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Internet Addiction and Insomnia Severity amongst Female Nursing Students: A Cross-sectional Correlational Study

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Abstract:

Background*:*

Long-term use of the internet may increase the possibility of Internet Addiction (IA), which can cause sleep disturbances. The quality of good sleep is essential for academic achievement and well-being for nursing students. The study aimed to identify the prevalence and association of IA and insomnia intensity amongst female nursing students in Saudi Arabia.

Materials and Methods: *A cross-sectional correlation design was used. A sample of 248 female undergraduate students at a nursing college at one of the public universities in Saudi Arabia (SA) participated in this study. Three tools were used to collect the data: (1) Demographic and Background Form (DBF), (2) Internet Addiction Test (IAT), and (3) Insomnia Severity Index (ISI).*

Results: *The average age of the participants was 20.52 (± St. Deviation: 1.51). Most of the participants (89.1%) had mild to moderate IA, while 10.9% had no IA. The majority (87.1%) reported clinical insomnia, with 39.5% experiencing mild insomnia, 38.3% moderate insomnia, and 9.3% severe insomnia. The IA is significantly associated with the insomnia severity (r = 0.316; p <.001).*

Conclusions: *Insomnia and IA are highly prevalent and correlated among female nursing students. Nursing educators have a big responsibility to increase students' understanding of the dangerous health consequences which might be resulting from misuse and overuse of the internet and the management of insomnia. Periodic screening of nursing students for IA and insomnia is required, especially before starting their clinical training. Social media addiction and its impact on biopsychosocial health of female nursing students should be investigated.*

Keywords:*Addiction, Internet, Insomnia, Nursing*

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I. Introduction

The internet is widely used around the world, particularly by adolescents and university students, as it is at hand and easily accessible at any time, for e-learning or entertainment[1-3]. While it cannot be denied that the internet offers many opportunities, it must also be understood that excessive use can cause mental health problems such as Internet Addiction (IA) disorder[4,5]. University students have been found highly susceptible to developing IA disorder[6].

The IA phenomenon is understood to be caused by the inability of regulating time spent on the internet while realizing the damaging impact on psychosocial and physical health[2,7]. Thus, the overuse of the internet doesn't necessarily indicate that the student has an IA. Internet usage becomes a health problem when it interferes with the student's daily life activities and academic achievement[8].

The occurrence of IA in the Middle-East is 10.9%, a whole 4% more than the global occurrence of 6%[8]. A recent survey in Saudi Arabia found that out of 2367 university students, around a quarter of the participants spent more than eight hours daily using their mobiles; three quarters used no less than four application a day, primarily to watch the news and for social networking[9].

Internet Addiction (IA) has become a more common cause for experiencing many symptoms, including anger, stress and anxiety, depression, lack of energy, unhealthy lifestyle, and sleep problems[9-11]. IA has become a more common cause for sleeping problems, reduced sleep hours, and an unhealthy lifestyle among university students in recent years[9,12,13]. Students studying health sciences, especially medical, pharmaceutical, and nursing students, are more likely to report sleep problems such as insomnia, deprivation, and drowsiness[14-16].

Insomnia is the complaint "of disturbed sleep in the presence of adequate opportunity and circumstance for sleep; the disturbance may consist of one or more of three features: difficulty in initiating sleep; maintaining sleep, or waking up too early" [14]. Sleep is considered to be one of the basic daily needs for humans and its quality is a major element of learning and memory[17]. Poor quality of sleep can affect negatively on the students' academic performance and their mental health[18,19]. Lack of sleep may impair the ability of the students to pay attention in class and cause excessive daytime sleepiness[17]. Female students seem to be at a higher risk of IA[17]. However, little is known about the IA and its relation to insomnia among female nursing students, particularly in the Middle-east region.

The nursing study requires students to be alert and constantly engaged in the learning process. Clinical practice requires continuous training in clinical settings. Therefore, nursing students should have the mental and physical ability to perform their skills in a safe manner for the patients' safety and quality of care.

Aim of the study

The study aimed to identify the prevalence and association of IA and insomnia amongst female nursing students in Saudi Arabia.

II. Material and Methods

Study Design

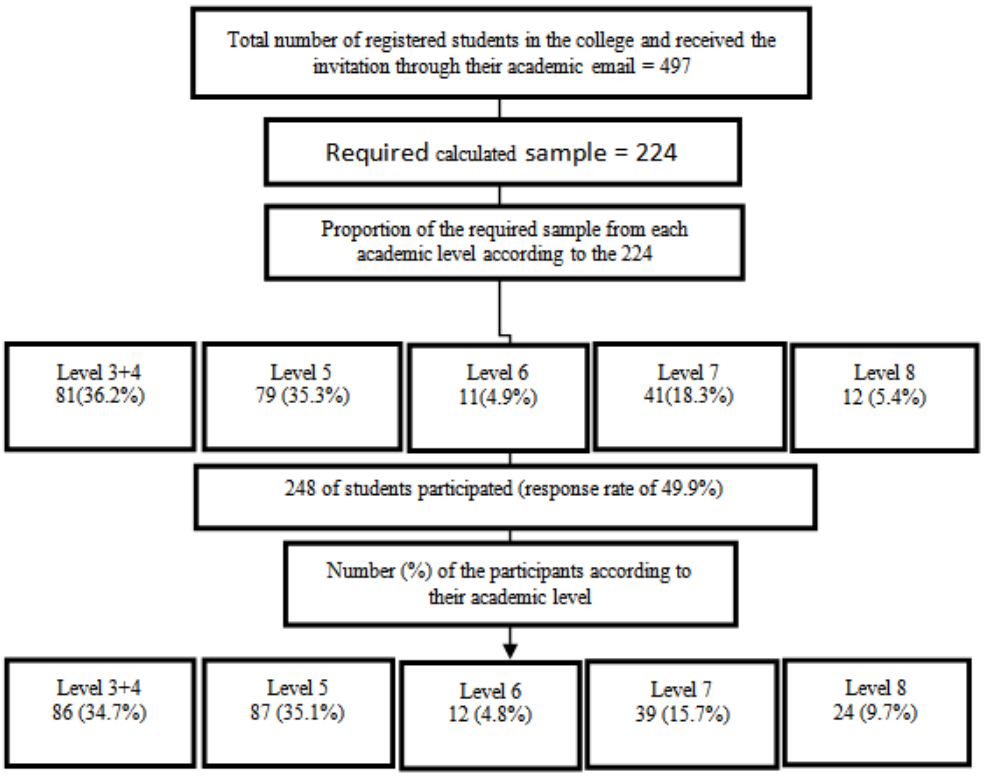
A cross-sectional correlational design was used.

Setting and Sample

Undergraduate nursing students from a nursing college at one of the public universities in Riyadh, Saudi Arabia participated in this study from 15 to 26 October 2018 by filling out an anonymous electronic questionnaire. Students who are registered at some point before the internship year, and after level two (called students in their specialty years), 18 years or older, had access to the internet and gave informed consent were eligible to take part in the study. The list of registered students for disseminating the electronic survey via email was obtained from the College of Nursing's Academic Affairs.

Using Slovin's formula, the required sample was 224. The number of students in each of the academic level was calculated using the proportional method (Figure 1). Out of the invited 497 students, 248 participated, which resulted in a 49.89% response rate.

Figure 1. Sample distribution



Measures

A demographic and background Form (DBF)were designed to collect data on age, marital status, and educational level.

The Internet Addiction Test (IAT)is a scale that was used to assess the occurrence and severity of IA. It has 20 items with a five-point Likert scale ranging from "*Rarely*" to "*Always*". The items can be summed up together to give a total score of 100 that can be categorized as *regularinternet user* = 0–30, *mild user* = 31–49, *moderate user* = 50–79, or *severe user* = 80–100. IAT has an internal consistency and satisfactory retest reliability; (*r* = 0.73 & 0.88)[20]. Arabic version was used[21]. In this study, the total score ranged from 0-95, because item 18 was considered missed data.

Insomnia Severity Index (ISI) is a widely used scale for the evaluation of insomnia. It is a short index that has only seven items with a Likert scale ranges from 0 indicates no disturbances to 4 indicates very severe discomfort. The seven items can be integrated to give a total score which is categorized into *No-insomnia* = 0–7; *Sub-threshold insomnia* = 8–14; *Moderate insomnia* = 15–21; and *Severe insomnia* = 22–28. The Arabic version has a Cronbach's alpha coefficient of 0.84 that supports its reliability[22].

Data Analysis Plan

The data was downloaded on an excel form before analysis, using the Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: USA). Descriptive statistic was calculated to capture the characteristics of the participants. Comparisons were made based on the characteristics of the participants using the ANOVA test (i.e., Kruskal-Wallis Test) or the Student's t-test. Chi-square test assessed the statistical correlations between the qualitative variables. Fisher's exact test examined the statistical associations between nominal variables when 20% of the number of cells was less than five, and a Person correlation test was applied to assess the association amongst the continuous variables. The point of the accepted significance level was $p < .05$.

Ethical Considerations

Approval from the Institutional Review Board (IRB) for the study was sought (Ref No. 18-0261). Approval from the Dean of the College of Nursing to conduct the study was obtained.The purpose was explained to the participants on the front page of the electronic survey to get the participants' consent before proceeding. The participants were informed that withdraw from the study at any time is possible without any repercussions. This study did not cause any harm to the respondents. Confidentiality and privacy of the participants were maintained throughout the study, and the collected data were kept confidential on a protected device that could be accessed by the researchers. Only general information was collected without any identifying personal data.

III. Result

Demographic Characteristics

All participants were female students (*n* = 248, 100%), with an average age of 20.52±1.51 (age range of 18–28 years). The majority of them were singles (92.3%) and nonsmokers (94.4%). A few (8.9%) of them had a coexisting systemic disease, with asthma (4%) and diabetes mellitus (2.4%) are the most reported ones (Table 1).

Table 1. Demographics characteristics of the participants (N = 248)

Variables		**Mean ± SD**	**Internet addiction**	**Test of sig.**	**Insomnia severity**	**Test of sig.**
Age		20.52±(1.51)	-0.1 (0.84)[r]		0.08 (0.19)[r]	
Variable		**N (%)**	**Mean ± SD**		**Mean ± SD**	
Marital Status	Single	229 (92.3)	38.24±15.14	1.24 (.23)[a]	13.76±5.61	0.63 (.43)[a]
	Married	15 (6.0)	35.87±14.27		14.73±6.45	
	Divorced	4 (1.6)	30.50±28.03		15.25±10.94	
Smoking	Yes	14 (5.6)	37.86±9.12	0.03 (.98)[t]	14.00±15.93	-1.40 (.16)[t]
	No	234 (94.4)	37.98±15.59		23.40± 13.72	
Coexisting systemic disease	Yes	22 (8.9)	42.23±16.03	-1.37 (.17)[t]	16.09±7.45	-1.94 (.05)[t]
	No	226 (91.1)	37.56±15.19		13.62±5.52	
Academic level	3	85 (34.3)	35.53±15.74	2.53(.11)[k&a]	13.48±5.99	0.87 (.35)[k&a]
	4	1 (0.4)	32.0±00		26.00±00	
	5	87 (35.1)	38.49±14.33		13.76±5.25	
	6	12 (4.8)	42.83±15.75		14.00±4.33	
	7	39 (15.7)	42.05±15.33		13.31±6.22	
	8	24 (9.7)	35.96±16.24		15.71±5.96	

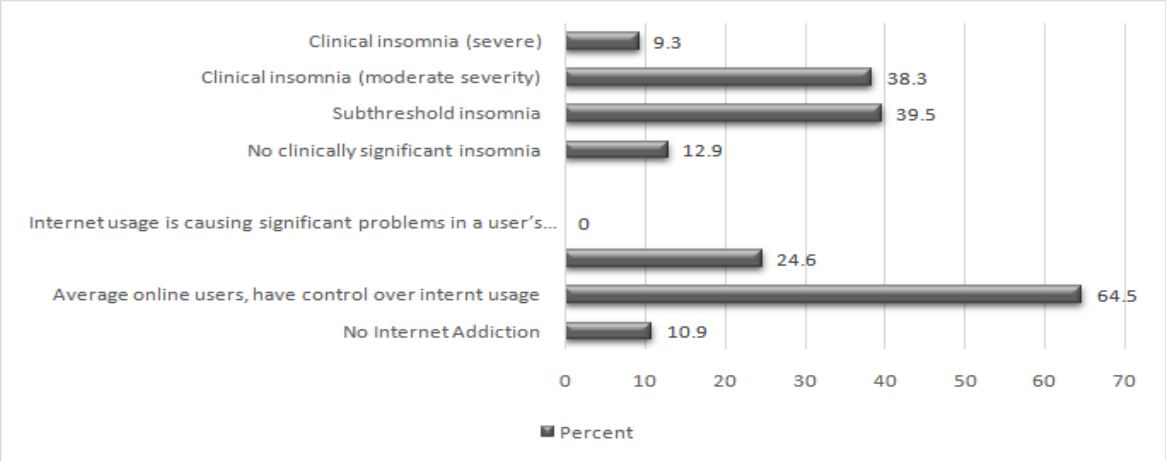
Note: Test type

r: correlation test t: T test c: Chi-square f: Fisher exact test a. ANOVA k: Kruskal-Wallis test

Internet Addiction Prevalence

Figure 2 depicts the IA level as rated on the IAT. The majority (89.1%) of participants had mild to moderate IA. Students' demographic characteristics showed insignificantdifference in IA levels (p >.05) (Table 1).

Figure 2. Prevalence of internet addiction and insomnia severity (N = 248)



Prevalence of insomnia severity

Figure 1 shows an increase in the severity of insomnia among the participants, where 87.1% had clinical insomnia. The characteristics of the students made no statistically significant difference in the insomnia levels (p >.05) (Table 1).

The Association of Demographic Characteristics with IA and ISI

The demographic variables were categorized in subgroups to overcome the small sample in some categories (Table 2). Using the Fisher Exact Test, our results showed that participants with a coexisting systematic disease (such as asthma, diabetes) were more likely to report insomnia than those with no coexisting systematic disease (p =.02). Insignificant differences were noticed in relation to smoking, marital status, or academic level and IA or severity of insomnia (p >.05) (Table 2).

Table 2. Distribution of internet addiction and insomnia severity according to demographics characteristics (n = 248)

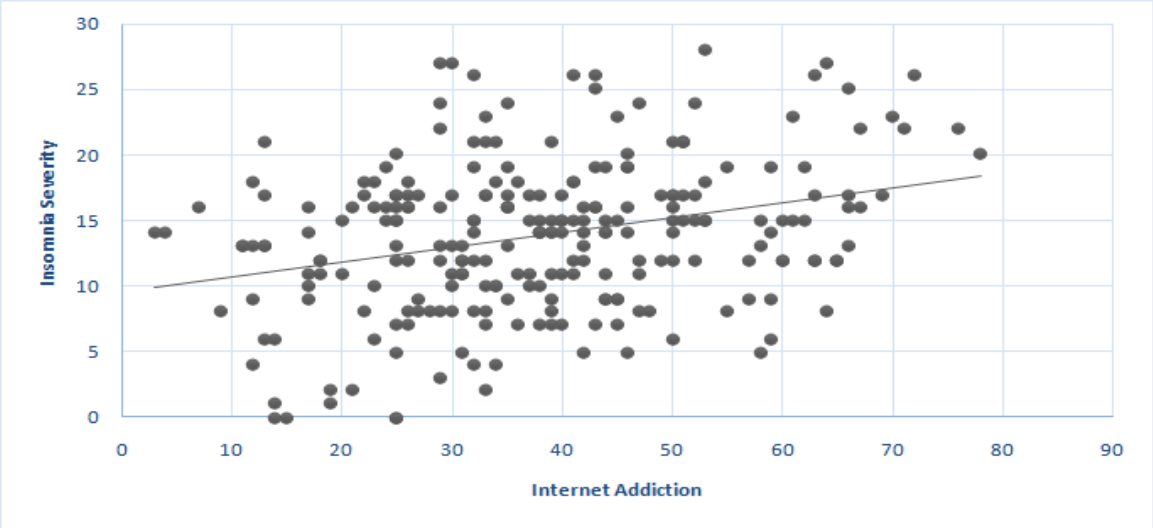
Variables		**Coexisting systemic disease**		**F(p-value)***	**Smoking**		**F(p-value)***	**Marital Status**		**F(p-value)***	**Academic level**		**F(p-value)***
		No (n=226)	Yes (n=22)		No (n=234)	Yes (n=14)		Not-married (n=233)	Married (n=15)		Levels (3-5) (n=173)	Level (6-8) (n=75)	
		N (%)	N (%)		N (%)	N (%)		N (%)	N (%)		N (%)	N (%)	
Internet Addiction categories	No Internet Addiction	27 (11.9)	0 (0)	3.23 (.22)	27 (11.9)	0 (0)	2.46 (.28)	26 (11.2)	1 (6.7)	1.23 (0.60)	20 (11.6)	7 (9.3)	3.12 (.21)
	Average online users, have control over intern usage	145 (64.2)	15 (68.2)		148 (63.2)	12 (85.7)		148 (63.5)	12 (80.0)		116 (67.1)	44 (58.7)	
	Users experience occasional or frequent problems because of the Internet	54 (23.9)	7 (31.8)		59 (25.2)	2(14.3)		59 (25.3)	2 (13.3)		37 (21.4)	24 (32.0)	
	Internet usage is causing significant problems in a user's life.	-----	-----		-----	-----		-----	-----		----	-----	
Insomnia severity categories	No clinically significant insomnia	27 (11.9)	5 (22.7)	**9.18 (.02)**	31 (13.2)	1 (7.1)	5.79 (.09)	30 (12.9)	2 (13.3)	1.67 (0.67)	21 (12.1)	11 (14.7)	0.96 (.83)
	Subthreshold insomnia	95 (42.0)	3 (13.6)		96 (41.0)	2 (14.3)		94 (40.3)	4 (26.7)		71 (41.0)	27 (36.0)	
	Clinical insomnia (moderate severity)	85 (37.6)	10 (45.5)		86 (36.8)	9 (64.3)		88 (37.8)	7 (46.7)		66 (38.2)	29 (38.7)	
	Clinical insomnia (severe)	19 (8.4)	4 (18.2)		21 (9.0)	2 (14.3)		21 (9.0)	2 (13.3)		15 (8.7)	8 (10.7)	
Internet Addiction score Mean ± SD: 37.98±15.29													
Insomnia score Mean ±SD: 13.84 (±5.74)													

Note: *Fisher Exact Test

Correlation between IA and ISI

As have been noticed in Figure 3, IA was significantly correlated to the insomnia severity (r = 0.316; at p = <.001).

Figure 3. Scatterplot showing the correlation between internet addiction and insomnia severity (N = 248)



*Note: * r (p-value): 0.316 (0.000)*

IV. Discussion

Our study was intended to identify the prevalence and association of IA, and the severity of insomnia amongst female nursing students. Therefore, we only recruited female nursing students from a College of Nursing.

The majority of the participants in our study were 18 to 28 years old, single, and non-smokers. A few of them reported a coexisting systemic disease, with asthma and diabetes mellitus being the most reported diseases. These findings are along the lines of prior research studies[23,24], which showed that the participants were 19 to 26 years old (*mean* 21 ± *SD* 21.9). However, the age of the participants in our study was mostly higher than the age range in prior studies of non-Arabic participants, where it was between 17 and 20 years[25].

The majority of our study participants had IA with only 10.9% reporting they had no IA. This result shows similarities with previous studies among university students[25,26]. Malviya et al.,[26] found that 92.6% had an IA, 64.5% had a mild IA, 18.6% had a moderate IA, and 9.5% had a severe IA. In previous study, 42% had mild IA, 34.02% had moderate IA, 1.03% had severe IA, and 17.52% had no IA[25]. The results of our study were similar even among medical students in Saudi Arabia as shown in the previous study[23]. They found that IA was significantly more prevalent amongst female medical students, it was mild in 47.8% of the students and moderate in 5.8%. Medical students did not have a severe IA[23] similar to the results of our study.

A cross-sectional study that aimed to identify the frequency of IA, and its correlation with mental health status, and academic performance (among 147 female nursing students in Saudi Arabia), showed that 59.6% of the students had an ordinary online usage, 38.4% had occasionally or frequently use, and 2.1% had considerable problems using the internet[24], which is comparable to our study's findings.

In terms of severity of insomnia, our study showed that the majority of the participants had insomnia, which is higher (87.1%) than the results of previous studies. For instance, the prevalence of insomnia was 10.6%[19]; and 51%[18]among the previous studies' participants. A recent survey in the Riyadh city (n = 2367 university students) showed that almost less than half of the students reported reducing their sleeping hours and experiencing a loss of energy, which was caused by excessive Smartphone use[9]. Also, 30% reported having an unhealthful lifestyle (i.e. consumed more fast-food, increased body weight, and exercising less), while a quarter of them said that their exams and academic results had negatively affected[9]. The quality of sleep seems to be an important factor in the learning process and intact memory. However, sleep problems are noticeable among college students, which can influence their academic progress[18].

Insufficient sleep may result in insulin resistance, hypertension, diabetes, weight gain, stress, poor academic performance, and poor health outcomes[27]. Our study found that students with coexisting systematic diseases were more liable to have insomnia than healthy students. Therefore, other contributing factors need to be explored. Further emphasis is also needed to improve the quality of nursing students' sleep, with the emphasis

placed on students with medical conditions. Students with medical conditions should be forced to follow a certain hour to sleep.

The present study has a significant association of IA with insomnia severity, similar to previous studies[10,13]. A previous study examined the sleep quality [using the *Pittsburgh Sleep Quality Index (PSQI)*] and IA (using the IAT scale) among 124 female students aged 18–22 years[13]. Their results showed that as IA increased, sleep quality was significantly reduced. Also, work neglect and internet excessive usage have been showing to be predictive of poor quality of sleep[13]. Female college students who had moderate and severe degrees of IA were experiencing the worse quality of sleep than those with mild or no IA. IA and sleep quality were shown to be closely associated with Logistic regression tests[28]. A recent meta-analysis of 23 studies (participants = 35,684) showed that reporting the presence of sleep problems, such as reduced sleep time, was signified among internet addicts[29]. Accordingly, IA is a global health problem that has negative consequences for sleep quality. Therefore, awareness needs to be raised among the population and especially among female nursing students.

V. Conclusion

As the internet is available everywhere, nursing nurses are exposed to excessive utilization of the internet, which can result in addiction. Our study confirmed a significant linkage between the severity of IA and the existence of insomnia in a large sample of female nursing students. This study denotes the importance of identifying students with potential IA and providing them with psychological support, due to the fact that this problem is often followed by other psychological problems, such as insomnia. Collecting the data from one college might limit the study's generalizability to other cities and colleges. However, our study sample size had enough statistical power, and the participants' demographic characteristics were similar to the previous studies' participants in the same country.

Based on the results of the study, we highly recommend:

- Nursing educators should be aware of the IA phenomenon in terms of its signs and symptoms.
- The nursing college should periodically test nursing students for IA.
- Conducting a regular campaign to raise awareness among educators and students about the negative health effects of overuse of the internet and how to manage its effects.
- A large longitudinal study that aims to find other factors contributing to insomnia among nursing students are required to accommodate further developments and evidence.

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