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EFFECTS OF SMARTPHONE USE ON SLEEP QUALITY AMONG NURSING STUDENTS IN MOROCCO

Nezha Nacer [1]*, Jaouad Chouikh [2] and Nadia Ouzennou [3]

[1,2] Higher Institute of Nursing and Health Techniques of Marrakech, Essaouira Annex, Ministry of Health and Social Protection, Morocco.
[3] Higher Institute of Nursing and Health Techniques of Marrakech, Ministry of Health and Social Protection, Morocco.
*Corresponding Author Email: nezha.nacer@ced.uca.ma

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Abstract

Context and objective: Poor quality sleep, a global public health problem, is a major burden for individuals, especially for healthcare students facing intense academic stress. This study aims to examine smartphone addiction and its effect on the quality of sleep of nursing students. **Materials and methods**: A descriptive cross-cutting survey was conducted with 180 nursing students at the Superior Institute of Nursing Sciences and Health Technology (ISPITS) in Essaouira, Morocco. We collected various data using a sociodemographic questionnaire, the Pittsburgh Sleep Quality Index (PSQI), and the short version of the of the smartphone addiction survey. (SAS-SV). **Results**: A total of 210 students participated in this study (average age of 19.6 years, of whom 70.5% were women). The analysis showed that 70.5% of students suffered from poor sleep quality, and 22.8% were addicted to smartphones. A positive correlation was observed between smartphone dependence and sleep quality ($r = 0.346$, $p < 0.001$). Furthermore, our results indicate that participants aged 20 years and older (OR=1.53, 95% CI=1.04-1.89), those in their third year of study (OR=2.21, 95% CI=1.82-2.34), and those using their phones for more than four hours a day (OR=2.97, 95% CI=2.32-3.85) are significantly associated with smartphone addiction ($p< 0.05$). **Conclusion:** Our findings indicate that smartphone addiction is linked to sleeping difficulties among nursing students. These results highlight the need for educational activities to encourage the responsible use of smartphones among this group of students.

Keywords: Sleep; Pittsburgh Sleep Quality Index; Nursing Students; Sleep Quality; Addiction; Smartphones.

INTRODUCTION

More than 2.87 billion people worldwide are estimated to be smartphone users by 2020, which has led to a revolutionary change in our societies through the development of smart instruments such as these Internet-connected devices (1). In addition, there was a 1.8% increase in smartphone use between January 2020 and January 2021, a period characterized by the COVID-19 pandemic. On average, individuals spend 6 hours and 54 minutes online, checking their phones about 160 times a day, or approximately every 9 minutes, according to 2020 data (2).

Young adults represent one of the most significant target markets and the largest consumer group for smartphone services (3–5). Smartphones have revolutionized societies by offering young adults easy access to the Internet, email, desktop apps, games, and more (6,7).

However, the relative lack of mature self-regulation and lack of information can lead to a risk of addictive smartphone use in young adults (8,9). Smartphone addiction affects university students (7,10,11). According to a study of students at King Saudi University in Saudi Arabia, almost one in two students (48%) have this addiction (12). Another study of students from different universities in China showed that 13.5% of university students could be classified as smartphone addicts (13).

The World Health Organization (WHO) has suggested that excessive use of the Internet and electronic devices, including smartphones, is generally associated with physical health problems or accidents (6). Among the psychosocial consequences, WHO notes the existence of problems in areas such as violence (cyber-intimidation), social development (social retreat), sleep deprivation, and other psychological problems (14).

Numerous studies have demonstrated the negative impact of smartphone addiction on the quality of sleep (10–12), alteration of the wake-up rhythm, and a higher incidence of insomnia (15). Moreover, it also seems that people with sleep disorders are more likely to become addicted to smartphones (15).

Lack of quality sleep, a global public health problem, is a heavy burden for individuals, especially for healthcare students who face intense academic stress (16). In addition, in a clinical context, smartphone abuse can be a major source of distraction, resulting in possible negligence and health risks for patients (17).

In order to analyze the effect of smartphone addiction on sleep quality, a cross-sectional survey was conducted among students enrolled at the Superior Institute of Nursing Sciences and Health Techniques (ISPITS) in Essaouira, Morocco.

MATERIALS AND METHODS

Study type

This cross-cutting study was conducted between May 1 and May 31, 2020, involving students at Institute of Training in Nursing Professions and Health Technicians (ITNPHT) in Essaouira, Morocco..

Population of study

Participants in the study were all nursing students of all levels and options at the ISPITS of Essaouira, Participation was voluntary, and responses were anonymized.

Data collection

The data were collected using a self-managed questionnaire. It was tested on 12 participants, who were subsequently excluded from the study sample.

Participants completed various self-assessment questionnaires. A specially designed questionnaire was used to collect socio-demographic data of participants, such as gender, age, year of study, place of residence during studies (with parents, apartment, room, accommodation, etc.), monthly family income (less than 3000 dirhams, more than 3000 dirhams), smoking (smoking, non-smokers), and alcohol consumption (oui, non). In addition, participants were asked how much time they spent each day using their smartphones.

The smartphone dependency level was assessed using the abbreviated version of the smartphone dependence scale (SAS-SV) (6). The SAS-SV is a validated instrument consisting of 10 items that participants evaluate on a Likert scale of 6 points (from 1 = totally disagree to 6 = totally agree).

The overall score on this scale ranges from 10 to 60, with higher scores indicating a high degree of smartphone dependence. The scale items cover various aspects of addiction, such as disruption of daily activities, withdrawal symptoms, virtual relationships, excessive use, and tolerance.

SAS-SV offers the advantage of identifying a group that is potentially at risk of smartphone addiction, whether in educational contexts or in the wider community. For men, a threshold score of 31 is considered an indicator of addiction, while for women, the corresponding threshold is 33 (6).

Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI), a questionnaire designed to evaluate the subjective quality of sleep over a period of one month (18). The PSQI consists of 19 self-assessed questions divided into seven components: subjective sleep quality, sleep latency, sleep duration, sleep effectiveness, sleep disorders, sleep pill use, and daytime dysfunction. Each component is awarded a score, and these scores are added to obtain the overall PSQI score, which ranges from 0 to 21. Higher scores indicate a lower quality of sleep. A threshold of 5 is often used to divide participants into two groups. A group of good sleep quality (PSQI < 5) and a group of poor sleep quality (PSQI ≥ 5) (18).

Ethical Considerations

The approval of this study was obtained from the management of the Essaouira ISPITS (No. 2020/12), and it was carried out in accordance with the principles of the Helsinki Declaration. All participants gave their informed consent to participate, confirming their consent by continuing the survey, which included a consent form on the homepage. Detailed information on voluntary participation and data confidentiality was provided to participants

Data analysis

The data were analyzed using SPSS software version 26.0 (SPSS Inc., Chicago, IL, USA). Descriptive methods were applied, including the computation of means, standard deviations, medians, and minimum and maximum values. To compare the two participant groups, either parametric tests (independent samples t-test) or non-parametric testing (chi-square) were utilized. The independent samples t-test were used for numerical variables, while the chi-square test was used for categorical variable. Differences were considered statistically significant if the p-value was less than 0.05. To determine the factors contributing to smartphone dependence, logistic regression analyses were conducted. Smartphone dependence, assessed using the recommended thresholds of 31 for men and 33 for women, served as the dependent variable.

RESULTS

Description of the Study Population

A total of 210 students responded to the questionnaire, 70.5 per cent of whom were women and 29.5 per cent were men. Students were spread across different academic levels, with 38.1% of first year students, 45.7% of secondary students and 26.2% of third-year students. The age of participants was 18 to 29, with 43.8% of students aged 19 and under, 56.2% of students age 20 and over, and an average age of 19.62 years. Most students (82.4%) live with their parents, while only 2% are married. Only 7.6% of students are smokers. The smartphone usage time exceeds 4 hours per day for 64.4% of students and the average number of hours spent on mobile was 5.6 ± 3.34 per day. This information is presented in Table 1.

Table 1: Distribution of participants characteristics

Characteristics	*Frequency*	*Pourcentage*
Age, years		
≤ 19	92	43.8
≥ 20	118	56.2
Age, years (X̄, ±SD)	19.62 ±2.34	
Gender		
Male	62	29.5
Female	148	70.5
Year of study		
1	80	38.1
2	75	45.7
3	55	26.2
Residence durin studies		
Wikh parents	173	82.4
Apparetement/room/dorm/other	37	17.6
Socio-economic status		
Less than 3000 dirhams	60	28.6
More than 3000 dirhams	150	71.4
Social status		
Single	206	98
Married	4	2
Smoking		
Yes	16	7.6
No	194	92.4
Hours of daily smarthone use		
Less than 2 H	25	12.2
From 2 to 4 H	50	23.4
More than 4 H	135	64,4
Someil quality		
Poor someil quality (PSQI ≥ 5)	128	70.5
Good someil quality (PSQI < 5)	62	29.5

X̄, Mean ; SD, Standard Deviation ; H, Hours

Prevalence of smartphone addiction among nursing students by gender

A sample of 49 students (22.8%) who completed the SAS-SV showed that they were addicted to smartphones (table 2). Our results showed that the average SAS-SV score was 25.58 ± 8.04 out of 60. Men appear to be more addicted to smartphones (30.6%) than women (20.3%), with a significant difference (p<0.05).

Table 2: Prevalence of smartphone addiction among nursing students by gender

	Total	*Females*	*Males*	*p-value*
SAS-SV score				
X̄, ±SD	25.58±8.04	26.18±8.13	24.54±8.10	**0.032***
Median (min-max)	25 (10-56)	26 (10-58)	23 (10-56)	
Smartphone addiction				
Addicted	49 (22.8)	30 (20.3)	19 (30.6)	**0.020****
Not addicted	161 (76.2)	118 (79.7)	43 (69.4)	
SAS-SV, Smartphone Addiction Scale-Short Version; X̄, Mean ; SD, Standard Deviation ; *p-value for Stendent's t-test ; **p value for χ^2 test ; Bold value indicate statistical significance.				

Factors associated with smartphone addiction among nursing students

Our results (Table 3) showed that participants aged 20 years and over (OR = 1.53, $IC_{95\%}$= 1.04–1.89), in the third year of the study (OR = 2.21, $IC_{95\%}$=1.82-2,34), who spent more than four hours a day on their mobile phone (OR = 2.97, $IC_{95\%}$=2.32-3.85), who had poor sleep quality (OR = 3.36, IC95%=2.51-5.27) were significantly associated with smartphone addiction (highest SAS-SV score) (*p* values < 0.05, 0.01, 0.001, 0.001, respectively). Our results showed no association between smartphone addiction, female students living outside their parents' homes, participants with a family income above 3000 dirhams, and single students (*p* values 0.218, 0.549, and 0.879, respectively).

Table 3: Factors associated with smartphone addiction among nursing students

	Addicted (N=49) n (%)	***Not addicted (N=161) n(%)***	***OR (95%CI)***	***p-value***
Demographic characteristics				
Age				
≤ 19	36 (72.8)	56 (34.7)	Ref.	
≥ 20	13 (27.2)	105 (65.3)	1.53 (1.04-1.89)	0.034*
Gender				
Male	16 (25.8)	46 (74.2)	Ref.	
Female	33 (29)	115 (71)	1.61 (1.19-2.23)	0.886 NS
Year of study				
1	24 (29.4)	56 (70.6)	Ref	
2	23 (30.5)	52 (69.5)	1.06 (0.74-1.54)	0.735 NS
3	21 (38.3)	34 (61.7)	2.21 (1,82-2,34)	0.007**
Residence during studies				
Wikh parents	48 (27.7)	11 (29.4)	Ref.	
Apparetement/room/dorm/other	125 (72.3)	26 (70.6)	1.19 (0.87-1.66)	0.218 NS
Socio-economic status				
Less than 3000 dirhams	19 (31.6)	41 (68.4)	Ref.	
More than 3000 dirhams	30 (20.0)	120 (80.0)	1.25 (0.89-1.79)	0.549 NS
Social status				
Married	1 (25.0)	3 (75.0)	Ref.	
Single	48 (23.3)	158 (76.7)	1.56 (1.17-2.20)	0.879 NS
Hours of daily smarthone use				
Less than 2 h	5 (20.0)	20 (80.0)	Ref	
From 2 to 4 h	12 (24.0)	38 (76.0)	1.89 (1.18-2.73)	0.012*
More than 4 h	32 (23.7)	63 (76.3)	2.97 (2.32-3.85)	0.000***
Someil quality				
Good someil quality	07 (11.3)	55 (88.7)	Ref	
Poor someil quality	42 (32.8)	86 (67.2)	3.36 (2.51-5.27)	0.000***
n: Frequency; %: Percentage; r= correlation coefficient; NS: Non-significant: p>0,05; *: p<0.05; **: p <0,01; ***: p >0,001				

Correlation between smartphone addiction and sleep quality

The results revealed a positive correlation between smartphone addiction and sleep quality (r = 0.346, p < 0.001), indicating that respondents experienced a deterioration in sleep quality as smartphone addiction and the overall PSQI score increased (Table 4).

Table 4: Pearson correlation between smartphone addiction and sleep quality

	Global PSQI	p-value
SAS-SV	0.346	p < 0,001

DISCUSSION

The aim of this study was to study the impact of smartphone use on sleep quality among nursing students at ISPITS Essaouira, Morocco. In fact, nursing students use smartphones to access educational resources in a variety of academic and non-academic contexts, in addition to their personal non-academic uses (19). However, as many studies have shown, improper use of these smart devices has negative effects on the health of users (20–23). In this regard, the present study found that 64.4 students spent more than 4 hours a day and that the average number of hours spent on mobile devices was 5.2 ± 2.34 hours per day. This is similar to Alosaimi et al. (2016), who found that half of health science students spend 3 to 6 hours a day on their smartphones (24). In this study, 70.5% of students had poor sleep quality. Previous studies of university students have suggested poor sleep quality, and this study confirms these public health concerns (25). Indeed, a study by Aldhawyan and colleagues (26) found that 75.4% of first-year medical students at Imam Abdulrahman bin Faisal University suffered from poor sleep quality. Moreover, a recent study by Bousgheiri et al. (2024) found a 74% rate of poor sleep quality among medical students in northern Morocco and Spain (16). The poor quality of sleep observed in this study could lead to significant health risks.

With regard to smartphone addiction, the results of this study show that 22.8 participants who completed the SAS-SV showed signs of addiction.

In our study, we observed a significant association between spending more than 4 hours a day on a smartphone and smartphone addiction. Other researchers found similar results, showing that increased frequency and duration of phone use increase the risk of addiction (6,27). In addition, the prevalence of smartphone addiction varied depending on the age group. Younger people are more dependent than older people. This is consistent with several studies that systematically show that the prevalence of addiction is higher among young people (28,29). However, in our study, we found no significant differences between men and women in this regard. This result is consistent with the study by Nikolic et al. (27) in Serbia and Chen et al. (3) in China, which also used the SAS-SV scale to assess smartphone dependence among medical students, revealing no significant difference in the prevalence of dependence between men and women. On the other hand, some studies show a higher prevalence of smartphone addiction among women (28,30).

This study revealed a significant positive correlation between smartphone addiction and sleep quality, as the quality of sleep of respondents deteriorated as smartphone dependence increased and overall PSQI increased. These results confirm the findings of other studies (26,27,31). In fact, another study in India found that students who overuse smartphones had higher overall PSQI scores (32). Furthermore, another study in South Korea confirmed our findings, showing that high scores on the SAS-SV scale were associated with poor sleep quality (33). An association between smartphone addiction and sleep quality was also found in another parallel study in Egypt, where smartphone dependence was associated with lower sleep quality (34). Furthermore, Van den Bulck (2004) found that people who use electronic devices

before going to bed tend to go to bed later and feel more tired during the day (35). In addition, poor sleep quality can increase mistakes in medical and nursing students (16,25). Therefore, reducing the use of electronic devices, including smartphones, before going to bed should help improve the quality of sleep (31). In fact, limiting the use of the phone to only one week increases the time the lights go off by 17 minutes and the time to sleep by 21 minutes (36).

It is important to consider the limitations of the study when interpreting the results. The limitations of this study stem from its cross-sectional design. Causality cannot be demonstrated in cross-cutting studies, including association management. However, despite the above-mentioned limitations, the SAS-SV and PSQI scales are the most commonly used instruments for evaluating smartphone dependence and sleep quality.

CONCLUSION

In this survey, 22.8% of nursing students were addicted to smartphones. Furthermore, this study found a significant positive correlation, suggesting that the level of smartphone addiction is associated with the quality of student sleep, which suggests that excessive use of smartphones may have a negative impact on sleep.

Therefore, it is important that future studies study in greater depth the underlying mechanisms and relationships between smartphone addiction and various psychosocial factors such as stress, anxiety, and time management in our context. A deeper understanding of these relationships will enable us to develop targeted interventions and effective prevention strategies to address this growing public health problem, taking into account the unique needs of nursing students.

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