Determinants of nomophobia and its relationship with loneliness in adolescents: A cross-sectional study

Adölesanlarda nomofobinin belirleyicileri ve yalnızlıkla ilişkisi: Kesitsel bir çalışma

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ABSTRACT

Aim: This study was conducted to examine the determinants of nomophobia and its relationship with loneliness among adolescents.

Method: This cross-sectional study was conducted with 506 adolescents in four high schools in a province in the Western Black Sea Region of Türkiye between February 10 and April 14, 2025.

Results: The ages of the adolescents who participated in the study ranged from 14 to 17 years. The mean score (SD) on the Nomophobia Scale for the Nine-to-Eighteen Age Group was 70.20 (23.01) and the mean score (SD) on the UCLA Loneliness Scale was 14.91 (3.98). A significant positive correlation was found between loneliness and the total nomophobia score (r=0.264, p=0.000). According to the results of the multiple linear regression analysis, younger age, female gender, longer duration of phone use, having more friends on social media than in real life, the habit of checking the phone first thing in the morning, and a high sense of loneliness were identified as significant factors contributing to increased levels of nomophobia (F=17.473, p=0.000, R²=0.246).

Conclusion: This study shows that the level of nomophobia in adolescents is significantly related to loneliness as well as individual (age, gender, phone usage) and social factors (number of social media friends, social habits), emphasizing the importance of addressing these dimensions together in the fight against digital addiction. To redefine adolescents' relationship with digital devices, social awareness campaigns and educational programs should highlight the decisive role that modifiable factors such as phone usage habits and loneliness play in the development of nomophobia.

Keywords: adolescents; loneliness; smartphone; youth

ÖZ

Amaç: Bu çalışma, adolesanlarda nomofobinin belirleyicilerini ve yalnızlık ile ilişkisini incelemek amacıyla gerçekleştirilmiştir.

Yöntem: Kesitsel tipteki bu çalışma, 10 Şubat – 14 Nisan 2025 tarihleri arasında Türkiye'nin Batı Karadeniz Bölgesi'ndeki bir ilin dört farklı lisesinde öğrenim gören 506 ergen ile gerçekleştirilmiştir.

Bulgular: Çalışmaya katılan adölesanların yaşları 14 ile 17 arasında değişmektedir. Dokuz-On Sekiz Yaş İçin Nomofobi Ölçeği ortalama puan (SS) 70.20 (23.01), UCLA Yalnızlık Ölçeği'nden alınan ortalama puan (SS) ise 14.91 (3.98) olarak bulunmuştur. Yalnızlık ile toplam nomofobi puanı arasında anlamlı ve pozitif yönde bir korelasyon saptanmıştır (r=0.264, p=0.000). Çoklu doğrusal regresyon analizi sonuçlarına göre; daha genç yaşta olmak, kadın cinsiyet, telefon kullanım süresinin uzun olması, gerçek hayatta olduğundan daha fazla sosyal medya arkadaşına sahip olmak, sabah uyanır uyanmaz telefonu kontrol etme alışkanlığı ve yüksek yalnızlık hissi, nomofobi düzeyinin artmasına anlamlı düzeyde katkı sağlayan faktörler olarak belirlenmiştir (F = 17.473, p=0.000, R² = 0.246).

Sonuçlar: Bu çalışma, adolesanlarda nomofobi düzeyinin yalnızlık ile birlikte bireysel (yaş, cinsiyet, telefon kullanımı) ve sosyal etkenler (sosyal medya arkadaş sayısı, sosyal alışkanlıklar) ile anlamlı şekilde ilişkili olduğunu göstererek, dijital bağımlılıkla mücadelede bu boyutların birlikte ele alınmasının önemini vurgulamaktadır. Adölesanların dijital cihazlarla olan ilişkisini yeniden yapılandırmak için, sosyal farkındalık kampanyaları ve eğitim programlarında, telefon kullanım alışkanlıkları ve yalnızlık gibi değiştirilebilir faktörlerin nomofobi gelişiminde belirleyici rol oynadığına dikkat çekilmelidir.

Anahtar kelimeler: adölesan; akıllı telefon; gençlik; yalnızlık

Introduction

With the changing world order and globalization, the importance given to the internet, computers, smartphones, tablets and other technological tools is increasing (Tomczyk & Lizde, 2022). Phones, which are one of the most important parts of technological tools, were initially used only for communication, but today they are used for many online activities such as sending and receiving e-mails, chatting with others, connecting to social media applications, watching and uploading videos (Ayar et al., 2018; Buctot et al., 2020). With increasing digital interaction, this situation has made smartphones an integral part of daily life (Buctot et al., 2020).

A review of the literature reveals that smartphone use is quite prevalent among adolescents. In a study involving 670 students, 49% of participants reported using their smartphones for 3–5 hours per day, while 15% reported using them for 6–8 hours per day (Çiçek et al., 2021). These findings indicate that adolescents spend a considerable amount of time using digital devices. Similarly, in another study conducted on adolescents, the average total score for smartphone addiction was found to be 28.93 ± 12.61, which was considered to be high (Şanlı & Kavak, 2022). The time adolescents spend with smartphones is filled with activities such as access to information, self-expression, education, communication, social media, video watching and games (Terzioğlu et al., 2023; Tomczyk & Lizde, 2022). With smartphones becoming an integral part of our lives by providing access to the latest information and services, a new

concept, nomophobia (No Mobile Phobia), an involuntary anxiety caused by not being able to reach the smartphone device and not being able to meet imaginary needs with the device, has emerged (Molu et al., 2024; Rodríguez-García et al., 2020). Nomophobia manifests itself with features such as using their smartphones after waking up in the morning, carrying the phone charger with them all the time, checking their cell phones frequently, never turning off the phone, checking messages and calls frequently, and limiting face to face social interactions (Bragazzi & Del Puente, 2014; Kuscu et al., 2021). Such behaviors may reduce adolescents' sensitivity to environmental stimuli while causing them to develop excessive dependence on digital devices. In particular, the replacement of face to face social interactions with virtual connections can negatively affect adolescents' psychosocial development (Kuscu et al., 2021).

Adolescence is a critical period for searching for identity, social relationships are of great importance and socializing with peers (Edwards et al., 2022). Socializing with peers during adolescence is part of psychosocial development. However, during this process, overly dependent relationships may develop that can hinder the formation of healthy social bonds (Lan et al., 2023; Shao & Kang, 2022). Indeed, Shao and Kang (2022) note that excessive emotional dependence observed in adolescents can lead to conflict and social isolation in peer relationships, while Lan et al. (2023) reveal that incompatibilities in peer interactions have negative effects on self-efficacy, self-esteem, and social adjustment. Additionally, adolescents experiencing feelings of loneliness may tend to turn to smartphones and mobile internet devices to alleviate these feelings. However, this tendency may pave the way for the emergence of nomophobic symptoms when combined with excessive use (Heng et al., 2023; Safaria et al., 2024).

A study conducted in Türkiye has revealed that adolescents' levels of nomophobic behavior are above average (Gezgin & Çakır, 2016). Considering the feeling of loneliness that is commonly experienced during adolescence, examining the relationship between these two phenomena is particularly important (Kara et al., 2021). In the literature, there are some studies evaluating nomophobia and loneliness in adolescents (Dehghaniana & Bordbara, 2023; Güner & Demir, 2022; Kılınç et al., 2022; Rodríguez-García et al., 2020; Safaria et al., 2024). Studies conducted by Dehghaniana and Bordbara (2023), Kılınç et al. (2022), and Güner and Demir (2022) have revealed a significant and positive relationship between nomophobia and loneliness. These studies emphasize that technology addiction weakens adolescents' perceived social support and increases feelings of loneliness. Rodríguez-García et al. (2020) reported that nomophobia negatively affects emotional regulation processes, while Safaria et al. (2024) drew attention to the relationship between nomophobia and psychological stress and social withdrawal. While the current literature focuses on the positive correlation between nomophobia and loneliness, it does not sufficiently address how individual differences (e.g., age, gender, social media interaction, phone usage habits) shape this relationship. This study aims to fill this gap in the literature by examining the relationship between nomophobia and loneliness through multiple regression analysis within the framework of demographic (age, gender) and behavioral (frequency of phone checking, social media

interaction) variables. These two issues, which have a significant impact on adolescent health, should be investigated by pediatric nurses who play an important role in health promotion. In this way, pediatric nurses can identify adolescents at risk for nomophobia and loneliness and provide them with healthy social communication skills. By examining the nomophobia and loneliness levels of adolescents, this study is thought to help us better understand digital addiction problems and develop strategies to cope with these problems at an early stage.

This study was conducted to examine the determinants of nomophobia and its relationship with loneliness among adolescents. In line with the general purpose stated above, the research questions are as follows: (1) What is the prevalence of nomophobia among adolescents? (2) What is the level of loneliness among adolescents? (3) What is the relationship between nomophobia and loneliness levels among adolescents? (4) "Do age, gender, family income status, age of first phone use, daily phone usage time, habit of checking the phone in the morning, number of social media friends, and level of loneliness significantly predict the level of nomophobia in adolescents?"

Methods
Research design and participants
A descriptive and cross-sectional methodology was used in the study. The population of the study consisted of 1157 adolescents between the ages of 14-17 in four high schools determined by using a simple random method within the scope of probability sampling method in a city center located in the Western Black Sea region of Türkiye. When the sample calculation was calculated with a 5% margin of error and 95% confidence level, 324 adolescents were found to be sufficient for the sample. (Innocenti et al., 2023). To obtain this number, 805 adolescents were invited to participate in the study and 536 adolescents volunteered to participate. The exclusion criteria for adolescents were as follows: a) the presence of any barrier to communication, and b) the parent's not giving consent to participate in the study. During the study process, 22 adolescents were excluded from the data set because their parents did not sign the informed consent form, and eight adolescents were excluded because their survey responses were incomplete or inconsistent. As a result, the analyses were performed on complete data from 506 adolescents.

Data collection
Research data were collected from adolescents face-to-face between February 10 and April 14, 2025. Their parents were also informed about the form by their guidance counselors and their written consent was obtained. Adolescents filled out the data collection forms using paper and pencil during school hours, as deemed appropriate by the school administration. Data were collected using the "Introductory Information Form", "Nomophobia Scale for the Nine-Eighteen Age Group", and "UCLA Loneliness Scale Short Form (for Adolescents)". The data collection process took 20-25 minutes.

Descriptive information form
The content of the form has been developed by researchers based on the literatüre (Güner & Demir, 2022; Kılınç et al., 2022; Özdemir & Bektaş, 2020). The form includes 12 questions about sociodemographic and some

information about smartphone use (age at first smartphone use, daily smartphone use, frequency of daily smartphone checks, number of friends on social networks, number of applications actively used on the mobile phone, checking the smartphone when waking up in the morning).

Nomophobia Scale for the Nine-Eighteen Age Group (NMP-Q)

The Nomophobia Scale was developed by Yildirim and Correia (2015). Its validity and reliability for the 9–18 age group was studied by Özdemir and Bektaş (2020), and its Cronbach's alpha value was found to be 0.90. The scale consists of four subdimensions and 20 items. "It is a seven-point Likert-type scale with "inability to access information " (e.g., "I feel uncomfortable when I cannot access information from my smartphone all the time"), "loss of connection" (e.g., "I am afraid that my smartphone will run out of battery"), "inability to communicate" (e.g., "I get nervous because I don't know if someone is trying to reach me or not."), and "feeling uncomfortable" (e.g., "I feel uncomfortable because I am unable to keep up with social media and other online networks"). Scale score =20: No nomophobia 21≤ scale score <60: Mild nomophobia 60≤ scale score <100: Moderate nomophobia 100≤ scale score ≤140: Severe nomophobia (Özdemir & Bektaş, 2020). In this study, Cronbach's alpha value was 0.864.

UCLA Loneliness Scale Short Form (for Adolescents)

UCLA Loneliness Scale Short Form (for Adolescents) This scale was developed by Hays and DiMatteo (1987). UCLA Loneliness Scale adapted into Turkish by Yıldız and Duy (2014) consists of seven items and a dimension with the same name. The scale consists of seven items in a four-point Likert-type scale and its scoring varies between 7 and 28 (e.g., "I feel excluded from the group"). The internal consistency coefficient of the scale is 0.74 and the test-retest reliability coefficient is 0.84. High scores on the scale indicate a high level of loneliness (Yildiz & Duy, 2014). In this study, Cronbach alpha value was found to be 0.840.

Ethical aspects of research

In this study, approval was obtained from the Social and Human Sciences Ethics Committee of Bartin University (Protocol no: 2024-SBB-0990/15, Date: 11.12.2024) and written permission was obtained from the Provincial Directorate of National Education (MEB.TT.2024.012957 Date: 30.12.2024). All stages of the study were conducted in accordance with the Helsinki Declaration. Written informed consent was obtained from the parents of participating adolescents, and verbal consent was obtained from the adolescents themselves; the necessary safeguards regarding data confidentiality were provided.

Data analysis

SPSS (Statistical Package for the Social Sciences) program was used to analyze the data obtained in the study. Mean, standard deviation, minimum and maximum values were calculated within the scope of descriptive statistics. In order to determine whether nomophobia levels differed according to demographic variables, t-test for independent samples was applied for two group comparisons and one-way analysis of variance (ANOVA) was applied for comparisons involving more than two groups; in cases where significant differences were found, the direction of the difference was determined by post hoc tests (Benforroni). Pearson correlation analysis was performed to examine the relationships between continuous variables. The relationships between the UCLA Loneliness Scale Short Form and the NMP-Q and its sub-dimensions were evaluated in this context. In addition, multiple linear regression analysis was conducted to determine the variables predicting nomophobia scores. In the regression analyses, the predictive power of variables such as demographic characteristics, smartphone usage behaviors and loneliness level on nomophobia was examined with the help of three consecutive models. The significance level was accepted as $p<0.05$ in all analyses.

Results

The mean age of adolescents was 15.48 ± 0.84 years (14–17), and age was positively correlated with nomophobia ($r=0.112$, $p=0.012$). Girls (56.9%) had a significantly higher mean nomophobia score (73.57±23.29) than boys (65.74±21.90) ($t=3.877$, $p<0.001$). Although no significant difference was found between grade levels ($p>0.05$), 12th

Table 1. The difference in the mean scores of the NMP-Q according to adolescent demographic characteristics (n=506)

Demographic Characteristics	n (%)	Mean±SD	Significance
Age Mean±SD (Range) / NMP-Q 15.48±0.84 (14-17) / **r=0.112**			**p=0.012**
Gender			
Girl	288 (56.9)	73.57±23.29	t=3.877
Boy	218 (43.1)	65.74±21.90	**p=0.000**
Grade			
9	65 (12.8)	66.36±3.33	F=2.505
10	204 (40.3)	68.12±1.52	**p=0.058**
11	176 (34.8)	72.50±1.71	**Post hoc**
12	61 (12.1)	74.60±2.88	12>9,12<10,11<9,11<10
Mother's education level			
Primary school and below	253 (50.0)	71.00±25.72	t=0.782
Primary school and above	253 (50.0)	69.40±19.96	p=0.485
Father's education level			
Primary school and below	150 (29.6)	73.15±26.97	t=1.698
Primary school and above	356 (70.4)	68.96±21.04	p=0.91
Family income status			
Income less than or equal to expenditure	306 (60.5)	73.31±22.24	t=3.769
			p=0.000
More income than expenditure	200 (39.5)	65.44±23.40	

Table 2. The difference in the mean scores of the NMP-Q according to adolescents' smartphone use behaviors (n=506)

Variables	Mean±SD (Range)	NMP-Q
Age at first smartphone use (years)	11.83±2.16 (6-16)	r=-0.145 **p=0.001**
Daily smartphone usage time (hours)	3.36±1.94 (1-10)	r=0.292 **p=0.000**
Frequency of daily smartphone checks	36.82±5.57 (5-60)	r=0.292 **p=0.000**
Number of applications actively used on mobile phones	4.29±1.89 (1-8)	r=0.073 p=0.101
Number of friends on social networks		
More or less the same as real life	92.68±26.14	t=4.510
More than real life	73.06±20.49	**p=0.000**
Checking the smartphone when you wake up in the morning		
Yes	71.52±23.15	t=4.199
No	60.00±19.17	**p=0.000**

graders had the highest mean score. Parental education levels were not significantly associated with nomophobia. Adolescents whose family income was less than or equal to expenses had higher scores than those with income exceeding expenses (t=3.769, p<0.001) (Table 1).

A negative correlation was observed between age at first smartphone use and nomophobia (r=−0.145, p=0.001), while daily smartphone usage time (r=0.292, p<0.001) and frequency of daily phone checks (r=0.292, p<0.001) were positively correlated. The number of actively used applications was not significantly related (p>0.05). Nomophobia scores were higher among those with as many or fewer real-life friends than social media friends, and among those who checked their phone immediately after waking up (both p<0.001) (Table 2).

The mean loneliness score was 14.91±3.98 (7-26). This score indicates a moderate level of loneliness. The highest score is in the sub-dimension "Inability to Communicate" 22.72±9.18. This is followed by "Abandonment of Comfort" (18.20±7.20) and "Inability to Connect Online" (14.81±6.95). The lowest is in the "Inability to Access Information" sub-dimension (14.46±5.89). Nomophobia was detected in the entire sample (100%) (Table 3).

Table 3. Mean scores of UCLA Loneliness Scale Short Form and NMP-Q and presence of nomophobia (n=506)

Scales	Mean± SD (Range)
UCLA Loneliness Scale Short Form	14.91±3.98 (7-26)
NMP-Q	
Lack of access to information	14.46±5.89 (4-28)
Sacrificing comfort	18.20±7.20 (5-35)
Failure to communicate	22.72±9.18 (6-42)
Failure to connect online	14.81±6.95 (5-35)
Total	70.20±23.01 (22-134)
Presence of Nomophobia*	**n (%)**
Yes	506 (100.0)
No	0 (0.0)

*NMP-Q total score<20= No nomophobia; Nomophobia Scale for Nine-Eighteen Year Olds total score>21= Nomophobia.

The findings show that there are significant and positive relationships between the level of loneliness and the sub-dimensions of nomophobia. Loneliness scores were found to be significantly correlated with the sub-dimensions of

nomophobia scale such as "Inability to Access Information" (r=0.142, p≤0.001), "Waiver of Comfort" (r=0.322, p≤0.001, "Inability to Communicate" (r=0.142, p≤0.001) and "Inability to Connect Online" (r=0.232, p≤0.001). In addition, a significant positive correlation was found between loneliness and nomophobia total score (r=0.264, p≤0.001). These findings indicate that as the level of loneliness increases in adolescents, the level of nomophobia also increases. Among the sub-dimensions of nomophobia, the strongest relationship was observed between "Inability to Connect Online" and total nomophobia score (r=0.826, p≤0.001) (Table 4).

Table 4. Mean scores of UCLA Loneliness Scale Short Form and NMP-Q and presence of nomophobia (n=506)

Scales	1	2	3	4	5	6
UCLA Loneliness Scale Short Form (1)	1					
NMP-Q						
Inability to access information (2)	0.142**	1				
Sacrificing comfort (3)	0.322**	0.564**	1			
Failure to communicate (4)	0.142**	0.381**	0.404**	1		
Failure to connect online (5)	0.232**	0.572**	0.570**	0.500**	1	
Total (6)	0.264**	0.758**	0.791**	0.774**	0.826**	1

*p<0.05; ** p<0.001.

The results of the multiple linear regression analysis conducted to determine the factors associated with nomophobia are presented in Table 5. In the analysis conducted through three different models, the effect of variables predicting the nomophobia levels of adolescents was evaluated. In Model 1, only demographic variables (age, gender and family income status) were included. As a result of the analysis, it was found that age significantly predicted nomophobia scores in a negative direction (β =-2.815, 95% CI =-5.148-0.481; p<0.05). Gender had a positive and significant effect on nomophobia (β = 7.053, 95% CI = 3.051- 11.054; p<0.001). Accordingly, the nomophobia scores of girls were significantly higher than those of boys. Family income status was also found to be a significant predictor in this model (β = 6.257, 95% CI = 2.184- 10.331; p <0.001). The explanatory power of Model 1 is 5.9% (R² = 0.059). In Model 2, in addition to demographic variables, variables related to smartphone use were included. In this model, age (β =-2.296, p <0.05), gender (β = 5.314, p <0.01), age at first smartphone use (β =- 0.973, p <0.05), and daily smartphone usage time (β = 2.006, p <0.001) were found to be significant predictors. The effect of family income status in this model lost its significance. The explanatory level of Model 2 increased to 14.4% (R² = 0.144). In Model 3, variables related to loneliness level and social media use were added to the model. In this last model, gender (β = 7.195, p <0.001), age (β =-2.403, p<0.05), daily smartphone usage time (β = 1.701, p <0.001), number of friends on social networks (β = 9.869, p<0.001), checking the phone when waking up in the morning (β = 9.773, p<0.001) and loneliness score (β = 1.401, p <0.001) were found to be significant predictors. This model explained 24.6% of nomophobia scores (R² = 0.246, F = 17.473, p<0.001).

Table 5. Multiple linear regression analysis of predictors of Nomophobia (n=506)

Variables	β (%95 GA)	β (%95 GA)	β (%95 GA)
Age	-2.815 (-5.148-0.481) **	-2.296 (-4.610-0.018)	-2.403 (-4.634-0.172) **
Gender	7.053 (3.051-11.054) **	5.314 (1.495-9.134) *	7.195 (3.458-10.933) **
Family income status	6.257 (2.184-10.331) **	0.747 (-3.312-4.806)	0.927 (-3.230-5.085)
Age at first smartphone use (years)		-0.973 (-1.876-0.069) *	-.070 (-.989-0.850)
Daily smartphone usage time (hours)		2.006 (0.956-3.055) **	1.701 (0.683-2.718) **
Frequency of daily smartphone checks		-0.116 (-0.451-0.219)	-0.076 (-0.400-1.652)
Number of friends on social networks		8.293 (5.382-11.204) **	9.869 (7.028-12.709) **
Checking the smartphone when you wake up in the morning		10.468 (4.348-16.588) **	9.773 (3.820-15.726) **
Loneliness			1.401 (0.900-1.903) **

Model 1: F=10.581, p<0.001, R²=0.059; Model 2: F=17.734, p<0.001, R²=0.144; Model 3: F=17.473, p<0.001, R²=0.246. *p<0.05; **p≤0.001. Bold characters indicate P-values less than or equal to 0.05.

Discussion

This study examined the relationship between nomophobia and loneliness, as well as the determinants of nomophobia. Factors that increase the level of nomophobia were identified as young age, female gender, prolonged phone use, having more friends on social media than in real life, the habit of checking the phone immediately upon waking up, and a high sense of loneliness. These results indicate that nomophobia is not merely a matter of technology addiction but a complex issue also linked to social and psychological factors.

Adolescence is a period in which both developmental and psychosocial sensitivities become apparent in adolescents' relationship with digital technologies, and the fact that technology-dependent anxiety types such as nomophobia differ according to age is attracting increasing attention in the literature (Gezgin & Çakır, 2016; Yildirim & Correia, 2015). This study found that nomophobia levels decrease significantly with age. In particular, younger adolescents experience more intense anxiety when separated from their cell phones compared to their older peers. This can be explained by the fact that emotional regulation skills are not yet sufficiently developed in the early stages of adolescence and the need to form social bonds is more intense. Similarly, it has been noted that adolescents who began using phones at an early age and have more friends on social media than in real life tend to have higher levels of nomophobia (Kılınç et al., 2022). A systematic review emphasized that loneliness has a direct effect on nomophobia and that this relationship becomes more pronounced in early adolescence (Juwita et al., 2024). These findings suggest that mental skills such as attention, planning, and self-control, which develop with age, and a more critical approach to technology may reduce levels of nomophobia. Therefore, fostering digital literacy at an early age and developing age-sensitive intervention programs should be among the key strategies in combating nomophobia. In this study, being a girl was found to be associated with higher levels of nomophobia. Similarly, previous research with adolescents has shown that girls tend to have higher nomophobia scores than boys (Gezgin & Çakır, 2016; Molu et al., 2024; Terzi et al., 2024). This difference may be explained by the tendency of young girls to form stronger social bonds and use digital communication tools more frequently to maintain these connections. As a result, their dependence on digital devices and consequently, nomophobia may be intensified (Edwards et al., 2022). In contrast, boys' attachment to digital devices might stem from more functional or practical smartphone use, which could lead to milder nomophobia symptoms compared to girls (Noh & Shim, 2024). These findings suggest that gender plays an important role in the development of nomophobia, with young girls being particularly vulnerable to digital addiction.

Smartphones may cause adolescents to move away from the physical world and become more involved in digital media (Edwards et al., 2022; Yıldız Durak, 2020). In this study, longer phone use was found to be effective in increasing the level of nomophobia. Similarly, in studies conducted with adolescents, it was found that adolescents exhibited more nomophobic behaviors as the duration of daily smartphone use increased (Kara et al., 2021; Safaria et al., 2024). The long term use of phones can negatively affect the development of real-world social skills by shifting adolescents' social interactions from face to face relationships to virtual platforms (Bozzola et al., 2022; Twenge & Campbell, 2018). This situation causes individuals to become isolated from their social circles and deepens their feelings of loneliness, increasing the risk of developing nomophobia (Sun et al., 2023). Additionally, the constant need to be online increases anxiety and stress levels in adolescents and causes intense anxiety when the phone is lost or access to it is blocked (Buctot et al., 2020). Therefore, considering the rates of long term phone use among adolescents, parental control and a healthy school environment should be established to promote a healthy lifestyle among adolescents and prevent the increase of smartphone addiction (Buctot et al., 2020; Terzi et al., 2024). In this regard, school based psychoeducational programs and awareness-raising activities involving family participation can reduce the risk of digital addiction, thereby helping to lower levels of nomophobia and loneliness. In addition, digital addiction can be prevented by developing social skills and increasing opportunities for face to face communication.

In this study, having more friends on social media than in real life was found to be effective in increasing the level of nomophobia. In a study conducted with adolescents, anxiety about not being able to communicate with members of the social circle was identified as one of the common factors of nomophobia (Tomczyk & Lizde, 2022). The tendency for adolescents to form more virtual connections through social media platforms than real-life social ties may reinforce feelings of physical loneliness (Noh & Shim, 2024). Physical loneliness can increase adolescents' fear of disconnecting from the digital world, which can lead to an intensification of nomophobia symptoms. Adolescents with high levels of social anxiety, in particular, prefer to communicate via smartphones, which they feel safer using, rather than face-to-face interaction (Ayaz Alkaya & Kulakçı Altıntaş, 2025). This preference can lay the groundwork for excessive dependence on online social interaction over time. A study conducted with adolescents in China revealed that insufficient fulfillment of

psychological needs and low life satisfaction are among the fundamental mechanisms that increase smartphone addiction through loneliness and social anxiety (Sun et al., 2023). Similarly, a study conducted with adolescents in the Middle East, including Jordan, found that those with high levels of social anxiety had longer gaming durations and higher tendencies toward smartphone addiction (Abu Khait et al., 2025). When these findings are considered together, it can be assumed that increased smartphone use among adolescents with high levels of social anxiety or social phobia may trigger and exacerbate symptoms of nomophobia, which is the intense anxiety they feel when separated from their devices. Therefore, interventions that simultaneously reduce loneliness and social anxiety in adolescents, while also strengthening face to face social bonds, and include psychosocial support as well as lifestyle adjustments, may be applicable in preventing and alleviating nomophobia symptoms (Raju et al., 2023).

The habit of adolescents frequently checking their phones in the morning is seen as an important behavior that increases the risk of digital addiction (Köse & Murat, 2021). In this study, the habit of checking the phone first thing in the morning was found to be effective in increasing the level of nomophobia. Previous studies have shown that the habit of checking the phone in the morning negatively affects the daily functioning and focusing abilities of adolescents, which is associated with nomophobia (Kılınç et al., 2022). The habit of checking the phone in the morning may increase an adolescent's fear of disconnecting from the digital world, leading to exacerbation of nomophobia symptoms (Juwita et al., 2024). This behavior can reinforce the cycle of mobile phone addiction, especially in adolescents, by reinforcing the need for the phone to be constantly accessible. With the widespread use of technology in everyday life, dependence on digital devices has become a significant social issue (Cascio et al., 2023). In this study, feeling of loneliness was found to be effective in increasing the level of nomophobia. Similarly, in studies conducted with adolescents, loneliness can predict nomophobia in a positive and significant way (Dehghaniana & Bordbara, 2023; Kılınç et al., 2022). Feeling lonely may lead adolescents to seek more digital communication (Safaria et al., 2024). The relationship between loneliness and nomophobia should not be considered solely as a direct connection; these two phenomena must be evaluated within the framework of common psychological factors. In particular, psychological problems such as depression and social anxiety are strongly associated with both loneliness and nomophobia (Elhai et al., 2020). Depression increases social withdrawal and isolation in adolescents, while social anxiety can lead individuals who struggle with face-to-face communication to turn to digital environments (Odgers & Jensen, 2020). These situations can deepen feelings of loneliness while also leading to compulsive phone use, thereby exacerbating symptoms of nomophobia (Peng et al., 2022). Additionally, social development challenges and fragility in self-perception specific to adolescence can increase the impact of these psychological issues and raise the risk of digital addiction (Bozzola et al., 2022). Therefore, it is important to consider these common psychological factors in order to better understand the relationship between loneliness and nomophobia. In psychosocial interventions, targeting conditions such as loneliness, depression, and social anxiety may contribute to the prevention and control of nomophobia in adolescents.

Limitation of the Study

This study had some limitations. First, generalizability is low because participants were selected from schools in only one region and were based on self-report questionnaires. Secondly, the use of a cross-sectional design makes it difficult to determine cause and effect relationships. Third, participants' responses regarding their levels of loneliness and nomophobia may have been influenced by the tendency to give socially desirable answers.

Conclusion and Recommendations

This study revealed a link between nomophobia and loneliness in adolescents. Therefore, it is important for adolescents to develop healthy digital habits. At the same time, social ties need to be strengthened to reduce feelings of loneliness. Social awareness campaigns and educational programs can be implemented to reorganize adolescents' relationships with digital devices (Lin et al., 2021). Such efforts can help both maintain psychological health and reduce symptoms of nomophobia. Pediatric nurses can establish a follow-up program to monitor adolescents' efforts to manage smartphone use and are well positioned to provide guidance when needed (Sarman & Çiftci, 2024). Evidence-based interventions to reduce smartphone use by pediatric nurses should be planned and implemented specifically for adolescents, who are identified as being at highest risk for addiction (Güner & Demir, 2022; Terzi et al., 2024). Accordingly, collaborative strategies between parents, educators and health professionals may need to be developed to help adolescents cope with digital addiction and develop healthy living habits (Tomczyk & Lizde, 2022).

Informed Consent

Written consent was obtained from the parents of the adolescents participating in the study and verbal consent was obtained from the adolescents.

Peer-Review

Externally peer-reviewed.

Author Contributions

F.D.: Concept, Design, Supervision, Materials, Data Collection, Analysis and/or Interpretation, Literature Review, Writing, Critical Review.

A.K.: Supervision, Materials, Data Collection, Analysis and/or Interpretation, Literature Review, Writing, Critical Review.

S.N.A.: Materials, Data Collection, Literature Review, Writing,

Ü.E.: Materials, Data Collection, Literature Review, Writing.

K.K.: Materials, Data Collection, Literature Review, Writing.

Conflict of Interest

There is no conflict of interest.

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