Original article

Sleep quality and associated factors among nursing students at Hue University of Medicine and Pharmacy

Chau Thi Minh Huyen, Pham Thi Thuy Nga, Do Thi Mai Hoa, Nguyen Hoang Hai, Nguyen Thi Phuong Chi, Nguyen Phuc Nhat Giang, Dao Nguyen Dieu Trang*

Hue University of Medicine and Pharmacy, Hue University

***Corresponding author:** Dao Nguyen Dieu Trang; email: dndtrang@huemed-univ.edu.vn
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Abstract

Background: Poor sleep quality is a common problem among university students and may affect their health and academic performance. Nursing students may be at higher risk of experiencing sleep-related problems due to the nature of their training, which combines theoretical learning with clinical practice. Assessing sleep quality and its associated factors among nursing students may provide a basis for developing interventions to improve their health and academic performance.

Objectives: To describe sleep quality and identify factors associated with sleep quality among nursing students.

Materials and methods: A cross-sectional analytical study was conducted among 690 nursing students at Hue University of Medicine and Pharmacy. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while academic stress was assessed using the Educational Stress Scale for Adolescents (ESSA). Data were analyzed using descriptive statistics and multivariable logistic regression, with statistical significance set at $p < 0.05$.

Results: Poor sleep quality was reported by 61.2% of the students, while 38.8% had good sleep quality. The mean sleep duration was 6.20 ± 1.44 hours per night, with 80.4% of students sleeping less than 7 hours per night. ESSA scores were higher among students with poor sleep quality than among those with good sleep quality, with median scores of 40.0 (34.0 – 45.0) and 35.5 (29.0 – 41.0), respectively; the difference was statistically significant ($p < 0.001$). Multivariable logistic regression showed that academic stress was significantly associated with sleep quality (AOR = 1.058; 95% CI: 1.039 – 1.077; $p < 0.001$).

Conclusion: Poor sleep quality is an issue of concern among nursing students. Academic stress was significantly associated with sleep quality.

Keywords: *sleep quality; PSQI; academic stress; ESSA; nursing students.*

1. INTRODUCTION

Sleep is an essential physiological need that plays an important role in physical and mental health as well as cognitive functioning. Sleep quality encompasses various aspects, including sleep duration, sleep efficiency, sleep maintenance, and daytime alertness. Among university students, inadequate sleep may be associated with impaired concentration and memory, as well as poorer academic performance [1, 2].

Students in health-related disciplines are often required to meet the demands of both theoretical learning and practical training, and poor sleep quality is relatively common in this group [3]. For nursing students, combining academic learning with clinical practice, along with examination and assessment-related pressures, may disrupt their rest schedules and adversely affect sleep quality. Academic stress is also an important factor because nursing students face multiple academic demands throughout their training. Previous studies have reported an association between academic stress and sleep quality [4, 5]. Therefore, examining academic stress may help clarify factors associated with sleep quality among nursing students.

In Vietnam, a study by Ngo Thi Huyen (2022) among nursing students at Dai Nam University found that 55.5% of students had poor sleep quality [6]. Similarly, a study by Nguyen Thi Nhu Quynh et al. (2024) at Tay Nguyen University reported that 56.8% of students had a Pittsburgh Sleep Quality Index (PSQI) score > 5, indicating poor sleep quality [7]. At Hue University of Medicine and Pharmacy, Hue University, a previous study assessed sleep quality among first-year students [8]. However, evidence on sleep quality and associated factors among nursing

students across all four years of training remains limited, particularly regarding the association between academic stress and sleep quality. In this context, the present study was conducted to provide additional evidence on sleep quality and associated factors among nursing students at Hue University of Medicine and Pharmacy, Hue University. The study had two objectives:

1. To describe sleep quality among nursing students at Hue University of Medicine and Pharmacy, Hue University.

2. To identify factors associated with sleep quality among nursing students at Hue University of Medicine and Pharmacy, Hue University.

2. PARTICIPANTS AND METHODS

2.1. Study participants

The study participants were full-time undergraduate nursing students in the first to fourth years of study at Hue University of Medicine and Pharmacy, Hue University.

2.1.1. Inclusion criteria

Students who voluntarily agreed to participate in the study and completed the questionnaire in full were eligible for inclusion.

2.1.2. Exclusion criteria

Students who were on academic leave, declined to participate, had severe acute or chronic medical conditions that directly affected sleep, or submitted incomplete or invalid questionnaires were excluded.

2.1.3. Study setting and study period

The study was conducted at Hue University of Medicine and Pharmacy, Hue University, from January to September 2026. Before July 13, 2026, the study focused on literature review and questionnaire development. Data were collected from July 14 to August 5, 2026, after approval by the Institutional Ethics Committee for Biomedical Research.

2.2. Study methods

2.2.1. Study design: An analytical cross-sectional study was conducted.

2.2.2. Sample size and sampling method

- Sample size

The minimum sample size was calculated using the formula for estimating a single population proportion:

$$n = Z^2_{1-\frac{\alpha}{2}} \frac{p(1-p)}{d^2}$$

Where:

n: minimum required sample size

$Z^2_{1-\frac{\alpha}{2}}$=1.96 corresponding to a 95% confidence level.

p = 0.568*:* proportion of students with poor sleep quality, based on the study by Nguyen Thi Nhu Quynh et al. conducted at Tay Nguyen University in 2024 [7].

d = 0.05: allowable margin of error.

The minimum required sample size was 378 students. An additional 10% was added to account for potential non-response or invalid questionnaires, resulting in a required sample size of 420 students.

- Sampling method: A total sampling method was used. Approximately 768 first- to fourth-year nursing students were invited to participate in the study. After data collection and verification of data completeness and validity, 690 students with valid questionnaires were included in the final analysis, corresponding to a response rate of 89.8%. Students who did not participate or had invalid data were excluded from the analysis.

2.2.3. Data collection procedure

Data were collected using face-to-face and online methods. Students present at the university completed the questionnaire in class, while absent students received the survey link through class representatives. Both methods used the same questionnaire and procedures. The online survey required a university email account to help identify duplicate responses. Students were instructed to respond only once and not to complete the online survey if they had already responded face-to-face. Of 690 valid questionnaires, 649 (94.1%) were collected face-to-face and 41 (5.9%) online.

2.3. Data collection methods

Data were collected using a questionnaire consisting of three sections: participants' general characteristics, the Pittsburgh Sleep Quality Index (PSQI), and the Educational Stress Scale for Adolescents (ESSA). The PSQI assesses sleep quality over the past month and consists of 19 questions grouped into seven components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The total PSQI score ranges from 0 to 21, with higher scores indicating poorer sleep quality; a PSQI score ≤ 5 indicates good sleep quality, while a score > 5 indicates poor sleep quality [9]. The ESSA consists of 16 questions covering five components: pressure from study, workload, worry about grades, self-expectation, and despondency [10]. Although originally developed for adolescents, the ESSA was used because its content is relevant to aspects of academic stress among nursing students in a training environment combining theoretical learning, practical training, and clinical practice. Each item is scored from 1 – 5, with a total score

ranging from 16 – 80; higher scores indicate greater academic stress. In this study, the ESSA was treated as a continuous variable, and no cut-off point was applied. The internal consistency of the scales was assessed using Cronbach's alpha based on data from 690 students. Cronbach's alpha was 0.572 for the seven-component PSQI and 0.878 for the ESSA. The Vietnamese version of the PSQI had a Cronbach's alpha coefficient of 0.789 [10], while the Vietnamese version of the ESSA demonstrated a Cronbach's alpha coefficient of 0.83 [11].

Data were collected using a self-administered questionnaire, either in person or online. Before participation, students were provided with information about the study objectives, content, voluntary participation, and confidentiality of their information. After completion, all questionnaires were checked for completeness and validity before data entry and statistical analysis.

2.4. Data processing and statistical analysis

Data were entered using Microsoft Excel and analyzed using SPSS version 20.0.

The Chi-square test/Fisher's exact test, independent-samples t-test/Mann–Whitney U test, and ANOVA/Kruskal–Wallis test were used to assess the associations between sleep quality and the characteristics of the study participants. Statistical significance was set at $p < 0.05$, with a 95% CI.

Binary logistic regression was used to identify factors associated with sleep quality. The results were presented as adjusted odds ratios (AORs), 95% CI, and *p*-values.

2.5. Ethical considerations

The study was conducted to ensure the rights and well-being of the participating students. Students had the right to refuse or withdraw from the study at any time without affecting their academic rights or benefits. All collected information was kept confidential and used solely for research purposes. The study was approved by the Ethics Committee in Biomedical Research of Hue University of Medicine and Pharmacy, with decision No. H2026/921 dated July 13, 2026.

3. RESULTS

3.1. General characteristics of the study participants

Table 1. General characteristics of the study participants (n = 690)

Characteristics		Frequency (n)	Percentage (%)
Sex	Male	74	10.7
	Female	616	89.3
Current residence	Living with family	236	34.2
	Living in a dormitory	30	4.3
	Renting with friends	257	37.2
	Living alone	167	24.2
Place of residence	Urban	401	58.1
	Rural	289	41.9
Living arrangement	Family	322	46.7
	Friends	156	22.6
	Alone	212	30.7
Year of study	First year	141	20.4
	Second year	269	39.0
	Third year	171	24.8
	Fourth year	109	15.8
Mode of study	Theoretical	318	46.1
	Clinical	18	2.6
	Combined	354	51.3

Academic performance	Excellent	8	1.2
	Very good	89	12.9
	Good	303	43.9
	Average	252	36.5
	Poor	38	5.5
Part-time employment	Yes	251	36.4
	No	439	63.6

Among the 690 students, females accounted for a higher proportion than males (89.3% vs. 10.7%). Students living with friends accounted for the highest proportion (37.2%), while those living in dormitories accounted for the lowest (4.3%). More than half of the students (58.1%) lived in urban areas. Regarding year of study, second-year students accounted for the highest proportion (39.0%). The predominant mode of study was a combination of theoretical and clinical learning (51.3%). In terms of academic performance, students with good performance accounted for the highest proportion (43.9%), followed by those with average performance (36.5%). Many students did not have a part-time job (63.6%).

3.2. Sleep quality among nursing students

Table 2. Sleep quality by component: sleep duration, sleep latency, and habitual sleep efficiency (n = 690)

Characteristics		Frequency (n)	Percentage (%)
Sleep duration	< 5 hours	94	13.6
	5 – < 6 hours	142	20.6
	6 – < 7 hours	319	46.2
	≥ 7 hours	135	19.6
	Mean ± SD; (Min–Max): 6.20 ± 1.44; (1.5 – 12.0)		
Sleep latency	≤ 15 minutes	343	49.7
	16 – 30 minutes	251	36.4
	31 – 60 minutes	77	11.2
	> 60 minutes	19	2.8
Habitual sleep efficiency	< 65%	13	1.9
	65 – 74%	35	5.1
	75 – 84%	106	15.4
	≥ 85%	536	77.7

The mean sleep duration among the students was 6.20 ± 1.44 hours, ranging from 1.5 to 12.0 hours. The largest proportion of students (46.2%) reported sleeping 6 to < 7 hours per night. Nearly half of the students (49.7%) had a sleep latency of ≤ 15 minutes. Most students (77.7%) had a habitual sleep efficiency of ≥ 85%.

Table 3. Sleep quality by component: use of sleep medication, daytime dysfunction, and subjective sleep quality (n = 690)

Characteristics	Not during the past month, n (%)	Less than once a week, n (%)	Once or twice a week, n (%)	Three or more times a week, n (%)
Use of sleep medication	646 (93.6)	26 (3.8)	11 (1.6)	7 (1.0)
Difficulty maintaining alertness	369 (53.5)	170 (24.6)	120 (17.4)	31 (4.5)
Difficulty maintaining enthusiasm	171 (24.8)	313 (45.4)	169 (24.5)	37 (5.4)

Subjective sleep quality	Very good, n (%)	Fairly good, n (%)	Fairly bad, n (%)	Very bad, n (%)
	116 (16.8)	375 (54.3)	178 (25.8)	21 (3.0)

Most students had not used sleep medication during the past month (93.6%). More than half of the students reported no difficulty maintaining alertness (53.5%). Regarding difficulty maintaining enthusiasm, the highest proportion of students reported experiencing it less than once a week (45.4%). For subjective sleep quality, 54.3% of students rated their sleep quality as fairly good.

Table 4. Sleep quality by component: Sleep disturbances (n = 690)

Characteristics	Not during the past month, n (%)	Less than once a week, n (%)	Once or twice a week, n (%)	Three or more times a week, n (%)
Cannot fall asleep within 30 minutes	178 (25.8)	205 (29.7)	177 (25.7)	130 (18.8)
Wake up in the middle of the night or early morning	204 (29.6)	216 (31.3)	167 (24.2)	103 (14.9)
Must get up to use the bathroom	305 (44.2)	207 (30.0)	123 (17.8)	55 (8.0)
Having trouble breathing	527 (76.4)	106 (15.4)	37 (5.4)	20 (2.9)
Cough or snore loudly	535 (77.5)	93 (13.5)	45 (6.5)	17 (2.5)
Feel too cold	420 (60.9)	170 (24.6)	84 (12.2)	16 (2.3)
Feel too hot	209 (30.3)	145 (21.0)	177 (25.7)	159 (23.0)
Have bad dreams	361 (52.3)	192 (27.8)	86 (12.5)	51 (7.4)
Have pain	447 (64.8)	160 (23.2)	66 (9.6)	17 (2.5)

The most common sleep disturbances were difficulty falling asleep within 30 minutes (74.2%) and waking up in the middle of the night or early morning (70.4%). Feeling too hot was also relatively common (69.7%). In contrast, having trouble breathing (23.7%) and coughing or snoring loudly (22.5%) were less frequently reported.

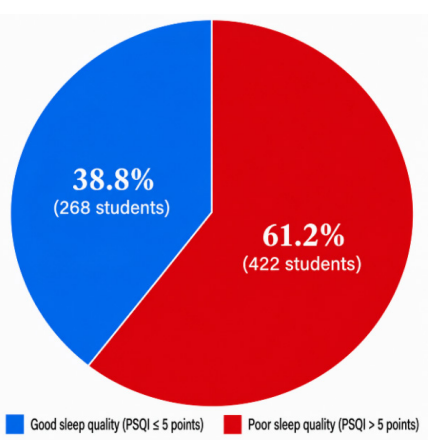


Figure 1. Classification of sleep quality among nursing students (n = 690)

Among the 690 students, 422 (61.2%) had poor sleep quality, while 268 (38.8%) had good sleep quality, indicating that poor sleep quality was relatively common among nursing students.

3.3. Factors associated with sleep quality among nursing students

Table 5. Association between participants' general characteristics and sleep quality (n = 690)

Characteristics		Good sleep quality, n (%)	Poor sleep quality, n (%)	p
Sex	Male	37 (50.0)	37 (50.0)	**0.037***
	Female	231 (37.5)	385 (62.5)	
Current residence	Living with family	99 (41.9)	137 (58.1)	0.636
	Living in a dormitory	12 (40.0)	18 (60.0)	
	Renting with friends	97 (37.7)	160 (62.3)	
	Living alone	60 (35.9)	107 (64.1)	
Place of residence	Urban	165 (41.1)	236 (58.9)	0.143
	Rural	103 (35.6)	186 (64.4)	
Living arrangement	Family	134 (41.6)	188 (58.4)	0.313
	Friends	54 (34.6)	102 (65.4)	
	Alone	80 (37.7)	132 (62.3)	
Year of study	First year	52 (36.9)	89 (63.1)	0.711
	Second year	100 (37.2)	169 (62.8)	
	Third year	70 (40.9)	101 (59.1)	
	Fourth year	46 (42.2)	63 (57.8)	
Mode of study	Theoretical	121 (38.1)	197 (61.9)	0.281
	Clinical	4 (22.2)	14 (77.8)	
	Combined	143 (40.4)	211 (59.6)	
Academic performance	Excellent	3 (37.5)	5 (62.5)	0.160
	Very good	32 (36.0)	57 (64.0)	
	Good	127 (41.9)	176 (58.1)	
	Average	98 (38.9)	154 (61.1)	
	Poor	8 (21.1)	30 (78.9)	
Part-time employment	Yes	88 (35.1)	163 (64.9)	0.123
	No	180 (41.0)	259 (59.0)	

** Note: p: p-value of Pearson's Chi-square test.*

The prevalence of poor sleep quality was higher among females than males (62.5% vs. 50.0%), with a statistically significant difference ($p = 0.037$). No statistically significant associations were observed between the other characteristics and sleep quality ($p > 0.05$).

Table 6. Association between academic stress and sleep quality among nursing students (n = 690)

Sleep quality	n	ESSA, Median (Q1–Q3)	Mean Rank	p
Good sleep quality	268	35.5 (29.0 – 41.0)	282.66	
Poor sleep quality	422	40.0 (34.0 – 45.0)	385.41	
Mann–Whitney U = 39,706.5; Z = –6.605				< 0.001

The academic stress score (ESSA) was higher among students with poor sleep quality than among those with good sleep quality, with median scores of 40.0 (34.0 – 45.0) and 35.5 (29.0 – 41.0), respectively. The Mann–Whitney U test showed a statistically significant difference between the two groups (U = 39,706.5; Z = −6.605; $p < 0.001$).

3.4. Multivariable logistic regression

Table 7. Multivariable logistic regression of factors associated with sleep quality among nursing students (n = 690)

Factors		B	SE	Wald	AOR	95% CI	p
Sex	Female	–	–	–	1.000	–	–
	Male	–0.356	0.257	1.918	0.701	0.424–1.159	0.166
ESSA Total		0.056	0.009	36.506	1.058	1.039–1.077	**< 0.001**

N = 690; −2 Log likelihood = 877.486; Cox & Snell R^2 = 0.062; Nagelkerke R^2 = 0.085; Hosmer–Lemeshow test: χ^2 = 4.502, df = 7, p = 0.720.

** Note: The reference group was assigned an adjusted OR of 1.000. B: regression coefficient; SE: standard error; AOR: adjusted odds ratio; 95% CI: 95% confidence interval; p: p-value.*

The results of the multivariable logistic regression analysis showed that the academic stress score (ESSA Total) was significantly associated with sleep quality after adjustment for sex (AOR = 1.058; 95% CI: 1.039 – 1.077; $p < 0.001$). Each one-point increase in the ESSA score was associated with a 5.8% increase in the odds of poor sleep quality.

Regarding sex, compared with females, male students had lower odds of having poor sleep quality (AOR = 0.701; 95% CI: 0.424 – 1.159); however, the difference was not statistically significant ($p = 0.166$).

The model had a −2 Log likelihood of 877.486, a Cox & Snell R^2 of 0.062, and a Nagelkerke R^2 of 0.085. The Hosmer–Lemeshow test yielded $\chi^2 = 4.502$, df = 7, and $p = 0.720$ (> 0.05), indicating no evidence of lack of fit between the model and the observed data.

4. DISCUSSION

4.1. Sleep quality among nursing students

In this study, 61.2% of the students had poor sleep quality according to the PSQI, similar to findings by Nguyen Thi Nhu Quynh et al. (56.8%) [7] and Ngo Thi Huyen (55.5%) [6]. Other studies reported different proportions, including Doan Minh Nhut et al. among students majoring in Anesthesia and Critical Care Nursing (82.7%) [12] and Ghosh et al. in India (82.42%) [13]. Differences may reflect variations in study populations, methods, instruments, cut-off points, and data collection periods. The proportion observed in the present study may be associated with the combined demands of academic learning, examinations, and clinical practice, which may disrupt sleep schedules and limit rest.

Sleep duration of less than 7 hours per night was common, with 80.4% of students reporting this sleep duration. This proportion was below the 7–9 hours of sleep per night recommended for adults by the American Academy of Sleep Medicine (AASM) [14]. Academic and clinical demands may limit nursing students' time available for rest. Insufficient sleep may affect daytime alertness, concentration, and cognitive functioning, which are important for both academic learning and clinical practice.

Difficulty falling asleep within 30 minutes (74.2%) and waking during the night or early morning (70.4%) were also common. Academic demands and stress may contribute to these difficulties by making it harder to relax at bedtime or maintain regular sleep patterns.

Notably, although 61.2% of students were classified as having poor sleep quality according to the PSQI, 71.1% rated their sleep as "fairly good" or "very good". This discrepancy may reflect the multidimensional nature of the PSQI, which assesses multiple aspects of sleep. Students may therefore perceive their overall sleep as satisfactory despite specific sleep difficulties. Thus, the findings are not necessarily contradictory but may reflect differences between subjective and multidimensional assessments. The proportion reporting good sleep quality also differed from that reported by Nisa and Mulyadi (50.4%) [15].

Sleep medication was uncommon, with 93.6% of students reporting no use during the previous month. Sleep problems were mainly related to sleep duration, sleep initiation, and sleep maintenance rather than the use of sleep medication.

4.2. Associations between factors and sleep quality among nursing students

In the univariate analysis, the proportion of students with poor sleep quality was higher among females than males (62.5% vs. 50.0%; $p = 0.037$), which is consistent with findings from several previous studies, including that by Luong Thi Thu Tham et al. [8]. This difference may be related to physiological characteristics and responses to stressors, although the underlying mechanisms were not assessed in

this study. However, in the multivariable model including sex and academic stress, the association between sex and sleep quality was no longer statistically significant (p = 0.166). This suggests that the univariate association may have been influenced by factors included in the model, including academic stress. Other factors, including place of residence, living arrangements, year of study, mode of learning, academic performance, and part-time employment, were not significantly associated with sleep quality (p = 0.05). Sleep quality may also be influenced by individual routines, coping strategies, workload, and other unmeasured factors.

The findings showed that academic stress was significantly associated with sleep quality. ESSA scores were higher among students with poor sleep quality than among those with good sleep quality (p < 0.001), consistent with a study by Dewi et al. among nursing students in Indonesia (p = 0.01) [4]. Similarly, Tari et al. reported a positive correlation between academic stress and PSQI scores (r = 0.236; p = 0.002) [5]. For nursing students, the combined demands of a substantial theoretical workload, examinations, and clinical practice may increase academic demands and affect their time for rest. Academic stress may disrupt relaxation and bedtime routines, making it harder to initiate or maintain sleep. Conversely, poor sleep may impair concentration and daytime functioning, potentially increasing academic difficulties and stress.

In the multivariable logistic regression model, academic stress remained significantly associated with sleep quality (AOR = 1.058; 95% CI: 1.039–1.077; p < 0.001). After adjustment for sex, each one-point increase in the ESSA score was associated with a 5.8% increase in the odds of poor sleep quality among students. These findings may provide a basis for supportive interventions to promote better sleep health among nursing students. Interventions addressing academic stress may be worth evaluating as a potential approach to improving sleep, although longitudinal or interventional studies are needed to establish causality

4.3. Study limitations

The cross-sectional design precludes the determination of causal relationships and does not rule out the possibility that poor sleep quality may affect students' perceptions and levels of academic stress. Data were collected through both direct and online methods, which may have introduced response bias due to differences in the circumstances of responding; PSQI and ESSA scores were not compared between the two methods. Some factors, including electronic device use, caffeine consumption, physical activity, mental health, clinical practice duration, and academic workload, were not assessed and may have resulted in uncontrolled confounding. In addition, the PSQI demonstrated relatively low internal consistency in the present sample (Cronbach's alpha = 0.572). Because the seven PSQI components assess distinct dimensions of sleep quality rather than interchangeable indicators of a single latent construct, Cronbach's alpha may not be an optimal indicator of the internal consistency of the PSQI global score. Therefore, the observed alpha of 0.572 was interpreted cautiously.

5. CONCLUSION

Poor sleep quality was common among nursing students, with 61.2% of students classified as having poor sleep quality according to the PSQI.

Academic stress was significantly associated with sleep quality, whereas no statistically significant associations were found for the other factors assessed.

Conflict of interest statement: The authors declare that they have no conflicts of interest related to the study, authorship, or publication of this article.

6. RECOMMENDATIONS

The university and the Faculty of Nursing should arrange academic, examination, and clinical practice schedules, avoiding examinations immediately after night shifts. Psychological support and training in time management, academic stress management, and sleep hygiene should be provided, particularly from the first year. Students should also be encouraged to plan their studies effectively and maintain healthy sleep habits. Future studies should further evaluate other potential factors, such as electronic device use, caffeine consumption, physical activity, and part-time employment, to better clarify the factors associated with sleep quality.

REFERENCES

1. Buysse DJ. Sleep health: can we define it? Does it matter? Sleep. 2014;37(1):9-17. doi:10.5665/sleep.3298.

2. Suardiaz-Muro M, Morante-Ruiz M, Ortega-Moreno M, Ruiz MA, Martín-Plasencia P, Vela-Bueno A. Sleep and academic performance in university students: a systematic review. Rev Neurol. 2020;71(2):43-53. doi:10.33588/rn.7102.2020015.

3. Almeida MB, Pena KM, Queiroz YS, Cruz YET, Marques MS. The sleep quality of medical students: A systematic review. Res Soc Dev. 2024;13(1):e14513144912. doi:10.33448/rsd-v13i1.44912.

4. Dewi A, Wiratmo PA, Mussyarifah RF, Pamungkas

IG. Academic stress of final-year students of the nursing study program: a cross-sectional study with their sleep quality. Klabat J Nurs. 2024;6(2):33-38. doi:10.37771/kjn.v6i2.1172.

5. Tari MATS, Kamayani MOA, Damayanti MR. Hubungan stres akademik dengan kualitas tidur pada mahasiswa keperawatan Universitas Udayana. Coping: Community of Publishing in Nursing. 2022;10(2):173-179. doi:10.24843/coping.2022.v10.i02.p08.

6. Ngo TH. Sleep quality of nursing students at Dai Nam University and related factors. VMJ. 2022;516(2):94-99. doi:10.51298/vmj.v516i2.3049.

7. Nguyen TNQ, Tran TT, Vu TTH. Sleep quality of nursing students at Tay Nguyen University. JNS. 2024;7(4):77-86. doi:10.54436/jns.2024.04.850.

8. Luong TTT, Le DD, Chau ND, Nguyen NBK, Pham TTH, Ho UP, et al. Survey on sleep quality of first-year students at University of Medicine and Pharmacy, Hue University. Journal of Public Health. 2023;64:6-15.

9. Buysse DJ, Reynolds CF III, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Research. 1989;28(2):193–213. doi:10.1016/0165-1781(89)90047-4.

10. To NM, Nguyen DN, Phung KL, Nguyen XBH, Tran TXL. The Vietnamese version of Pittsburgh Sleep Quality Index. Ho Chi Minh City Journal of Medicine. 2014;18(6):664-668.

11. Thai TT, Kim XL, Nguyen DN, Dixon J, Sun J, Dunne MP. Validation of the Educational Stress Scale for Adolescents (ESSA) in Vietnam. Asia Pac J Public Health. 2015;27(2):NP2112-NP2121. doi:10.1177/1010539512440818.

12. Doan MN, Duong MD. Sleep disorders in nurse anesthesia students at University of Medicine and Pharmacy at Ho Chi Minh City. Pham Ngoc Thach Journal of Medicine and Pharmacy. 2025;4(4):22-30. doi:10.59715/pntjmp.4.4.3.

13. Ghosh T, Sarkar D, Sarkar K, Dalai CK, Ghosal A. A study on smartphone addiction and its effects on sleep quality among nursing students in a municipality town of West Bengal. J Family Med Prim Care. 2021;10(1):378-386. doi:10.4103/jfmpc.jfmpc_1657_20.

14. Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Buysse D, et al. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. J Clin Sleep Med. 2015;11(6):591-592. doi:10.5664/jcsm.4758.

15. Nisa K, Mulyadi M. Differences in sleep quality among nursing students. Nursing Current: Jurnal Keperawatan. 2023;11(2):133-143. doi:10.19166/nc.v11i2.7504.