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Nomophobia in University Students: The Roles of Digital Addiction, Social Connectedness, and Life Satisfaction

Üniversite Öğrencilerinde Mobil Telefon Yoksunluğu Korkusu (Nomofobi): Dijital Bağımlılık, Sosyal Bağlılık ve Yaşam Doyumunun Rolü

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ABSTRACT

This study examines the predictive power of digital addiction, social connectedness and life satisfaction on the nomophobia levels of university students. Participants consisted of 451 university students studying in various departments at three state universities in Ankara. The Nomophobia Questionnaire, Digital Addiction Scale, Social Connectedness Scale-Revised, The Satisfaction with Life Scale, and Personal Information Form were used to collect the data. The data were analyzed through t-test, one-way analysis of variance, and multiple linear regression analysis. Results indicated that while students' nomophobia level differs significantly according to gender, daily usage time, and the number of daily checks, it does not differ according to the duration of having a smartphone. Moreover, social media addiction significantly predicted the level of nomophobia, while game addiction, impact on daily life, social connectedness, or life satisfaction did not significantly predict nomophobia levels. The findings are discussed in comparison to the existing literature and suggestions are subsequently made.

Article Information

Keywords
Nomophobia
Digital Addiction
Social Connectedness
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ÖZET

Bu araştırmada dijital bağımlılık, sosyal bağlılık ve yaşam doyumunun üniversite öğrencilerinin mobil telefon yoksunluğu korkusu düzeyini yordama gücü araştırılmıştır. Araştırma grubu, Ankara'da bulunan üç devlet üniversitesinin çeşitli bölümlerinde okumakta olan 451 üniversite öğrencisinden oluşmaktadır. Araştırmada Nomofobi Ölçeği, Dijital Bağımlılık Ölçeği, Revize Edilmiş Sosyal Bağlılık Ölçeği, Yaşam Doyumu Ölçeği ve Kişisel Bilgi Formu kullanılmıştır. Toplanan veriler t testi, tek yönlü varyans analizi ve regresyon analizi ile incelenmiştir. Sonuçlara göre, öğrencilerin mobil telefon yoksunluğu korkusu düzeyleri cinsiyete, akıllı telefonu günlük kullanma süresi ve günlük kontrol etme sayısına göre anlamlı farklılık gösterirken akıllı telefona sahip olma süresine göre farklılık göstermemektedir. Sosyal medya bağımlılığının mobil telefon yoksunluğu korkusu düzeyini anlamlı olarak yordadığı; oyun bağımlılığı, günlük hayata etki, sosyal bağlılık ve yaşam doyumunun ise mobil telefon yoksunluğu korkusu düzeyini anlamlı olarak yordamadığı saptanmıştır. Elde edilen bulgular alanyazına dayalı olarak tartışılmıştır ve bazı öneriler sunulmuştur.

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INTRODUCTION

Today, smartphones are one of the most essential devices making human life easier and more convenient. According to the Turkey Statistical Institute (TUIK, 2020), the use of mobile phones/smartphones in households has risen to 99.4%. According to the We Are Social report, the average daily time spent on the internet in Turkey was 7 hours 29 minutes in 2020. With the increase in the importance of smartphones in daily life, addictions such as smartphone addiction, digital game addiction, social media addiction, Facebook addiction, and Instagram addiction (Błachnio et al., 2018; Bragazzi & Del Puente, 2014; Chen et al., 2016; Choi et al., 2015; Savcı & Aysan, 2017) have now become a critical issue. Another problem that has arisen with the increasing use of smartphones recently is nomophobia. Nomophobia is defined as the unrealistic fear and anxiety felt when a person is unable to reach or communicate via his/her smartphone (Yıldırım & Correia, 2015). King, Valença, and Nardi conducted a pioneering study in 2010 and defined nomophobia as a 21st-century disorder that results from the excessive use of the latest technology. In fact, Bragazzi and Del Puente (2014) stated that nomophobia should be added to DSM-5 due to the anxiety, stress, and worry it causes in individuals and because of its rapid spread.

In recent years, many studies have been conducted on this problem. In studies that have been conducted to date, nomophobia has often been examined in terms of its relation to gender and duration of smartphone use. While some studies have indicated that women have higher levels of nomophobia (Arpacı, 2020; Gezgin & Çakır, 2016; Leon et al., 2021; Schwaiger & Tahir, 2020), some have shown that men experience it at higher levels, (Özdemir et al., 2018; Nagpal & Kaur, 2016). Other studies have found no difference in nomophobia according to gender (Adnan & Gezgin, 2016; Dixit et al., 2010; Özdemir et al., 2018). Those who have owned a smartphone for a long period (Güllüce et al., 2019; Sırakaya, 2018; Yıldırım et al., 2016), those who have a high daily usage time (Gonçalves et al., 2020; Pavithra et al., 2015; Schwaiger & Tahir, 2020), and those with a higher number of daily checks of their smartphone (Abraham et al., 2014; Schwaiger & Tahir, 2020) were found to have higher levels of nomophobia. These variables have been included in this study as they are considered primary characteristics of nomophobia (Bragazzi & Del Puente, 2014).

Findings in the literature indicate that the frequent use of smartphones causes problems in the educational, professional, and private lives of individuals; excessive use of these devices has also been found to negatively affect interpersonal relationships (Bragazzi et al., 2019; Erdem et al., 2016; Mengi et al., 2020; Prasad et al. 2017). Nomophobia has been found to be linked to loneliness, anxiety, depression, social phobia, impulsivity, and personality disorder (Arpacı, 2020; Argumosa-Villar et al., 2017; Büyükçolpan, 2019; Çevik Durmaz et al., 2020; Kuşçu et al., 2020; McIntyre et al., 2015; Nagpal & Kaur, 2016; Notara et al., 2021; Spitzer, 2015; Yıldız-Durak, 2018). In addition, self-esteem, extroversion, conscientiousness, and neuroticism were found to be predictors of nomophobia (Argumosa-Villar et al., 2017). Finally, research has indicated that there are moderately positive significant relationships between nomophobia and psychopathological symptoms (Gonçalves et al., 2020). Therefore, it can be stated that nomophobia is closely related to many personality and mental health variables.

It can be said that smartphone use is also associated with types of digital addiction. Digital addiction is a behavioral addiction that manifests itself in the form of careless, impulsive, and excessive contact with the latest technology and digital devices. Some addiction types include social network addiction, online/offline game addictions, and internet addiction (Jiang et al., 2015; Yengin, 2019; Arslan et al., 2015; Cover, 2004). Research has revealed that there are significant positive relationships between online gaming and smartphone addiction (Gezgin et al., 2018), between nomophobia and social media addiction (Gezgin &

Parlak, 2018; Yıldız-Durak, 2018), and between nomophobia and internet addiction (Kaviani et al., 2020). Digital addictions increase the time people spend with smartphones and can negatively affect their daily routines and social relationships (Kaviani et al., 2020; Mesch, 2001; Savcı & Aysan, 2017). Digital addictions, which can trigger the formation of new problems for humans, may increase nomophobia levels. According to the Deloitte Global Mobile User Survey Report (2019), the increase in the number of individuals who access social media via smartphones (86%) and of those who prefer to play games on their smartphones (55%) is emblematic of the relationship between nomophobia and social media and game addictions.

As the time spent with smartphones increases, people's face-to-face interaction with their social environment decreases. This decrease in close and meaningful relationships with the increase in smartphone use may bring about feelings of loneliness (Aktaş & Yılmaz, 2017; McIntyre et al., 2015; Lei et al., 2017). From the moment they are born, humans require social relations and interactions, and the need for these types of bonding mechanisms continues in later stages of life, as well (Baumeister & Leary, 1995). Social connectedness is defined as the sense of belonging and closeness felt by the individual towards the environment he/she lives in, a lack of which may cause loneliness (Lee & Robbins, 1998). The fact that individuals have transferred their social relations spontaneously or compulsively to the virtual environment might be related to their level of social connectedness. A study conducted on students' levels of uncontrolled internet use showed that those who had high levels of uncontrolled internet use had low levels of social connectedness (McIntyre et al., 2015). Findings from another study revealed that students with higher social connectedness had higher levels of internet addiction (Hırlak et al., 2016). These contradicting research results have increased curiosity about the relationship between social connectedness and nomophobia.

The relationship between smartphone use and life satisfaction and happiness has also begun to arouse interest. Life satisfaction is a cognitive assessment of one's life by comparing what she/he wants to achieve in his/her life in line with the criteria s/he has set (Diener et al., 1985). There are studies in the literature indicating a negative relationship between smartphone use and nomophobia and life satisfaction (Güllüce et al., 2019) Other studies have found that there is a positive relationship (Blachnio et al., 2018) between them. Since life satisfaction is thought to be an important element of mental health, the relationship between university students' life satisfaction and nomophobia has also increasingly been considered worth examining.

Although the research is not vast, studies that aim to understand nomophobia more deeply and explore its effects on human life are on the rise. With the increasing popularity of smartphones among university students (Yıldırım, 2014), the number of research studies concerning the issue in Turkey and around the world has also increased. There are research results (Adnan & Gezgin, 2016; Jena, 2015) indicating that the level of nomophobia is high among university students in the country. In a relatively recent study conducted on university students in Turkey, it was found that 46% have high levels of nomophobia (Yıldırım et al., 2016). Elsewhere, a study conducted on 600 medical faculty students—in order to examine the prevalence of nomophobia and the effect of nomophobia on sleep quality and academic success in India—revealed that approximately two-fifths of the students were nomophobic (Mengi et al., 2020). Again, in this study, it was found that academic performance indicators such as a decrease in diligence and concentration and class tardiness had significant relationships with nomophobia scores. Therefore, nomophobia seems to be a variable that can affect university students' academic achievement (Erdem et al., 2016) and self-regulation (Argumosa-Villar et al., 2017).

Current Study

The efficiency of university education, in which in-depth and professional training is obtained in a certain discipline, is extremely important. Therefore, it is crucial to determine the variables associated with nomophobia in university students. Studies that have been conducted on university students' nomophobia have often been about the prevalence of the disorder (Erdem et al., 2017; Explorer et al., 2017) and its relationship with smartphone use (Sırakaya, 2018) and academic achievement (Erdem et al., 2016). Although the relationship between nomophobia and personality variables such as attachment, depression, social support, (Büyükçolpan, 2019), and loneliness (Çevik-Durmaz et al., 2020) has been investigated recently, studies examining the relationship between nomophobia and various personality variables in Turkish university students are limited. In this study, the aim is to examine the relationship between nomophobia and digital addiction, social connectedness, and life satisfaction in order to better understand nomophobia behavior in Turkish university students. In addition, it was designed in order to find out whether nomophobia levels of university students differ significantly according to gender, duration of having a smartphone, daily usage time, and the number of daily checks. The research questions in the study are as follows: "What is the predictive power of social media addiction, game addiction, impact on daily life, social connectedness and life satisfaction on the nomophobia level of university students?" and "Does the nomophobia level of university students differ significantly according to gender, duration of having a smartphone, daily usage time, and the number of daily checks?"

METHOD

Participants

The participants included in the study consisted of 451 university students studying in various faculties at three state universities in Ankara during the spring term of the 2019-2020 academic year. Three hundred two (302) of the participants were female (67%), while 109 were male (33%). Their age ranged from 17 to 28 with an average of X̄: 20.34 (Sd: 1.63). One hundred ninety-seven (197) of the students (43.7%) were freshmen, 157 (34.8%) were sophomores, 15 (3.3%) were juniors, and 82 (18.2%) were seniors.

Ethical Statement

Permissions were obtained from the Hacettepe University Senate Ethics Committee (26 December 2019; 35853172-300) in order to conduct the research and to initiate the data collection process.

Measures

The Nomophobia Questionnaire, Digital Addiction Scale, Social Connectedness Scale-Revised, and The Satisfaction with Life Scale were used in the study. In addition, a personal information form was employed. The personal information form was created by the researchers and included questions that gathered information on the participants' gender, age, smartphone-type ownership, duration of having a smartphone, daily usage time, and the number of daily checks.

The Nomophobia Questionnaire. The 20-item scale, developed by Yıldırım and Correia (2015), was translated into Turkish by Yıldırım et al. (2016). It is a 7-point Likert-type scale. The scores that can be obtained from the scale are between 20 and 140. Twenty (20) total points indicates that the person is not nomophobic at all, while a score between 21 and 59 shows that s/he is mildly nomophobic; a score between 60 and 99 means that the respondent is moderately nomophobic, and a score ranging from 100 and 140 indicate extreme nomophobia. While the Cronbach's alpha reliability coefficient of the original form was

.95, the reliability coefficients of the subscales were found to be .83, .87, .94, and .81, respectively. The reliability coefficient of the Turkish form of the scale was .92 for the overall scale and .90, .74, .94, and .91 for the subscales, respectively. Fit indices verified the four-factor model of the Turkish scale according to confirmatory factor analysis (CFI = .92; RMSEA = .08). In the current study, Cronbach's alpha reliability coefficient was found to be .92 for the overall scale and .85, .77, .94, and .86 for the subscales, respectively.

Digital Addiction Scale. Developed by Arslan et al. (2015) to determine the level of digital addiction in high school and university students, this scale is a 5-point Likert-type scale. It has a three-factor structure with 29-items. Factor 1 (item 1-item 11) is named 'game', factor 2 (item 12-item 23) 'social media', and factor 3 (item 24-item 29) 'impact on daily life'. While Cronbach's alpha reliability coefficient for the entire scale was found to be .89, the reliability coefficients of the subscales of 'play', 'social media', and 'impact on daily life' were .88, .89, and .90, respectively (Arslan et al., 2015). In this study, Cronbach's alpha reliability coefficient for the total score of the scale was found to be .89, while the reliability coefficients for its subscales were .82, .85, and .86, respectively.

Social Connectedness Scale-Revised. The revised form of the original scale was developed by Lee and Robbins (2000). This one-dimensional scale consisting of twenty items is a 6-point Likert-type scale. The internal consistency reliability coefficient of the scale was found to be .92. CFA goodness of fit values were $\chi 2(sd = 160) = 299.54$, $p < .0001$, RMSEA = .07. CFI = .91. RMSR = .08, and RMSR = .08. The scale was adapted to Turkish by Sarıçam and Deveci (2017). According to the findings of the exploratory factor analysis of the Turkish scale, the Bartlet sphericity test value ($\chi 2 = 3320.697$, sd = 190) and the KMO value of sample adequacy (.92) met the criteria set in the literature. According to the confirmatory factor analysis results, the fit index values of the scale ($\chi 2$ (sd = 160)= 299.54, $p < .0001$, RMSEA = .07. CFI = .91. RMSR = .08) were adequate. In the criterion-related validity study of the scale, its relationship with the UCLA Loneliness Scale and the Social Provision Scale were examined, and relationships were found to be at a level of -.69 and .68, respectively. Cronbach's alpha reliability coefficient of the scale was found to be .89. In this study, Cronbach's alpha reliability coefficient of the scale was .93.

The Satisfaction with Life Scale. Developed by Diener et al. (1985), this scale was adapted into Turkish by Köker (1991). Consisting of five items, it is 7-point Likert-type scale. Scores between 5-35 can be obtained from the scale, and this gives a total score. The internal consistency reliability coefficient of the original scale was .87, and the test-retest reliability performed two weeks apart was found to be .82. Köker (1991), who conducted the validity study for the Turkish form, found the test-retest reliability coefficient of the scale to be .85. In another study, Yetim (1993) found the Cronbach's alpha reliability coefficient of the scale to be .86 and the test-retest reliability coefficient to be .73. In this study, the Cronbach alpha reliability coefficient of the scale was .85.

Procedures

Data collection was carried out by the first researcher during the fall semester of the 2019-2020 academic year. Professors from different departments at three different universities were contacted and appointments were made for the most convenient days and hours to collect data. Students were first informed about the research and their rights; then, they were asked to sign the consent form; subsequently, the instruments were implemented. Applications took around 20 minutes.

Data Analysis

First of all, normality, which is an important assumption for parametric tests, was checked. Looking at the skewness and kurtosis values, it was concluded that the distributions of each group for each research problem were normal since values ranged between –2 and +2 (Field, 2009; George & Mallery, 2010). By performing extreme and multivariate extreme controls, a total of 54 observations were deleted and analyses were performed with the remaining 451 observations. Whether there is a difference in the level of nomophobia according to gender and duration of having a smartphone was tested by an independent samples t-test; whether there was a difference in nomophobia level according to daily usage time and the number of daily checks was tested with one-way analysis of variance (ANOVA). The predictive power of social media addiction, game addiction, impact on daily life, and social connectedness and life satisfaction on the nomophobia level of university students was analyzed by multiple linear regression analysis. According to the Levene test, which was examined for the homogeneity of variances, this assumption was not violated for any of the groups. The multicollinearity assumption, which is an essential assumption for multiple linear regression analysis, was examined by looking at the tolerance and variance growth rate (VIF), and it was found that there was no multicollinearity problem. In addition, the scatter plot was examined for the assumptions of normality and covariance of residuals, and it revealed that the assumptions were met.

RESULTS

After determining the suitability of the data for analysis, descriptive statistics values were examined in order to interpret the data in accordance with the purpose of the research. Table 1 presents descriptive statistical findings regarding the variables of the study.

Table 1. Descriptive statistics regarding the variables

Variables	n	Lowest	Highest	X̄	Sd	Skewness	Kurtosis
Nomophobia	451	21	133	79.25	21.424	-0.107	-0.213
Digital Addiction	451	33	123	74.70	16.484	0.093	-0.423
Game Addiction	451	11	43	20.57	7.346	0.677	-0.247
Social Media Addiction	451	15	60	39.98	8.634	-0.176	-0.207
Effect on Daily Life	451	6	30	14.15	5.460	0.428	-0.354
Social Connectedness	451	28	120	89.08	16.774	-0.574	0.199
Life Satisfaction	451	5	25	14.86	4.093	-0.088	-0.194

Table 1 shows the lowest and highest values gathered from the scales and the average scores. The distribution of the scales and their subscales are normal since the skewness and kurtosis values of the scales are between –2 and +2. In addition, as a result of the analysis made in parallel with the Nomophobia Scale level norm, 63.9% of the participants were found to be moderately nomophobic, 19% mildly nomophobic, and 17.1% were considered highly nomophobic. The nomophobia mean score, which was found to be 79.25, is parallel to the finding that the majority of the group is moderately nomophobic. An independent samples t-test was conducted to determine whether the mean scores of nomophobia differed according to gender and duration of having a smartphone (Table 2).

Table 2. Independent t-test results showing the relationship of nomophobia with gender and duration of having a smartphone

Group	n	X̄	Ss	t	Sd	p	*η2*
Female	302	81.91	20.228	3.823	449	.000	0.032
Male	149	73.84	22.791				
5 years or less	111	78.04	21.230	-0.682	449	0.496	-
More than 5 years	340	79.64	21.504				

As Table 2 indicates, it was found that the mean nomophobia score of males is lower than that of females. This difference is statistically significant ($t(449) = 3.823$, $p = .000$, $p < .05$). The effect size for the difference is 0.032, which is a small effect. According to this finding, women's level of nomophobia is significantly higher than that of men. No statistically significant difference was found between the mean scores of nomophobia according to the duration of having a smartphone ($t(449) = -0.682$, $p = .496$, $p > .05$). In other words, the nomophobia mean scores of those who have used a smartphone for more than 5 years and those who have used one for 5 years or less are not significantly different. One-way analysis of variance (Table 3) was conducted to determine whether the mean scores of nomophobia differed according to the daily usage time of the students.

Table 3. ANOVA results showing the difference among nomophobia levels according to daily usage time

Source of Variation	Sum of Squares	Sd	Mean Squares	F	p	η2
Among Groups	14813.245	3	4937.748	11.511	.000	0.072
Within Groups	191736.431	447	428.941			
Total	206549.676	450				

According to the results of one-way analysis of variance, the group with the highest average score of nomophobia was the group that used smartphones for 7 hours or more per day ($\bar{X} = 87.53$). A statistically significant difference was found between the nomophobia mean scores of the groups according to daily usage time ($F(3,447) = 11.511$, $p = .000$, $p < .05$). The effect size for the difference was 0.072, which is a moderate effect. The Scheffe test was used to explore among which groups significant differences were obtained. According to these test results, the nomophobia mean scores of the groups with 1-2 hours of daily smartphone use and 5-6 hours and 7 and more hours of use are statistically significant ($p < .05$). The average score for nomophobia of those who use their smartphone for 5-6 hours and 7 hours or more is higher than those who use it for 1-2 hours. There is no statistically significant difference between the nomophobia mean scores of those who use a smartphone for 1-2 hours and those who use one for 3-4 hours ($p > .05$). The nomophobia mean scores of those who use a smartphone for 3-4 hours and those who use one for 7 hours or more are statistically significant ($p < .05$). The nomophobia level of those who use a device for 7 hours or more per day is significantly higher than those who use one for 3-4 hours. Those who have a daily smartphone usage time of 3-4 hours and 5-6 hours were not significantly different from each other ($p > .05$). One-way analysis of variance was conducted to determine whether the mean scores of nomophobia differed according to the number daily checks (Table 4).

Table 4. ANOVA results showing the difference among nomophobia levels according to daily checks of the smartphone

Source of Variation	Sum of Squares	Sd	Mean Squares	F	p	ηe
Among Groups	7436.038	2	3718.019	8.365	.000	0.036
Within Groups	199113.638	448	444.450			
Total	206549.676	450				

The results of one-way analysis of variance revealed that the group with the highest nomophobia score average was the group with a daily check number of 21 and above ($\bar{X}$ = 81.37). In addition, it was observed that as the number of checks decreases, the nomophobia mean score also decreases. A statistically significant difference was found between the mean scores of nomophobia among the groups according to the number of daily checks (F(2,448) = 8.365, p = .000, p <.05). The effect size for the difference was 0.036, which was a small effect. The nature of the significant difference obtained among the groups was analyzed with the Scheffe method, one of the multiple comparison tests. According to the Scheffe test results, the difference between the nomophobia mean scores of the groups that check their smartphones 1-10 times a day and 11 or more times a day are statistically significant (p < .05). The nomophobia score average of those who check their smartphones 11-20 times and 21 or more times a day is higher than those who check their smartphones 1-10 times a day. There is no statistically significant difference between the nomophobia means scores of the groups that check their smartphones 11-20 times a day and those checking them 21 times or more (p > .05). Multiple linear regression analysis was utilized to determine whether subscales of social media addiction, namely game addiction and its impact on daily life, as well as social connectedness and life satisfaction, significantly predicted students' nomophobia levels (Table 5).

Table 5. Results of the multiple regression analysis regarding the predictors of nomophobia

Variables	B	Standard Error	β	T	p	R Square	Partial R Square
Constant (Nomophobia)	21.094	6.97		3.026	0.003		
Game Addiction	-0.067	0.126	-0.023	-0.532	0.595	0.146	-.021
Social Media addiction	1.426	0.114	0.574	12.556	.000	0.579	.484
Effect on Daily Life	0.128	0.19	0.033	0.673	0.501	0.316	.026
Social Connectedness	-0.036	0.058	-0.028	-0.629	0.529	-.067	-.024
Life Satisfaction	0.266	0.227	0.051	1.173	0.241	-.066	.045
R = 0.581	R^2 = 0.338	Adjusted R^2 = 0.330					
$F_{(5.445)}$ = 45.401	p =.000						

As presented in Table 5, nomophobia had a moderate positive correlation (r = 0.579) with social media addiction, a moderate positive correlation (r = 0.316) with impact on daily life, and a low positive correlation with game addiction (r = 0.146) (p < .01) (Köklü et al., 2006). The relationships between social connectedness and life satisfaction scores and nomophobia levels are not significant (p >.05). However, taken together, independent variables have a significant moderate relationship with nomophobia (R = 0.581, p < .01). The regression model is statistically significant (F(5,445) = 45.401, p = .000, p <.05). According to the adjusted R-square value, which indicates how much of the dependent variable is explained by the independent variables, 33% of the variance in students' nomophobia levels is explained by subscales of digital addiction, social connectedness, and life satisfaction variables. Among the independent variables, social media addiction had a significant effect on the level of students' nomophobia levels (t = 12.556, p < .05), while game addiction (t = -0.532, p > .05), its effect on daily life (t = 0.673, p > .05), social

connectedness ($t = -0.629$, $p > .05$), and life satisfaction ($t = 1.173$, $p > .05$) had no statistically significant effect on students' nomophobia levels. The regression model established is as follows: Nomophobia Scores = 21.094 + 0.574* Social Media Addiction.

DISCUSSION

This study investigated whether the prevalence and level of nomophobia in university students differ according to their gender, duration of having a smartphone, daily usage time, and the number of daily checks of the smartphone. Also, the predictive power of three subscales of digital addiction, which are social media addiction, game addiction, and impact on daily life, as well as social connectedness and life satisfaction on the nomophobia levels of university students, was investigated. According to the findings, the nomophobia level of female university students is significantly higher than that of men, there is no significant relationship between nomophobia and the duration of having a smartphone, and those who had longer daily usage times and more daily checks had higher levels of nomophobia. Among the digital addiction subscales and social connectedness and life satisfaction variables, only social media addiction was found to be a significant predictor of nomophobia. The variance explained by the variables was found to be 33%.

In this study, as a result of the analysis made in parallel with the Nomophobia Scale level norm, 63.9% of the participants were moderately nomophobic, 19% were mildly nomophobic, and 17.1% were found to be highly nomophobic. In previous studies investigating nomophobia among Turkish university students in the literature, the prevalence of nomophobia among respondents was found to be 42.6% (Yıldırım et al., 2016), 54% (Erdem et al., 2017) and 40% (Mengi et al., 2020). The nomophobia rate was determined as 18.5% (Dixit et al., 2010) in a study conducted on Indian university students. In a second study conducted on Indian university students, the rate was 24.12% for those who were nomophobic and 40.97% for those who were at risk of becoming nomophobic (Prasad et. al., 2015). The rate in yet another study was 6% for those who were nomophobic and 79% for those who were at risk of becoming nomophobic (Kaur et al., 2015). In a more recent study, 17.5% of university students were found severely nomophobic, 56.3% moderately nomophobic, and 25.3% moderately nomophobic (Anusuya et al., 2021). Although the levels vary, as can be seen, the rates of nomophobia or the risk of developing nomophobia among university students are alarmingly high.

There are studies in the literature that show that women have higher levels of nomophobia than men (Arpacı, 2020; Erdem et al., 2017; Gezgin & Çakır, 2016; Güllüce et al., 2019; Leon et al., 2021; Schwaiger & Tahir, 2020). Unlike these findings, there are studies indicating that nomophobia does not differ according to gender (Adnan & Gezgin, 2016; Dixit et al., 2010) and that men have higher levels of nomophobia than women (Özdemir et al., 2018; Nagpal & Kaur, 2016). However, studies showing that women have higher nomophobia levels than men are more numerous in the literature. The findings of the current study support these results. Andone et al. (2016) stated that the daily usage time of women is longer than for men and that women use their phones for social media and communication purposes, while men use it more for playing games. Jenaro et al. (2007) found that women use their phones more to chat and maintain social relations. One study found that women's fear of losing connection and not being able to communicate was higher than for men (Güllüce et al., 2019). The reason why women have higher nomophobia levels could be explained by their being more relational than men (Sun et al., 2010). It is possible that women care more about being in a relationship and may use their smartphones more for this reason. However, this situation may also lead to an increase in women's nomophobia levels.

In the current study, no significant difference was observed in the nomophobia levels of students according to the duration of having a smartphone. In the literature, studies that have not found a relationship between the duration of having a smartphone and nomophobia (Adnan & Gezgin, 2016; Gezgin et al., 2017) exist, as well as those that reveal that students with a longer duration of smartphone ownership have a higher level of nomophobia (Güllüce et al., Sırakaya, 2018; Yıldırım et al., 2016). Since smartphones, which can provide increased convenience in daily life, can answer the needs of their users immediately, both new and old users may prefer to use them intensively. For this reason, having a smartphone for a longer time may not have caused a significant difference on nomophobia levels.

A significant difference was found in the nomophobia levels of the participants according to their daily smartphone usage time. The strength of this relationship is moderate according to the eta squared coefficient. Those who use their smartphones for 5-6 hours a day and 7 hours and above have significantly higher levels of nomophobia than those with 1-2 hours of daily usage; those who use their smartphones for more than 7 hours showed significantly higher nomophobia levels than those who use them for 3-4 hours. The fact that the increase in daily use is associated with an increase in nomophobia is consistent with the results of previous research (Dağlı et al., 2017; Erdem et al., 2017). Jilisha et al. (2019) stated that the duration of smartphone use is one of the main predictors of nomophobia in university students and that students use smartphones for reasons such as avoiding stressful situations, staying up-to-date, and maintaining communication. In addition to this explanation, it can be argued that as the number of undertakings that can be done via smart phones increases, the time spent with them also increases; later, the level of nomophobia rises as the connection established with the phone is strengthened. Looking at the issue from the framework of expanded self-theory, individuals can be told to see smartphones as an extension of their selves and attribute various meanings to these devices (Han et al., 2017). The strong connection between a person and his/her smartphone established after spending long periods of time together can cause intense feelings of deprivation when the person cannot have access to his/her smartphone. Therefore, it can be said that the increase in the duration of use brings about an increase in the level of nomophobia.

It was found in the current study that there is a significant difference in the nomophobia levels of the participants according to their daily smartphone checks. The nomophobia level of those who check their smartphones 11-20 times a day and 21 times or more is higher than in those who check their smartphones 1-10 times a day. In other words, those who check their phones more often have higher levels of nomophobia. This finding is consistent with previous research findings (Abraham et al., 2014; Güllüce et al., 2019). Walsh et al. (2010) found that young people frequently check incoming text messages and calls through notifications. Gezgin et al. (2017) explained this occurrence with the addiction-enhancing effect of repetitive behaviors and stated that frequent checks of a phone may lead to nomophobia. In addition, encountering a new stimulus every time a user checks his/her smartphone may increase motivation to control themselves. Each new item they encounter when they check their phone may act as a reinforcement for users.

According to the findings of this study, social media addiction, which is one of the subscales of digital addiction, has a moderate positive relationship with nomophobia, and it significantly predicts students' nomophobia levels. This result is parallel to the results of previous research in the literature (Ayar et al. 2018; Dağlı et al., 2017; Yıldız-Durak, 2018). Polat (2017) observing that the number of people who use their smartphones in order not to miss out on social media events is larger than the number of those who use it for communication purposes. Yılmaz (2019) found that social media is a means to suppress fears of

exclusion and dislike; it also satisfies feelings of belonging to a group and being affirmed, as well as a way to express identity. The fact that social media offers individuals opportunities such as starting a relationship, maintaining a relationship, creating events, participating in activities, and being aware of their surroundings might explain its intensive use. Especially recently, the fact that social media offers young adults new business alternatives or enables them to advertise their products inexpensively may also be what makes the use of social media more attractive. The idea of being away or distancing one's self from these opportunities may also lead to occurrences of nomophobia.

Although game addiction was found to have a low level of positive relationship with nomophobia, it was concluded that this relationship was not statistically significant. While there are studies in the literature that have not found a relationship between game addiction and nomophobia (Aktaş & Yılmaz, 2017; Eren et al., 2020), there are also some indicating that students with a high rate of online game playing also have high smartphone addiction levels (Gezgin et al., 2018; Çelik, 2019). Andone et al. (2016) concluded that younger participants use phones more for entertainment and social interaction and that this use becomes a more need-oriented one as age increases. Similarly, Arslan et al. (2015) concluded that high school students' level of game addiction is significantly higher than that of university students. It can be said that the use of smartphones for gaming is more popular among high school students than university students. University students, who are generally in a period of isolation versus intimacy, (Erikson, 1993) may tend to use their phones to access social media rather than play games. In other words, social media may serve more to the intimacy needs of university students.

Even though the effect on daily life subscale of digital addiction was found to have a moderately positive relationship with nomophobia, it was not found as a significant predictor of nomophobia. Studies have found that nomophobia has a positive relationship with low sleep quality, low academic achievement, attention problems, and social phobia (Arpacı, 2020; Kuşçu et al., 2020; Mengi et al., 2020, Prasad et al., 2017). It is an unexpected finding that no such significant relationship was found in this study. On the other hand, it is possible that university students do not negatively perceive the effect of smartphone use on their lives and therefore may have answered the items of the relevant scale based on this perception. The observation that university students do not have complaints about spending a long time on their smartphones brings this explanation to mind.

Another finding of the current study indicated that the social connectedness variable did not predict nomophobia. There are no studies dealing with the relationship between social connectedness and nomophobia in the literature. According to previous studies on similar issues, there is a positive relationship between social connectedness and internet addiction (Hırlak et al., 2016) and a negative relationship between social connectedness and problematic internet use (McIntyre et al., 2015; Yalçınkaya, 2019). Similarly, there is a negative relationship between a sense of belonging and nomophobia (Akşit-Aşık, 2018) and a positive relationship between belonging and smartphone addiction (Lei et al., 2017). As can be seen, the findings of the research dealing with the relationship between similar concepts differ from one another. Smart phones may be meeting the different social-emotional needs of individuals with low and high levels of social connectedness.

In this study, it was found that life satisfaction did not predict nomophobia. There are studies on the positive relationship between nomophobia and life satisfaction (Blachnio et al., 2018), the negative relationship between the two (Güllüce et al., 2019; Şengör, 2020), and also about how the two have no relationship at all (Özarslan, 2019; Samaha & Hawi, 2016; Sezer & Atılgan, 2019). Thus, it is possible to say that research

findings on nomophobia and life satisfaction are not consistent. Different features of smartphones may meet the needs of individuals with low, medium, or high levels of life satisfaction. Smartphones may have features that appeal to individuals with all and every level of life satisfaction. This might be why the life satisfaction level may not cause a significant difference in the level of nomophobia.

Conclusions and Limitations

For the current generation, who were born into technology and who have no internet-free memory, the internet has ceased to be one-sided and has become a place in which consumers can also produce and present products. Thus, social media has become especially important with regard to smartphone use. It is thought that the increase in the level and rates of nomophobia will continue due to the effect of the decrease in the age of being introduced to and owning a smart device, the increase in the prevalence of smartphones, and the increase in screen exposure during the epidemic period. For this reason, it has become even more necessary to conduct studies to reduce the level of nomophobia or to prevent nomophobia, in addition to the studies exploring the disorder's numerous negative effects. According to the results of the current study, nomophobia increases as the duration of daily use and the number of daily checks increase. It is therefore important to conduct studies on what smartphones mean to young people and which social and emotional needs they are related to. In this respect, qualitative research can provide new perspectives and insight. In addition, it is essential to scrutinize which needs of university students social media responds to. It is of great importance to determine which individual needs are related to the use of smartphones to the extent that they prevent living in the moment, seeing and feeling what is happening around them, and establishing real and face-to-face relationships. Determining the reasons why there is a failure to follow up on how social media increases nomophobia can also be understood by qualitative research studies. Furthermore, intervention programs that will reduce the nomophobia levels of university students are necessary. Psychological counseling and guidance centers in universities can conduct informative and preventive psycho-educational activities on smartphone use and nomophobia.

As in all academic works, this study has some limitations. The generalizability of the results is limited to similar student groups as the data were obtained from volunteers in pre-determined classes through convenient sampling. The digital addiction variable has been handled within the framework of the dimensions found in the scale selected within the scope of this research. In new studies, measurement tools that include other types of digital addiction can be used to see the effect of different digital addictions on nomophobia. In this study, it was determined that the percentage of social media addiction explaining nomophobia was relatively high. Which qualities of social media increase the level of nomophobia can be handled with qualitative research methods. The data were obtained from three different universities in a single province. Similar studies could later be conducted on students studying at different universities or on individuals of different age groups and different socio-cultural backgrounds.

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Author Contribution

This study was conducted by all the authors working together and cooperatively. All of the authors substantially contributed to this work in each step of the study.

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