SMARTPHONE ADDICTION OF HANOI MEDICAL UNIVERSITY, THANH HOA CAMPUS IN 2024: A CROSS-SECTIONAL STUDY ON NURSING STUDENTS

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Smartphone addiction significantly impacts mental health and sleep quality, especially among students. This study examined the prevalence of smartphone addiction and sleep quality among 240 nursing students at Hanoi Medical University - Thanh Hoa Campus and identified related factors. A cross-sectional study was conducted using a self-administered questionnaire, including demographic data, the Smartphone Addiction Scale (SAS-SV), and the Pittsburgh Sleep Quality Index (PSQI). Logistic regression was used to analyze the relationships. Results showed that 64.2% of students met the criteria for smartphone addiction, and 55.4% had poor sleep quality. Students with poor sleep were 2.42 times more likely to be addicted to smartphones than those with good sleep quality (p < 0.05). However, other factors such as gender, year of study, residence, alcohol consumption, caffeine consumption, and club participation were not significantly associated with smartphone addiction among students (p > 0,05). These findings highlight the need to raise awareness and develop strategies to improve mental health and reduce smartphone addiction among nursing students.

Keywords: Smartphone addiction, sleep quality, nursing students.

I. INTRODUCTION

In the context of rapidly developing technology, smartphones have become an indispensable part of daily life, bringing many conveniences and practical value to users. According to statistics from 2023, there are about 6.7 billion smartphones globally and 124 million mobile subscribers in Vietnam.[1,2] However, excessive use of smartphones can lead to serious consequences. Smartphone addiction may result in deteriorated health due to reduced physical activity and changes in daily habits.[3] This also increases the risk of mental disorders such as depression, anxiety and, notably, sleep disorders.[4,5]

In recent years, researchers and clinicians have proposed a new behavioral addiction to smartphones.[6] Smartphone addiction includes four criteria: obsession with using smartphones, increased usage in terms of time and intensity, withdrawal symptoms, and negative impacts on daily activities and social relationships.[7]

Research shows that smartphone addiction among nursing students is rising and negatively impacts sleep quality. In India, smartphone addiction rates among nursing students were 33.33% for female and 46.15% for male while a 2017 study in Vietnam reported 43.7%.[8,9] Sleep quality in medical students is often negatively affected, with 57% of medical students reporting poor sleep quality. In addition, a study by Huynh Ngoc Van Anh et al. also showed that smartphone addiction reduces sleep quality.[10,11]

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Smartphone addiction significantly affects sleep quality. Nighttime screen exposure suppresses melatonin, disrupts circadian rhythms, and delays sleep onset. Moreover, excessive use before bed increases psychological stimulation and shortens sleep duration, leading to poor sleep among students with higher smartphone use.[12]

However, research on smartphone addiction and sleep quality among medical students, especially nursing students, remains limited in Vietnam. To contribute to scientific knowledge and clinical practice, the research team conducted the study: "Current status of smartphone addiction and sleep quality of nursing students at Hanoi Medical University - Thanh Hoa Campus in 2024," with two purposes: 1) To identify the prevalence of smartphone addiction among nursing students at Hanoi Medical University - Thanh Hoa Campus in 2024; 2) To identify factors related to smartphone addiction among nursing students at Hanoi Medical University - Thanh Hoa Campus.

II. MATERIALS AND METHODS

1. Subjects

First-year to fourth-year nursing students at Hanoi Medical University - Thanh Hoa Campus.

Inclusion criteria

- Students agreed to participate in the study.
- Students have used smartphones within the past 3 months.

Exclusion criteria

- Students who have health problems are unable to participate in research.
- Students were not present at the time the researcher went to class to collect information.

2. Methods

Study design: A cross-sectional study.

Location and time

Location: Hanoi Medical University - Thanh Hoa Campus, Dong Ve ward, Thanh Hoa city.

Data collection period: From January 10, 2024 to January 30, 2024.

Time: From November 2023 to May 2024.

Sample size and sampling

Sample size: Total sample size. The total number of first-year to fourth-year nursing students at Hanoi Medical University - Thanh Hoa Campus.

Sampling method: The sampling method was purposive sampling, in which all qualified nursing students were included in the study.

A total of 240 nursing students were recruited for the study. The response rate was 240/253, equivalent to 96.9%.

Variables

Demographic characteristics: age, gender, year of study, retaking course/Grade improvement, participant in clubs, living with someone, part-time, relationship, alcohol consumption, and caffeine consumption.

Sleep quality: Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). The PSQI contains 19 self-rated questionnaires combining to 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each component is scored from 0-3 points, yielding a global score ranging from 0 to 21. Higher scores indicate poorer sleep quality, with a global score > 5 commonly used as the cut-off for poor sleep.[13]

Smartphone addiction: Smartphone addiction was measured using the Smartphone Addiction Scale-Short Version (SAS-SV), a 10-item validated instrument designed to assess the risk of smartphone addiction among adolescents and young adults. Each item is rated

on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), resulting in a total score between 10 and 60. Higher scores indicate greater level of smartphone addiction. Based on previous validation studies, cut–off values of ≥ 31 for males and ≥ 33 for females were applied to classify participants as being at risk of smartphone addiction.[14]

Data collection and analysis

The data was collected through a self-administered questionnaire. The researcher collected data based on the inclusion and exclusion criteria. Before each interview, the researcher introduced the purpose of the study, the research subjects, and how to answer the information in the questionnaire. The questionaire comprised three sections:

Section A: Demographic characteristics of participants.

Section B: Pittsburgh Sleep Quality Index.

Section C: Smartphone Addiction Scale – Short Version.

After data collection, all responses were entered into SPSS version 20.0 for cleaning, descriptive analysis, and further statistical testing. Descriptive statistics were used to summarize the data: frequencies and percentages were reported for categorical variables, while means and standard deviations were calculated for continuous variables with approximately normal distribution.

A multivariable logistic regression model was applied to identify factors witth smartphone addiction, including age, gender, year of study, retaking course/grade improvement, participant in clubs, living with someone, part-time, relationship, alcohol consumption, caffein consumption and sleep quality. Results were presented as odds ratio (OR) with 95% confidence intervals (CI). Prior to inclusion in the multivariable model, all independent variables were tested for multicollinearity.

3. Research ethics

All study participants got detailed information about the goals and content of the research upon their participation. Data was collected anonymously. No sensitive question was included in the questionnaire. The data gathered from the subjects are kept confidential and are solely used for research purposes. The study was approved by the Scientific Committee for students of Hanoi Medical University on June 12, 2024.

III. RESULTS

Characteristics of the subjects

Table 1. Demographic characteristics (n = 240)

Characteristics		n	%
Age		19.75 ± 1.22	
Gender	Male	31	12.9
	Female	209	87.1
Years of study	Year 1	55	22.9
	Year 2	57	23.8
	Year 3	66	27.5
	Year 4	62	25.8

Characteristics		n	%
Retaking course/ Grade improvement	Yes	25	10.4
	No	215	89.6
Participant in clubs	Yes	100	41.7
	No	138	57.5
Living with	Parents	41	17.1
	Relatives	15	6.3
	Friends	143	59.6
	Alone	41	17.1
Part-time	Yes	47	19.6
	No	193	80.4
Relationship	Alone	161	67.1
	Dating	79	32.9
Alcohol consumption	Never	111	46.3
	Sometimes	122	50.8
	Usually	6	2.5
	Always	1	0.4
Caffeine consumption	Never	82	34.2
	Sometimes	136	56.7
	Usually	18	7.5
	Always	4	1.7

There were 240 participants, with 209 female students (accounting for 87.1%) and 31 male students (accounting for 12.9%). The participants from four years were nearly equivalent, with the highest participation rate from third-year students at 27.5% and the lowest from first-year students at 22.9%. The percentage of students living with friends was 59.6%, which was higher than the 23.4% living with family/relatives.

The mean PSQI score was 5.15 ± 2.58 points, indicating that the average sleep quality of students was poor. The majority of students slept more than 7 hours per night (52.1%), with an average of 6.22 ± 1.11 hours. On average, a nursing student took 19.33 minutes to fall asleep, with 32.9% needing 16 - 30 minutes. Most students were not affected by daytime sleep deprivation (71.7%), and those with high sleep efficiency (≥ 85%) accounted for 31.3%. 77.1% self-assessed their sleep quality as relatively good or good, while only 0.8% considered it very poor. Most did not use sleeping pills (99.6%). The results showed that 55.4% of the students participating in the study had poor sleep quality according to the PSQI scale.

Table 2. Subscale-scores and total score of the PSQI scale

Variable	Category	n	%
Sleep duration		6.22 ± 1.11 hours	
Sleep latency		19.33 ± 16.13 minutes	
Day dysfunction due to sleepiness	Never	172	71.7
	< once a week	51	21.3
	1 - 2 times per week	12	5.0
	≥ 3 times per week	5	2.1
Sleep efficiency	< 85%	75	31.3
	≥ 85%	165	68.7
Subjective sleep quality	Good or above	185	77.1
	Bad	53	22.1
	Very bad	2	0.8
Use of sleeping medication	Never	239	99.6
	< once a week	1	0.4
	1 - 2 times per week	0	0
	≥ 3 times per week	0	0
PSQI total score		5.15 ± 2.58	
Good sleep quality (PSQI < 5)		140	44.6
Bad sleep quality (PSQI ≥ 5)		100	55.4

The status of smartphone addiction among nursing students

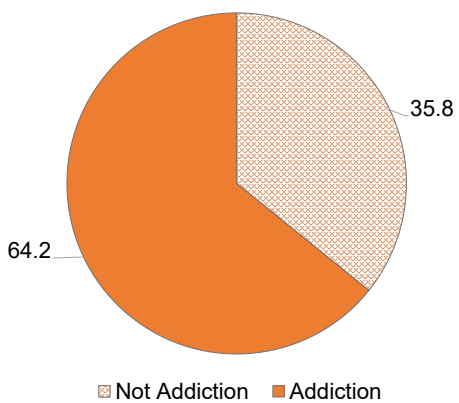

Chart 1. Proportion of Smartphone Addiction among Nursing students

Overall, 64.2% of participants met the criteria for smartphone addiction, while 35.8% were not classified as addicted. This indicated a relatively high prevalence of smartphone addiction among nursing students.

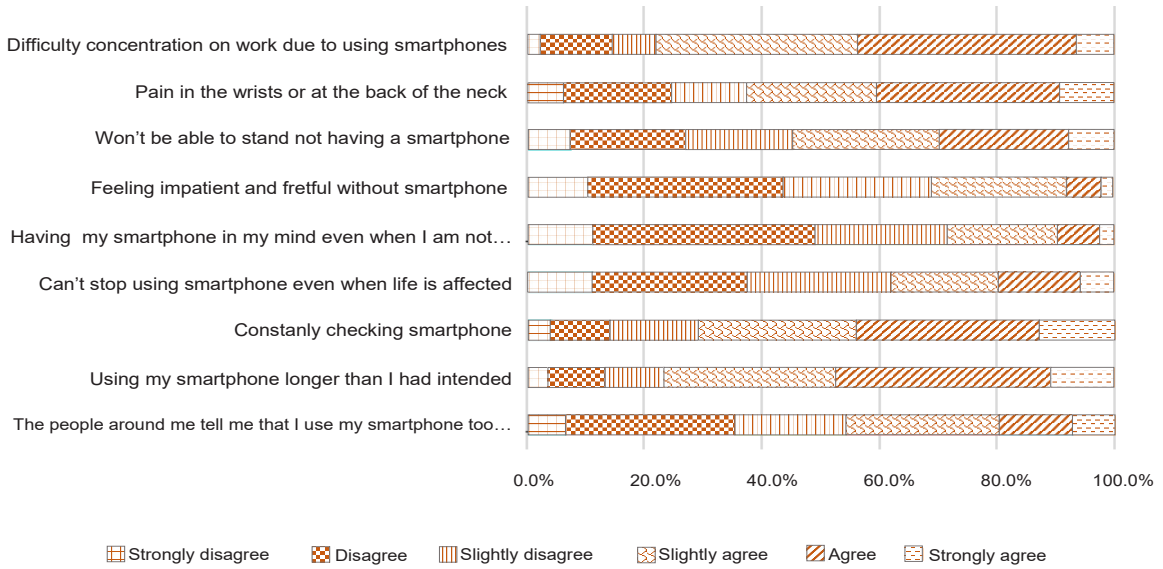

Chart 2. The symptoms of smartphone addiction

Chart 2 illustrates that among the symptoms of smartphone addiction, "difficulty concentrating on work due to using smartphone", "using my smartphone longer than I had intended," and "constantly checking the phone" were the most common symptoms among the participants, with respective percentages of 78%, 70.9%, and 76.7%.

Some factors related to smartphone addiction among nursing students

Table 3. Factors associated with smartphone addiction among nursing students: results of multivariate.

Characteristics		Addiction n (%)	Not addiction n (%)	aOR	95%CI	
Gender	Female	132 (63.2)	77 (36.8)	0.62	0.25	1.58
	Male (ref.)	22 (71.0)	9 (29.0)	1		
Year of study	Year 2	42 (73.7)	15 (26.3)	0.53	0.23	1.20
	Year 3	46 (69.7)	20 (30.3)	1.18	0.51	2.72
	Year 4	38 (62.9)	23 (37.1)	1.46	0.66	3.20
	Year 1 (ref.)	27 (49.1)	28 (50.9)	1		
Participant in clubs	No	84 (60.9)	23 (37.1)	1.19	0.66	2.13
	Yes (ref.)	70 (68.6)	32 (31.4)	1		
Living with	Parents	26 (63.4)	15 (36.6)	0.81	0.38	1.71
	Others (ref.)	128 (64.3)	71 (35.67)	1		
Part-time	No	119 (61.7)	74 (38.3)	1.30	0.60	2.83
	Yes (ref.)	35 (74.5)	12 (25.4)	1		

Characteristics		Addiction n (%)	Not addiction n (%)	aOR	95%CI	
Relationship	Alone	108 (67.1)	53 (32.9)	1.59	0.86	2.95
	Dating (ref.)	46 (58.2)	33 (41.8)	1		
Alcohol cónumption	Sometimes	77 (63.1)	45 (36.9)	0.83	0.48	1.44
	Usually	5 (83.3)	1 (16.7)			
	Always	1 (100.0)	0 (0.0)			
	Never (ref.)	71 (64.0)	40 (36.0)	1		
Caffein consumption	Sometimes	86 (63.2)	50 (36.8)	1.44	0.89	2.32
	Usually	15 (83.3)	3 (16.7)			
	Always	4 (100.0)	0 (0.0)			
	Never (ref.)	49 (59.8)	33 (40.2)	1		
Sleep quality	Poor*	76 (76.0)	24 (24.0)	2.42	1.33	4.41
	Good (ref.)	78 (55.7)	62 (44.3)	1		

**p chi-square test < 0.05*

The study results indicated a significant correlation between sleep quality and smartphone addiction among nursing students, with a statistically significant level of p = 0.004. Specifically, smartphone addiction among students with poor sleep quality is 2.42 times higher compared to other students. Additionally, factors such as gender, academic year, participation in clubs, residence, part-time work, alcohol consumption, and caffeine consumption did not reach statistical significance regarding smartphone addiction (p > 0.05).

IV. DISCUSSION

The study found that the rate of smartphone addiction among nursing students at the Hanoi Medical University - Thanh Hoa Campus was 64.2%. Our findings are consistent with Pham Thi Thu Dong study (2021), which reported a smartphone addiction rate of 65.3%.[15] Comparatively, international data indicated that the rate of smartphone addiction among nursing students in our study was higher than Turkey, which was 42.4%.[16] These differences between subjects may be attributed to variations in living environments, study conditions, and other influencing factors.

In this study, the rate of students with poor sleep quality was 55.4%. A review of research involving 25.735 medical students from different continents found that poor sleep quality was most prevalent in Europe, followed by the Americas, Africa, Asia, and Oceania, with an overall poor sleep quality rate of 52.7%.[17] However, a study by Pham Thi Thu Dong and colleagues reported that the rate of poor sleep quality among nursing students was 33.33%.[15] This discrepancy may be related to factors such as the living and studying environment, lifestyle habits, and other personal factors.

In our study, students with poor sleep quality had a 2.42 times higher rate of smartphone addiction compared to those with good sleep quality. Poor sleep quality has been identified as a factor associated with smartphone

addiction among medical students, and many researchers had examined this relationship. In 2023, Nikolic et al. found that medical students with poor sleep quality were 1.65 times more likely to be addicted to smartphones (95% CI: 1.16 - 2.23; p < 0.005) than those with good sleep quality.[18] Similarly, Demirci et al. concluded that smartphone addiction was linked to poor sleep quality (95% CI: 0.22 - 0.33, p < 0.001).[19] In addition, Zong et al. also concluded that smartphone addiction has a positive relationship with poor sleep quality (r = 0.17 - 0.31).[20] From the above results, it can be concluded that poor sleep quality is related to smartphone addiction in medical students. Smartphone use had been shown to negatively impact sleep quality by reducing REM sleep and slow-wave sleep, as well as disrupting melatonin secretion. The blue light emitted by smartphone screens affected sleep by altering circadian rhythms, thereby compromising sleep quality. When students had trouble falling asleep or waking up during the night, they might turn to their smartphones. This interaction worsen both smartphone addiction and poor sleep quality.

Furthermore, our results showed that smartphone addiction was not related to some factors such as gender and the use of stimulants. This finding was similar to results found by a study in India.[8] However, a study by Kim SG in South Korea reported that females were 1.75 times more likely to have smartphone addiction than males. Moreover, the probability of addiction among individuals who use alcohol and tobacco was higher than among those who do not.[4] This difference might be due to geographical and variations in sample characteristics between countries. Therefore, further research from different populations is needed to clarify these associations.

This study had several limitations. First, its cross-sectional design did not allow the establishment of causal relationships. Second, the relatively small sample size and recruitment from a single institution restricted the external validity of the findings. Therefore, caution should be exercised when generalizing these results to broader populations, and further studies with larger, more diverse samples are warranted.

V. CONCLUSIONS

The study aimed to investigate the rate of smartphone addiction, sleep quality, and related factors among nursing students at Hanoi Medical University - Thanh Hoa Campus. The results indicated that 64.2% of the students met the criteria for smartphone addiction. Students with poor sleep quality made up 55.4% of the sample. Multivariate logistic regression analysis revealed that students with poor sleep quality were 2.42 times more likely to be addicted to smartphones compared to those with good sleep quality (p < 0.05). These findings contribute to increasing students' awareness of smartphone usage, thereby supporting the development of effective interventions and strategies to enhance mental health and reduce smartphone addiction rates among nursing students.

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