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Research Article

Evaluation of Nomophobia and Problematic Internet Use in Nursing Students: A Cross-Sectional Study

Hemşirelik Öğrencilerinde Nomofobi ve Problemli İnternet Kullanımının Değerlendirilmesi: Kesitsel Bir Çalışma

Fatma GÜNDÜZ ORUÇ[a], Gülden ATAN[b]

[a]Doç Dr., Giresun Üniversitesi Sağlık Bilimleri Fakültesi, İç Hastalıkları Hemşireliği Anabilim Dalı, Giresun, Türkiye

[b]Doç. Dr., Van Yüzüncü Yıl Üniversitesi Sağlık Bilimleri Fakültesi, İç Hastalıkları Hemşireliği Anabilim Dalı, Van, Türkiye

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ABSTRACT

Objective: The aim of this study was to evaluate the relationships between nomophobia and problematic internet use with demographic data (gender, age, grades/academic year, telephone usage starting age, daily phone usage time, reason for common use of the telephone) and to assess the effect of nomophobia on problematic internet use in nursing students.

Methods: The study was conducted in a cross-sectional and descriptive manner with 392 students studying in the nursing departments of two state universities located in the north and east of Turkey. Data for the study were collected between June and July 2024, with the aim of encompassing the entire population, without employing any sampling techniques. Descriptive Information Form, Nomophobia Scale and Problematic Internet Use Scale were used for data collection. In the evaluation of the data, t-test, ANOVA (posthoc Bonferroni) and linear regression analyses were used.

Results: It was found that 78.1% of the participants were female and 75.8% had started using a mobile phone between the ages of 14 and 18. In addition, nomophobia had a positive ($b = 0.360$) and significant ($p < 0.001$) effect on problematic internet use, explaining 8.9% of the variance in problematic internet use ($R^2 = 0.089$).

Conclusion: These findings highlight that nomophobia is an important factor contributing to problematic internet use among nursing students and emphasize the need for preventive strategies aimed at reducing the risk of problematic internet use.

Keywords: Smartphone, Nursing Student, Nomophobia, Problematic Internet Use

ÖZ

Amaç: Bu çalışmanın amacı, demografik verilerle (cinsiyet, yaş, sınıf/akademik yıl, telefon kullanmaya başlama yaşı, günlük telefon kullanım süresi ve telefonun en yaygın kullanım nedeni nomofobi ve problemli internet kullanımı arasındaki ilişkiyi ölçmek ve nomofobinin hemşirelik öğrencilerinde problemli internet kullanımı üzerindeki etkisini değerlendirmektir.

Yöntem: Çalışma, Türkiye'nin kuzeyinde ve doğusunda bulunan iki devlet üniversitesinin hemşirelik bölümlerinde öğrenim gören 392 öğrenci ile kesitsel ve tanımlayıcı bir şekilde yürütüldü. Araştırma verileri, herhangi bir örnekleme yöntemine gidilmeden, evrenin tamamına ulaşılması hedeflenerek Haziran-Temmuz 2024 tarih aralığında toplandı. Veri toplamada Tanımlayıcı Bilgi Formu, Nomofobi Ölçeği ve Problemli İnternet Kullanım Ölçeği kullanıldı. Verilerin değerlendirilmesinde t-testi, ANOVA (posthoc Bonferroni) ve doğrusal regresyon analizleri kullanıldı.

Bulgular: Katılımcıların %78,1'inin kadın olduğu, %75,8'inin 14-18 yaşları arasında cep telefonu kullanmaya başladığı belirlendi. Ayrıca nomofobinin, problemli internet kullanımını pozitif (b=0,360) ve anlamlı (p<0,001) şekilde etkilediği, problemli internet kullanımındaki varyansın %8,9'unu açıkladığı bulundu (R^2=0,089).

Sonuç: Bu bulgular, nomofobinin hemşirelik öğrencileri arasında problemli internet kullanımına katkıda bulunan önemli bir faktör olduğunu ve problemli internet kullanımı riskini azaltmaya yönelik önleyici stratejilerin gerekliliğini vurgulamaktadır.

Anahtar Kelimeler: Akıllı Telefon, Hemşirelik Öğrencisi, Nomofobi, Problemli İnternet Kullanımı

ORCID IDs: FGO: 0000-0003-3650-1926, GA: 0000-0001-8816-9537
Sorumlu yazar/Corresponding author: Doç. Dr. Fatma GÜNDÜZ ORUÇ, Giresun Üniversitesi, Sağlık Bilimleri Fakültesi, İç Hastalıkları Hemşireliği AD, Giresun, Türkiye
e-posta/e-mail: fatmagunduz2325@gmail.com
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INTRODUCTION

The rapid advancement of technology has significantly influenced our daily activities and behaviors. Mobile phones, as tools of information and communication technology, have undergone substantial changes in recent years and have become an essential part of daily life (Bekaroğlu & Yilmaz, 2020). Among the reasons for this are that mobile phones facilitate communication technologies, offer services such as flexibility, mobility, and personalization to users, simplify daily life, enable users to call for help when needed, and allow for location tracking (King et al., 2010). While it is known that technological advancements have facilitating effects on social life, it is also acknowledged that their negative aspects should be taken into consideration (Baltacı et al., 2021). Mobile phones, which are widely and frequently used by most people, can lead to certain emotional and behavioral disorders. One of these disorders is nomophobia. Nomophobia, derived from the term "no mobile phobia," can be described in our language as the fear of being without a mobile phone (King et al., 2014). Nomophobia was first defined by King et al. (2010) as a disorder of the 21st century related to agoraphobia and panic disorder, characterized by the discomfort and anxiety felt when one is away from their mobile phone or computer.

Individuals with nomophobia tend to constantly check their phones psychologically, frequently inspect whether they have received any messages or calls and exhibit excessive nervous behavior in areas with limited or no coverage. Moreover, these individuals often go to bed with their smartphones or keep their smartphones on 24 hours a day (Bragazzi & Del Puente, 2014). Studies have reported that students who have had their smartphones taken away experience increased levels of stress and anxiety over time, and a deterioration in verbal communication (Cheever et al., 2014; Kahyaoğlu Süt et al., 2016). Researches have revealed that individuals exhibiting nomophobic traits are unable to forgo the virtual environment, which leads to disruptions in their daily routines and a lack of control over the time they spend online (Bekaroğlu & Yilmaz, 2020; Güler & Veysikarani, 2019). Therefore, excessive use of smartphones, which are highly convenient for humans, can lead to physical and psychological problems (Güler & Veysikarani, 2019).

Problematic Internet Use (PIU) is defined as the condition where individuals experience difficulties in controlling their internet usage, have intense cognitive preoccupation with the internet, and exhibit various reactions such as anger, restlessness, and irritability when they cannot access the internet, which adversely affects their occupational, academic, physical, psychological, and social lives (Baltacı et al., 2021). Excessive time spent on the internet, difficulties in controlling internet use, and the lack of necessary skills for healthy internet use can lead to PIU (Avşaroğlu & Akbulut, 2022). As a result, individuals' physical, psychological, and social lives can be negatively impacted. A study conducted with university students reported that PIU disrupts stress management and leads to a decline in academic performance (Nazik & Güneş, 2019). Various studies have shown that PIU is associated with physical, psychological, and social problems such as obesity (Budak et al., 2015), eating addiction (Tao & Liu, 2009), decreased physical activity (Mota et al., 2006), academic failure (Xin et al., 2018), academic procrastination (Geng et al., 2018), negative school experiences (Li GuangMing et al., 2019), negative mental health symptoms (Özcan et al., 2020) and unhealthy family relationships (Chi et al., 2020).

Among nursing students, it is anticipated that digital addiction may cause problems, especially when fulfilling responsibilities related to care and treatment. Studies have indicated that internet addiction and nomophobia lead to distraction among healthcare personnel, negatively affecting the quality of care and posing a risk to patient safety (Gutiérrez-Puertas et al., 2019; Junco, 2012; Katz-Sidlow et al., 2012). This risk is also significant in terms of the potential to harm the principles of patient privacy and the confidentiality of personal data (Alsos et al., 2012; Barton, 2012). The literature reveals numerous studies investigating the impact of nomophobia and PIU on different groups. Despite its importance, studies on this topic

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among nursing students are limited. Therefore, the aim of this study is to examine the relationship between nomophobia and PIU with demographic data and the effect of PIU on nomophobia in nursing students.

Research Questions

- What is the level of nomophobia among nursing students?
- What is the level of problematic internet use among nursing students?
- Does nomophobia predict problematic internet use?
- Do nomophobia and problematic internet use differ according to individual characteristics?

METHODS

Research Design

The research was planned as a descriptive, correlational and cross-sectional study.

Population and Sample

The study was conducted with nursing students from two state universities located in the northern (Giresun University, n = 372) and eastern (Van Yüzüncü Yıl University, n = 480) regions of Turkey, with data collection carried out between June and July 2024. The study population consisted of a total of 852 students from both universities. Based on the study by Nasab et al. (2021) (mean NMP score: 70.66 ± 8.26), a minimum sample size of 205 was calculated using G*Power 3.1.9.4 for a two-tailed independent samples t-test with an effect size of d = 0.231, α = 0.05, and power = 0.80 (95% confidence interval). Given that the study population was known and limited, this calculation was further supported by finite population sampling methods to ensure representativeness. According to the inclusion criteria, all students aged 18–35 who could speak and understand Turkish, had no communication barriers, and were willing to participate were included in the study. The final sample size reached was 392, exceeding the minimum requirement and ensuring adequate statistical power.

Data Collection Tools

In the collection of data, a descriptive information form including information about the participants in line with the relevant literature (Çakmakcı & Öner, 2022; Çelik İnce, 2021), NMP-Q and PIUS were used.

Desciptive Information Form: The Descriptive Information Form was prepared by the researcher in line with the relevant literature (Çakmakcı & Öner, 2022; Çelik İnce, 2021) and the form included 6 questions to determine the demographic and telephone usage characteristics of the participants.

Nomophobia Scale (NMP-Q): The 20-item NMP-Q developed by Yildirim and Correia and prepared in the form of 7-point Likert was used to measure students' smartphone addiction (Yildirim & Correia, 2015). In the study conducted by Yildirim and Correia, it was stated that there are 4 sub-dimensions related to the nomophobic status of individuals. These were expressed as not being able to access information, losing connectedness, not being able to communicate, and giving up convenience. In the study conducted by Yildirim and Correia, the reliability value (Cronbach alpha) of the scale was calculated as 0.95. The scale was adapted into Turkish by Yildirim and Correia and the reliability value of the scale was calculated as 0.92. The scores that can be obtained from the scale are between 20-140. As an evaluation criterion, if the average score obtained from the scale is 20 points and below, it is interpreted as no nomophobia, if between 20-60 points, it is interpreted

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as low level nomophobia, if between 60-100 points, it is interpreted as moderate nomophobia, and if 100 points and above, it is interpreted as severe nomophobia (Yildirim & Correia, 2015). The reliability coefficient (Cronbach's alpha) of the scale in this study was determined to be 0.94.

Problematic Internet Use Scale (PIUS): PIUS was developed by Ceyhan and colleagues in 2007. The reliability coefficient of the scale is 0.81. The scale consists of three factors: negative consequences of the internet use, social benefit/comfort, and excessive use of the internet. High scores on the scale are interpreted as an indication that individuals' internet use has become unhealthy, negatively affecting their lives, and potentially leading to addictive behaviors. The PIUS is a 33-item, five-point Likert-type scale with response options "completely appropriate (5 points)," "quite appropriate (4 points)," "somewhat appropriate (3 points)," "rarely appropriate (2 points)," and "not appropriate at all (1 point)" (Ceyhan et al., 2007). The reliability coefficient (Cronbach's alpha) of the scale in this study was determined to be 0.97.

Data Analysis

Data were analyzed using SPSS version 22.0. Descriptive statistics including mean, standard deviation, frequency, and percentage were calculated for participants' demographic characteristics, phone usage patterns, and scale scores. The normality and homogeneity of variances were assessed using Levene's test. Independent samples t-tests and one-way analysis of variance (ANOVA) with post hoc Hochberg GT2 tests were conducted to examine differences in NMP-Q and PIUS scores based on gender, age group, grade level, age of starting phone use, and daily phone usage duration. Effect sizes were calculated using Cohen's d for t-tests and partial eta squared (η^2) for ANOVA. Simple linear regression analysis was performed to evaluate the effect of total nomophobia scores on problematic internet use. Additionally, multiple linear regression analysis was conducted to determine the impact of NMP-Q sub-dimensions (not being able to access information, giving up convenience, not being able to communicate, and losing connectedness) on problematic internet use. Statistical significance was set at $p<0.05$. The Durbin-Watson statistic was examined to assess autocorrelation in regression residuals.

Ethical Considerations

Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Medicine at Van Yüzüncü Yıl University (Date: 11.08.2023, Approval number: 2023/08-05). All participants provided written informed consent during face-to-face interviews. The consent form explained the study's purpose and data collection procedures. The study was conducted in accordance with the Helsinki Declaration on Human Rights.

RESULTS

Participant Characteristics

This study was conducted with the participation of a total of 392 students. Of the participants, 78.1% were female, aged between 18 and 25, with an average age of 19.85±1.18 and a median age of 20. It was determined that 49.2% of the students were in the 20-21 age range, 61.5% were second-year students, 75.8% started using a phone between the ages of 14 and 18, 38.3% used their phones for 3-5 hours daily, and 50.8% primarily used their phones to connect to social networks (Table 1).

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Table 1. Descriptive Findings on Participants' Demographic and Telephone Usage Characteristics

Variables	n	%
Gender		
Female	306	78.1
Male	86	21.9
Age Group		
18-19 years old	164	41.8
20-21 years old	193	49.2
22-25 years old	35	8.9
Grades		
Grade 1	64	16.3
Grade 2	241	61.5
Grade 3	52	13.3
Grade 4	35	8.9
Telephone Usage Starting Age		
Under 14 years old	56	14.3
14-18 years old	297	75.8
19 years and over	39	9.9
Daily Phone Usage Time		
Less than 1 hour	21	5.4
2-3 hours	88	22.4
3-5 hours	150	38.3
Over 5 hours	133	33.9
Reason for Common Use of the Telephone		
Social networks	199	50.8
Listening to music and watching films	80	20.4
Messaging	47	12.0
Internet searches	31	7.9
Telephone calls	18	4.6
Playing games	7	1.8
Other causes	10	2.6

n: Frequency; %: Percentage

The participants exhibited a moderate level of nomophobia, with a mean NMP-Q score of 75.95 ± 25.26. Among the sub-dimensions, the highest scores were observed in not being able to communicate (25.64 ± 9.82) and giving up convenience (18.66 ± 7.75). Similarly, problematic internet use was moderate, with a mean PIUS score of 89.09 ± 30.44, and the negative consequences sub-dimension showed notably higher scores (44.26 ± 18.89) compared to others (Table 2).

Table 2. Descriptive Statistics of Scale Scores

Score (N=392)	Min.	Max.	$\bar{x}$	SD
NMP-Q	20.00	140.00	75.95	25.26
Not being able to access information	4.00	28.00	16.89	6.06
Giving up convenience	5.00	35.00	18.66	7.75
Not being able to communicate	6.00	42.00	25.64	9.82
Losing connectedness	5.00	35.00	14.77	7.79
PIUS	33.00	162.00	89.09	30.44
Excessive use of the internet	6.00	30.00	18.88	4.67
Social benefit/comfort	10.00	50.00	25.95	10.73
Negative consequences of the internet use	17.00	85.00	44.26	18.89

$\bar{x}$: Mean; SD: Standard Deviation; Min: Minimum; Max: Maximum; NMP-Q: Nomophobia Scale; PIUS: Problematic Internet Use Scale

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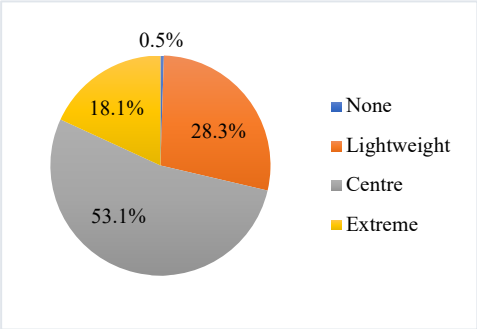


Figure 1. Nomophobia Levels of Participants

Furthermore, based on the evaluation according to the NMP-Q cut-off scores, it was determined that 0.5% of the participants did not exhibit any signs of nomophobia, while 28.3% had lightweight, 53.1% had centre, and 18.1% had extreme nomophobia (Figure 1).

Examination of Nomophobia and Problematic Internet Use Scores Based on Various Characteristics

To examine the NMP-Q and PIUS scores according to gender, age group, class level, age of starting phone use, and daily phone usage duration, independent samples t-tests or one-way analysis of variance (ANOVA) were performed, and the findings are presented in Table 3.

Accordingly, there were no significant differences in the participants' nomophobia and PIUS scores based on gender ($p>0.05$). However, in the not being able to communicate sub-dimension of the NMP-Q, females' scores were significantly higher, and in the negative consequences of the internet use sub-dimension of the PIUS, males' scores were significantly higher ($p<0.05$; $d=0.3$).

There were no significant differences in the participants' NMP-Q and PIUS scores based on the class level ($p>0.05$). However, a significant difference was observed in the social benefit/comfort sub-dimension of the PIUS ($p<0.05$; $d=0.02$). To determine between which groups the differences existed, the Hochberg GT2 multiple comparison (post-hoc) test was performed. It was found that third-year students' scores were significantly higher than those of first- and second-year students (Table 3).

The participants' NMP-Q scores did not show significant differences based on the age of starting phone use ($p>0.05$). However, a significant difference was found in the giving up convenience sub-dimension ($p<0.05$; $\eta^2=0.02$). To identify the groups between which the differences existed, the Hochberg GT2 multiple comparison (post-hoc) test was conducted, and it was found that those who started using a phone before the age of 14 had significantly higher scores than those who started between the ages of 14 and 18 (Table 3).

On the other hand, significant differences were found in the PIUS scores and the social benefit/comfort ($\eta^2=0.01$) and negative consequences of the internet use sub-dimensions based on the age of starting phone use ($p<0.01$; $\eta^2=0.06$). The Hochberg GT2 multiple comparison (post-hoc) test was conducted to identify the groups between which the differences existed, revealing that those who started using a phone before the age of 14 had significantly higher scores than those who started at later ages (Table 3).

The participants' NMP-Q and PIUS scores, including the sub-dimensions, showed significant differences based on daily phone usage duration ($p<0.05$; $\eta^2=0.06$). Those who used their phones for more than 5 hours a day had significantly

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higher NMP-Q and PIUS scores than those who used them for up to 3 hours ($p<0.01$, $p<0.05$). A similar situation was observed in the not being able to access information and giving up convenience sub- dimensions. However, in the not being able to communicate, losing connectedness, social benefit/comfort, and negative consequences of the internet sub-dimensions, those who used their phones for more than 3 hours had significantly higher scores than those who used them for less than 1 hour. Additionally, in the excessive use sub-dimension, those who used their phones for 2 hours or more had significantly higher scores than those who used them for less than 1 hour (Table 3).

Table 3. Examination of Nomophobia and Problematic Internet Use Scores According to Descriptive Characteristics

Variable	NMP-Q Total	Not being able to access information	Giving up convenience	Not being able to communicate	Losing connectedness	PIUS Total	Excessive use of the internet	Social benefit/comfort	Negative consequences of the internet use
					$\bar{x}$± SD				
Gender									
Female	76.81±24.60	16.80±6.06	18.90±7.54	26.23±9.65	14.88±7.77	87.57±30.68	18.93±4.69	25.42±10.87	43.22±19.03
Male	72.92±27.40	17.21±6.06	17.80±8.48	23.53±10.17	14.37±7.91	94.49±29.11	18.70±4.60	27.84±10.04	47.95±18.02
t	1.262	-0.557	1.155	2.263	0.536	-1.868	0.404	-1.848	-2.062
p	0.208	0.578	0.249	**0.024**	0.592	0.063	0.686	0.065	**0.040**
d				0.28					0.25
Age Group									
18-19 years old	78.34±23.77	17.43±5.78	19.04±7.57	26.66±9.50	15.21±7.65	89.38±29.57	18.74±4.78	26.00±10.11	44.64±18.56
20-21 years old	74.54±26.13	16.49±6.20	18.51±7.95	25.15±10.08	14.39±7.86	88.12±31.33	19.01±4.64	25.51±11.26	43.60±19.30
22-25 years old	72.60±26.85	16.51±6.49	17.69±7.62	23.60±9.53	14.80±8.22	93.09±29.98	18.80±4.37	28.20±10.54	46.09±18.48
F	1.343	1.143	0.506	1.893	0.482	0.406	0.156	0.935	0.313
p	0.262	0.320	0.604	0.152	0.618	0.667	0.856	0.393	0.731
Grades									
Grade 1	79.34±27.76	17.13±6.25	19.75±9.19	26.58±11.00	15.89±8.43	85.58±28.01	19.41±4.20	24.66±9.90	41.52±16.41
Grade 2	76.37±24.26	17.09±5.95	18.86±7.41	25.95±9.53	14.48±7.38	88.78±30.40	18.91±4.76	25.54±10.63	44.32±19.24
Grade 3	70.00±26.06	15.17±5.55	16.56±7.28	24.06±9.65	14.21±8.44	98.12±34.40	18.58±4.63	30.00±12.12	49.54±21.08
Grade 4	75.71±25.71	17.63±6.92	18.37±7.62	24.14±9.75	15.57±8.42	84.26±27.06	18.11±4.92	25.14±9.67	41.00±16.07
F	1.375	1.692	1.775	0.997	0.765	2.128	0.661	3.008	2.171
p	0.250	0.168	0.151	0.394	0.514	0.096	0.577	**0.030**	0.091
η^2								0.02	
Difference								3>1,2	
Telephone Usage Starting Age									
<14[a]	82.16±26.40	17.86±6.14	21.07±7.94	27.89±10.24	15.34±8.09	101.39±29.68	18.54±4.43	29.96±11.02	52.89±19.85
14-18[b]	74.35±24.87	16.65±6.06	18.07±7.68	25.16±9.62	14.47±7.64	87.25±30.23	18.84±4.70	25.45±10.64	42.97±18.41
≥19[c]	79.23±25.48	17.28±5.93	19.64±7.48	26.08±10.43	16.23±8.48	85.41±29.59	19.67±4.78	24.05±9.83	41.69±18.23
F	2.637	1.023	3.936	1.880	1.053	5.524	0.717	4.955	7.120
p	0.073	0.361	**0.020**	0.154	0.350	**0.004**	0.489	**0.007**	**<0.001**
η^2			0.02			0.03		0.02	0.04
Difference			a>b			a>b,c		a>b,c	a>b,c

$\bar{x}$: Mean; SD: Standard Deviation; $p<0.005$; t = independent groups t test; F: one-way ANOVA test; NMP-Q: Nomophobia Scale; PIUS: Problematic Internet Use Scale

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Table 3. Examination of Nomophobia and Problematic Internet Use Scores According to Descriptive Characteristics *(Continued)*

Daily Phone Usage Time (Hours)									
<1[a]	56.10±23.33	13.48±6.77	12.81±6.80	18.95±8.98	10.86±5.82	66.52±29.96	14.90±4.91	19.52±10.00	32.10±17.04
2-3[b]	71.52±23.43	15.52±5.91	17.33±7.28	24.98±9.42	13.69±6.84	84.43±32.44	17.82±4.10	24.70±11.32	41.91±20.17
3-5[c]	76.59±25.07	17.05±5.88	18.76±7.41	25.99±9.87	14.79±8.26	89.34±29.74	19.05±4.59	25.68±10.55	44.61±18.57
>5[d]	81.30±25.12	18.14±5.91	20.34±8.05	26.74±9.79	16.08±7.88	95.45±27.94	20.01±4.63	28.11±10.16	47.34±17.86
F	7.617	5.862	7.267	4.097	3.655	6.759	9.887	4.868	4.679
p	**<0.001**	**<0.001**	**<0.001**	**0.007**	**0.003***	**<0.001**	**<0.001**	**0.002**	**0.003**
η^2	0.06	0.04	0.05	0.03	0.03	0.05	0.07	0.04	0.03
Difference	d>a,b	d>a,b	d>a,b	c,d>a	c,d>a	d>a,b	b,c,d>a	c,d>a	c,d>a

p<0.005; t = independent groups t test; F: one-way ANOVA test; NMP-Q: Nomophobia Scale; PIUS: Problematic Internet Use Scale

The Impact of Nomophobia on Problematic Internet Use

Firstly, simple linear regression findings regarding the effect of nomophobia on problematic internet use are given in Table 4.

As seen in Table 4, nomophobia has a positive (b=0.360) and significant (p<0.001) effect on problematic internet use. Nomophobia explains 8.9% of problematic internet use. In addition, problematic internet use increases by 0.360 points with 1 point increase in nomophobia.

Table 4. The Effect of Nomophobia on Problematic Internet Use

Dependent Variable	**Independent Variable**	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**p**
		b	**S. E.**	**β**		
Problematic internet usage	(Constant)	61.738	4.661		13.245	<0.001
	Nomophobia	0.360	0.058	0.299	6.183	**<0.001**

S.E: Standard error; β: Standardized regression coefficient; t = independent groups t test; R^2: coefficient of determination; F(1-390)=38.230; p<0.001; R^2=0.089; Durbin-Watson=1.632

In Table 5, the multiple linear regression findings regarding the impact of the sub-dimensions of nomophobia on problematic internet use are presented. As seen in Table 5, it was determined that the sub-dimensions of nomophobia, namely, giving up convenience and losing connectedness, positively (b=0.677 and b=0.792, respectively) and significantly (p<0.05) affected problematic internet use. Problematic internet use increases by 0.677 points with 1 point increase in giving up convenience and increases by 0.792 points with 1 point increase in losing connectedness. Not being able to access information and not being able to communicate do not have significant effects on problematic internet use (p>0.05).

Table 5. The Effect of Nomophobia Sub-Dimensions on Problematic Internet Use

Dependent Variable	**Independent Variables**	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**p**	**VIF**
		b	**S. E.**	**β**			
Problematic internet usage	(Constant)	66.432	5.044		13.171	<0.001	
	Not being able to access information	-0.064	0.284	-0.013	-0.226	0.821	1.387
	Giving up convenience	0.677	0.270	0.172	2.509	**0.013**	2.046
	Not being able to communicate	-0.023	0.198	-0.007	-0.116	0.908	1.769
	Losing connectedness	0.792	0.257	0.203	3.086	**0.002**	1.870

*Adj. R^2: Adjusted R-squared; VIF: Variance inflation factor; S.E.: Standard error; β: Standardized regression coefficient; F(4-387)=11.493; p<0.001; Adj. R^2=0.097; Durbin-Watson=1.597

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DISCUSSION

In this section, the differences between the scores obtained from NMP-Q and PIUS and the descriptive characteristics of the participants and the effect levels of the scales on each other were discussed in line with the relevant literature.

Participant Characteristics

In the study, the majority of the students stated that they used smartphones for 3-5 hours daily. While this period was mostly 4-6 hours in the study conducted by Atalıkoğlu Başkan et al. 2023, this period was determined as 5-6 hours in the studies conducted by Çakmakcı & Öner (2022) and Copaja-Corzo et al. (2022). In the study conducted by Çelik İnce (2021), while the majority of the students stated that they use the phone for 2-3 hours daily, a significant number of them stated this period as 5-7 hours. As can be seen, the daily phone usage time among university students is similar. The NMP-Q and PIUS scores of those who used their phones for more than 5 hours during the day were found to be significantly higher than those who used their phones for up to 3 hours. In the literature, there are different studies showing that as the daily phone usage time increases, the level of nomophobia also increases (Çakmakcı & Öner, 2022; Gezgin & Çakır, 2016; Yildirim & Correia, 2015). Today, in parallel with technological developments, it is thought that the time spent by young people on the phone has increased due to activities such as communication, access to information, shopping, and use of social networks.

In our study, the majority of nursing students stated that they mostly used mobile phones to connect to social networks. Similar to our study, Gonçalves et al. (2020) and Atalıkoğlu Başkan et al. (2023) found that most of the students used their phones to use social networks in their studies. In the study conducted by Çelik İnce (2021), while the majority of the students stated that they used their phones to communicate with their family and friends, almost a majority of them stated that they looked at their phones for social media use. The point reached by technology and the popularity of online communication networks make this result obtained from the study inevitable.

Our study revealed that more than half of the nursing students had moderate NMP. In different studies conducted in Turkey and Peru, moderate nomophobia was found in the majority (Çakmakcı & Öner, 2022; Copaja-Corzo et al., 2022). In a study conducted in Spain, (Tárrega-Piquer et al., 2023) a low level of nomophobia was found in the majority of participants, while in a study conducted with nursing students in Egypt (El-Ashry et al., 2024), it was found that the majority reported a high level of nomophobia. Gutiérrez-Puertas et al. (2019) found that Spanish and Portuguese nursing students' NMP scores were above average. In different studies conducted with nursing students, more than half of the participants had moderate levels of NMP (Al-Mamun et al., 2023; Molu et al., 2023). In a recent meta-analysis, 13 out of 20 research articles from 10 countries reported a prevalence rate of 70% for moderate to severe NMP, highlighting the alarming rise of NMP as a public health problem despite varying rates across countries (Awed & Hammad, 2022). These results are not surprising as we rapidly move towards the digital age.

Examination of Nomophobia and Problematic Internet Use Scores Based on Various Characteristics

A significant difference was observed in the inability to communicate sub-dimension of NMP in females compared to males. When the literature is examined, there are studies supporting that females are more nomophobic than males (Gutiérrez-Puertas et al., 2019; Yildirim & Correia, 2015). In this respect, our research result is similar to the literature. In addition, studies have also been found that there is no difference between the nomophobia levels of males and females (Apak & Yaman, 2019; Sanjay Dixit et al., 2010; Yıldız et al., 2020). The fact that women's feelings such as anxiety about being informed, anxiety, and curiosity are more dominant may be a factor in the emergence of the result in our study.

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The finding that individuals who begin using mobile phones before the age of 14 exhibit nomophobic behaviors is further supported by recent studies conducted in Türkiye. For instance, research on high school students revealed that nearly half demonstrated moderate levels of nomophobia, while 15% experienced severe levels; moreover, using smartphones for more than two hours per day was found to significantly exacerbate these behaviors (Terzi et al., 2024). In addition, adolescents' nomophobia levels were shown to be positively associated with their mothers' nomophobic tendencies, highlighting the critical role of parental modeling within the family context (Çelik & Alan, 2023). These findings underscore the importance of family-centered intervention programs, particularly in the Turkish context. International research further supports these observations: in Vietnam, the prevalence of nomophobia among high school students reached an alarming 99.9%, with severe nomophobia negatively correlated with academic achievement (Nguyen et al., 2024). A systematic review also confirmed that nomophobia undermines not only academic performance but also sleep regulation, attention, and psychological well-being, thereby disrupting students' educational trajectories (Janatolmakan et al., 2024). In the aftermath of the COVID-19 pandemic, problematic internet use has risen to over 40% among adolescents, with female students particularly at risk (Burkauskas et al., 2022). Furthermore, neuroimaging evidence indicates that internet addiction alters functional brain connectivity in adolescents, producing negative effects on attention, learning, and mental health (Chang & Lee, 2024). Taken together, these findings suggest that intervention programs in Türkiye should extend beyond individual awareness and incorporate multi-level strategies at the family, school, and community levels to effectively address nomophobia and problematic internet use.

In our study, it was observed that the majority of the participants had a moderate level of problematic internet use (53%). In a study conducted in India, moderate level of PIU was found among university students (Jose et al., 2024). In a large-scale study conducted in Spain with 41,500 adolescents, the prevalence of problematic internet use (PIU) was reported to be 33% (Pérez-Sáenz et al., 2023). In Turkey, pre-pandemic data are limited; however, recent studies have reported problematic internet use ranging from 12% to 21% (Kamaşak et al., 2022). A meta-analysis conducted in India indicated that among school-aged adolescents, moderate-to-severe PIU was 21.5%, while severe use accounted for 2.6% (Joseph et al., 2022). Furthermore, global systematic reviews have reported that the average prevalence of PIU among adolescents is 13.1%, whereas problematic smartphone use reaches 23.3% (Loladze, 2020). In contrast, Kanu (2025) reported a prevalence of 62.6%, noting that female students were particularly at higher risk (Kanu et al., 2025). In different studies conducted in Turkey, the PIU rate varies between 13-25% (Çam & Karasu, 2022). Cultural differences of countries and differences in educational opportunities may affect these results.

A significant difference was observed in the problematic internet use of males in terms of the negative consequences of the internet sub-dimension compared to females. In a cross-cultural study, gender differences in PIU rates were associated with the environment of internet introduction (Li & Kirkup, 2007). Accordingly, gender differences in those who meet the internet in the home environment are more prominent than those who meet in the educational environment. Lee et al. (2018) found that the use of smartphones among men, especially for video, music or games, was significantly associated with problematic behaviors. In the same study, women's use of smartphones, especially for social media applications, chatting or messaging, was significantly associated with PIU. Similarly, Chen et al. (2017) found that the use of gaming applications in men was significantly associated with PIU, while the use of social networking sites and multimedia applications in women was significantly associated with PIU. In the results obtained from our study, it is thought that the variability of internet use preferences between genders has an important role in the result. It is thought that there is a need for comprehensive studies on the reasons for gender differences in PIU in Türkiye.

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In 3rd grade nursing students, problematic internet use showed a significant difference in terms of social benefit compared to 1st and 2nd grade levels. A study has shown that the strongest determinant of PIU is the need for communication (Çam & Karasu, 2022). This may be due to the increase in socialization anxiety towards the end of the university years and the increase in their need for the internet with the intensification of their time in the clinical environment in nursing education.

The Impact of Nomophobia on Problematic Internet Use

In our study, nomophobia was found to increase the level of problematic internet use. Especially in terms of giving up convenience and losing connectedness, the participants were found to be more prone to PIU. Pavithra et al. (2015) and Bıvın et al. (2013) revealed in their studies that individuals with high PIU levels also had high levels of nomophobia. Ayar et al. (2018) found that high nomophobia was responsible for 19% of the high PIU level. The results obtained from our study are similar to the literature.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between nomophobia and problematic internet use. Second, the data were collected using self-reported questionnaires, which may be subject to social desirability and recall biases. Third, the sample was drawn from nursing students in only two state universities in Turkey, which may limit the generalizability of the results to students from other regions, fields of study, or countries.

CONCLUSION

The findings of this study indicate that nursing students generally exhibit moderate levels of both nomophobia and problematic internet use. Participants who started using mobile phones before the age of 14 and those with longer daily phone usage durations showed significantly higher scores on both scales, highlighting early exposure and extended use as risk factors. Gender differences were observed in certain sub-dimensions, with females reporting higher scores in the inability to communicate sub-dimension of nomophobia and males showing higher scores in the negative consequences of internet use sub-dimension. Moreover, regression analyses demonstrated that nomophobia positively and significantly affects problematic internet use, with the sub-dimensions of giving up convenience and losing connectedness being the strongest predictors. These results emphasize the intertwined nature of smartphone dependence and unhealthy internet behaviors among nursing students.

Given the increasing integration of technology in academic and social life, these findings underscore the importance of targeted intervention programs. Family-centered education, digital literacy training, and awareness-raising initiatives at the university level may help mitigate the negative effects of nomophobia and problematic internet use. Future research should consider longitudinal designs and incorporate psychological, social, and environmental factors to better understand the underlying mechanisms and develop effective prevention strategies.

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