedures. Written informed consent was obtained from all participants prior to data collection. Participation was voluntary, and confidentiality and anonymity were strictly maintained throughout the study.

Participants reporting distress were provided with information on counseling services.

Consent to participate

All participants were provided with detailed information regarding the study objectives and procedures prior to data collection. Written informed consent was obtained from every student before their participation in the survey. Participation was entirely voluntary and anonymous.

Consent for publication

The informed consent obtained from participants included the use of anonymized data for publication in academic journals. No individual level identifiable information is included in this manuscript.

Availability of data

The datasets generated and analyzed during the current study are not publicly available due to institutional privacy policies regarding student data. However, the data are available from the corresponding author upon reasonable request for research purposes.

Competing interests

The authors declare that they have no competing interests or financial conflicts that could inappropriately influence the integrity of this research.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not for profit sectors.

Authors' contributions

PTP, QTT, and TKNN conceived and designed the study. PTP, DTNN, and NQNP were responsible for data collection and management. CHN and TANN performed the statistical analysis using Stata software. PTP and CHN drafted the initial manuscript. All authors contributed to the interpretation of the results, critically reviewed the manuscript for intellectual content, and approved the final version for submission

Acknowledgements

The authors would like to express their sincere gratitude to the University of Medicine and Pharmacy at Ho Chi Minh City for providing the institutional support and resources necessary to conduct this research. We are deeply indebted to the faculty members and medical students who participated in this study for their invaluable time and contributions. Special thanks are also extended to the research assistants and administrative staff for their technical assistance in data collection and management. This work represents a collaborative effort to better understand and improve the health outcomes of the future medical workforce.

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Figures

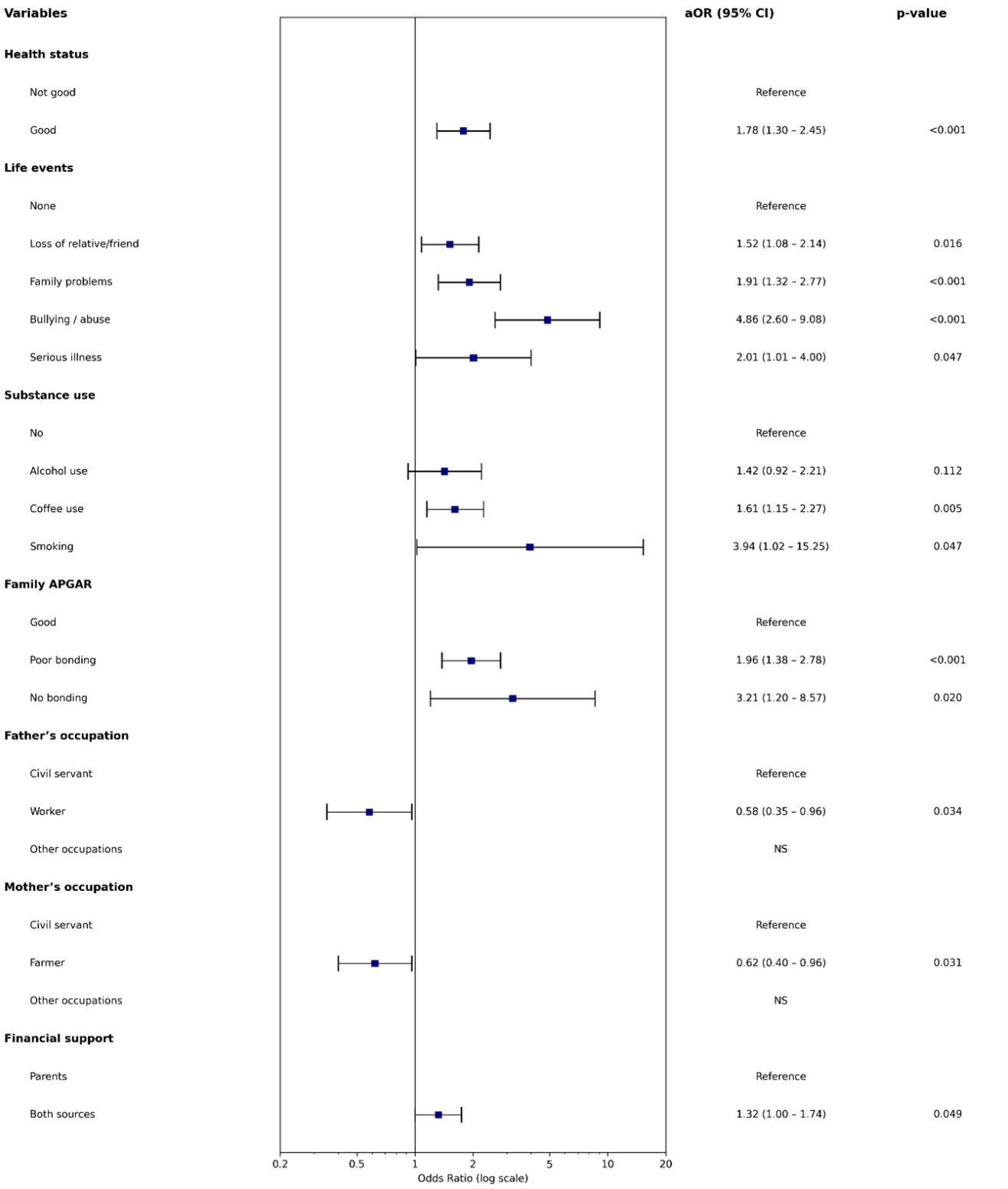


Figure 1

Forest plot of psychosocial, family, and behavioral factors independently associated with the outcome in multivariable logistic regression.