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Abstract

This study looks into the relationship between nomophobia and loneliness, and the effects of smartphone and mobile internet use among adolescents. A total of 301 adolescents were employed for the study and the data were collected via Nomophobia (NMP-Q) and UCLA Loneliness Short-Form (ULS-8) Scales. The study was conducted in a relational survey model using descriptive statistics, ANOVA, Pearson correlation, and linear regression. According to the findings the levels of nomophobic behaviors of adolescents were at a moderate level. While there was not a statistically significant correlation in terms of the duration of smartphone ownership and monthly mobile internet GSM quota, a significant difference was found in terms of the duration of mobile internet ownership, the duration of daily mobile internet use, and daily smartphone checking time. Finally, there was a statistically significant relationship between nomophobia and loneliness, and it can be ascertained that loneliness of adolescents predicts their nomophobia levels to a certain extent.

Introduction

The development of technology has pioneered considerable differences in people's lives, especially over the past few years. More particularly in tandem with an increase in the prevalence of mobile phone use, certain side effects related to overuse of mobile phones have come into the picture. Among those, No Mobile Phone Phobia (nomophobia) might be regarded as one of the problems (Bragazzi, & Puente, 2014; King et al., 2013) experienced by a society, thereby becoming a studied subject in a number of developed countries (Adnan, & Gezgin, 2016; Ali et al., 2017; Dasgupta et al. 2017; Gezgin, & Cakir, 2016; Hoşgör, Tandoğan, & Hoşgör,2017 ;Nawaz, Sultana, Amjad, & Shaheen, 2017; Sharma, Sharma, Sharma, & Wavare, 2015). Nonetheless, relatively few studies have been conducted in countries which can be listed under the category of developing countries such as Turkey. Moreover, studies on nomophobia have always been based on the behaviors and usage of the mobile phone, yet literature demonstrate that few studies have examined the relationship between psychosocial risks (loneliness, stress, depression and, anxiety etc.) and nomophobia. Bearing these gaps in the literature in mind, the aim of the present study is to determine the relationship among nomophobia and loneliness and the nomophobia prevalence with regards to smartphone and mobile internet use among adolescents.

Walsh, White and Young (2008) express that it is not surprising that some young people are extremely attached to their mobile phone considering the integration of mobile phone on people's lives and the number of its functions. Smartphones, distinct from standard mobile phones in terms of their operating system and the fact that they are equipped with more advanced 3G or 4G features and capabilities (e.g., socializing on Facebook and viewing/posting video on YouTube), have rapidly been gaining considerable popularity worldwide (Bian, & Leung, 2014). Although the factors which provide this popularity might vary from culture to culture (Shin & Choo, 2012), it can be stated that wireless technology is a leading cause of this popularity. To exemplify, according to "Responsible Internet Usage Research" pioneered by Google in January 2015 with 13500 students in İstanbul, the results demonstrate that 75% of the participants use their smartphones for internet connection. The same report indicates that the rate of using mobile phones for internet connection is 61% among students aged 14 and below. This rate increases to 80% among students aged 17 and above (Google, 2015). This study reveals that smartphone use is strongly associated with wireless technologies.

The results of Google's study indeed stresses the prevalence of wireless technologies and according to Falaki et al. (2010), the more smartphone use is adopted, the greater the implications for the provisioning of wireless networks can be observed. Yet, the development of wireless technologies means that people can have access to free internet connection in Wi-Fi areas via their smartphones more easily (Park & Lee, 2011). This results in the

improvement of wireless technology and in turn promotes the use of smartphones all over the world. For example, according to the We Are Social Report (2016), individuals with smartphones make up 56% of Turkey's population, and the number of active mobile social network users has reached 36 million people, in other words 45% of the population, in Turkey. Furthermore, the number of people using social media actively on their mobile devices has increased by 13% percent over the last one year in Turkey. Therefore, it might seem fair to say that people are now migrating to mobile devices for socialization, entertainment, and other needs.
Besides their countless roles in individuals' lives, smartphones do not only have functions and features like verbal communication, but also have other applications such as texting (e.g., WhatsApp, WeChat), which provides functions for social networking (Bian & Leung, 2014). Falaki et al. (2010), for example, classify the applications that are used on smartphones into eight categories: a) communication (e.g., email, SMS, IM) and voice calls; b) browsing (web browser, search, and social networking applications); c) media (e.g., pictures, music, videos); d) productivity (e.g., Office, PDF reader); e) system (e.g., file explorer); f) games; g) maps; and h) others, and Taner (2014) states the users' smartphone evaluations in five factors: a) social need, b) social pressure, c) facilitation of life, d) addiction, e) buying behavior. These classifications demonstrate that smartphone use has many benefits although the aims for it might change according to users.

Though the profile of users might vary, smartphones are commonly used by especially the people who are in search of socialization and the sense of being liked (Pavithra & Madhukumar, 2015). Gezgin and Cakir (2016) similarly revealed that the smartphones and mobile internet usage are there largely for social networks, music, communication, photographs, education, research, games and videos. However, although it is clear that using the smartphones might provide convenience to people - especially to young people in every part of our lives such as; connecting to the Internet, taking photos, listening to radio and music, following the news, finding addresses and route, making reservations, banking, shopping, playing games etc. (Gezgin et al., 2017)-, this technological device also causes people to change their lifestyles, differentiate their social relationships and limit their lives to this technological world (Yilmaz, Sar, & Civan, 2015).

The discourses mentioned above offer a strong evidence for the fact that mobile technologies have also negative effects despite their advantages. According to George and Odgers (2015), mobile technologies trigger the following seven fears: concerning about whom users interact with online, cyberbullying, offline socialization experiences and friendships, digital divide between parents and adolescents, damaging sense of self and identity, potential risks for cognitive performance and sleep (George & Odgers, 2015). On the other hand, some of the disadvantages of overuse cell phone usage include hindering classroom performance, distraction and an annoyance to fellow classmates and instructors, because of the lack of attention, increasing dropout rates, and fewer graduates for students, the anxiety students experience because of their constant need to have their phone on them at all times (Jesse, 2016). Therefore, it can be claimed that multiple psychological effects emerge from smartphone ownership and usage (Jesse, 2016). To exemplify, Bian and Leung (2014) found that the higher one scores in loneliness, the higher the likelihood one would be addicted to smartphones. Based on these discourses, it is clear that uncontrolled overuse and problematic usage of mobile technologies cause psychological disorders or increase symptoms (Bian & Leung, 2014; Balta & Horzum, 2008; Chòliz, 2012). The recent study conducted by Argumosa-Villar, Boada-Grau and Vigil-Colet (2017) support these claims as focusing on the effects of psychological variables such as personality self-esteem, extraversion, conscientiousness and emotional stability on nomophobia. For this reason, this study regards nomophobia in terms of loneliness which is a psychological variable. In this context, this study addresses two terms "loneliness" and "nomophobia" - a new psychological terminology- existing nowadays, due to overuse and problematic usage of mobile phone.

Literature Review

No Mobile Phone Phobia (nomophobia), the fear and anxiety which an individual experiences in the absence of a mobile phone, is considered to be one of the negative effects brought by technology in the modern age. Aspiring to connect might cause people to be enthroned of smartphones. Because of this reason, people might have psychological problems due to not being able to have their phones and connect by phone. Although there is not enough data about people's personality who have this phobia, according to (Algul, 2014), this syndrome is rather common among people.

The findings from the studies conducted in different cultures (e.g. Chóliz, 2012; King et al., 2013; Oksman & Turtiainen, 2004; Sharma et al., 2015; Tavolacci et al., 2015; Toda et al., 2006) reveal how common and up-to-date the nomophobia is worldwide despite the fact that it is not literally present in the literature. Although nomophobia does not appear in the current DSM-V (Diagnostic & Statistical Manual of Mental Disorders, 5th Ed), it is proposed as a "specific phobia", based on definitions given in the DSM-IV (Bragazzi, & Puenete,

2014). For this reason, nomophobia is considered as a modern age phobia that is introduced to our lives as a by-product of the interaction between people and mobile information and communication technologies, especially smartphones (Yildirim & Correia, 2015, p. 130). The increased use of mobile internet results in increased levels of nomophobia (Gezgin, Cakir, & Yildirim, 2017).

Studies conducted in various countries indicated that nomophobia increases in such a way that it cannot be ignored, especially among young people (e.g. Cheever et al., 2014; Dixit et al., 2010; Kaur & Sharma, 2015; Pavithra & Madhukumar, 2015; Sharma et al., 2015). One of the main reasons for this prevalence is thought to be the increase in the prevalence of smartphones (Yildirim & Correia, 2015). On the other hand, when the studies conducted in the Turkish context (Adnan & Gezgin, 2016; Akilli & Gezgin, 2016; Erdem et al., 2016; Gezgin & Cakir, 2016; Uysal, Ozen & Madenoglu, 2016; Yildirim et al., 2016) are examined, it can be corroborated that the prevalence of university students is higher and they have nomophobic behavior, at the same time the high school students' nomophobia levels are also above moderate levels. In addition, this phenomenon has also been seen as a risk among adolescents in general and not only among university and high school students.

Loneliness is defined as the unpleasant experience that occurs when a person's networks of social relations is deficient in some important way, either quantitatively or qualitatively (Perlman & Peplau, 1981, p.31), an experience involving a total and often acute feeling that constitutes a distinct form of self-awareness signaling a break in the basic network of the relational reality of self- world (Sadler & Johnson, 1980, p. 39), and a developmental risk factor for future well-being during childhood which affects current quality of life of the individual and a distressing affective experience (Margalit, 2010). People can also feel lonely without being alone or alone in a crowd (Peplau & Perlman, 1976). Lonely people spend less time on social activities and are mostly alone (Spitzberg & Canary, 1985), and tend to talk less, and their attention and accession levels are highly low (Solano, Batten, & Parish, 1982).

Considering the abovementioned features of lonely people, loneliness has frequently been studied by several researchers in recent years. Previous studies in the literature found a significant relationship between loneliness and deficits in social interaction (e.g. Spitzberg & Canary, 1985); loneliness and problematic excessive use of smartphone (e.g. Billieux, 2012) or different called such as mobile phone addiction, smartphone addiction (e.g. Park, 2005; Bian & Leung, 2014); loneliness and addictive use of the Internet (e.g. Engelberg & Sjoberg, 2004; Morahan-Martin, 2005), loneliness and internet dependency (e.g. Nalwa & Anand, 2003); loneliness and depression (e.g. Koenig and Issacs, 1994); loneliness and shyness (e.g. Erozkan, 2009); loneliness, school avoidance, and social dissatisfaction (e.g. Ladd, et al., 1997), and loneliness and sense of belonging to school (e.g. Mouratidis & Sideridis, 2009). For example, Engelberg and Sjoberg (2004) put forward that lonely people with poorer social skills tend to use the Internet more frequently. Nalwa and Anand (2003) similarly reported that individuals who scored higher on the loneliness scale in their study were more internet-dependent. Additionally, Bian and Leung (2014) discussed that mediated communication such as texting or social network sites was attractive to lonely people.

As shown above, the studies on loneliness and smartphone use abound. Nevertheless, to the best of the researchers' knowledge, there are no studies focusing directly on the relationship between loneliness and nomophobia. However, although there are several definitions of loneliness, Peplau & Perlman (1976, p.4) point at three aspects among them: Firstly, loneliness is a result from deficiencies in a person's social relationships. Secondly, loneliness is not synonymous with objective social isolation, and is a subjective experience, and finally the experience of loneliness is unpleasant and distressing. In this context, it can be claimed that nomophobia and loneliness are similar in terms of these features. Yet, nomophobia is the fear of deficiency, subjective perception and kind of addict which can cause anxiety. For this reason, it will be useful to bring the possible relationship between nomophobia and loneliness to light.

The Possible Relationship between Nomophobia and Loneliness

People have discovered new ways of staying connected with the people in their environment. To illustrate, if they are going to meet their friends, the duration of walking down the street to meet someone has decreased because most people now simply text their friends to communicate, and, when friends are simply a click away, they feel secure and safe, which is a basic human need (Jesse, 2016). In fact, even if this situation in which people are increasingly attached to their phones is gradually increasing the virtual communication, it can be thought that it makes them isolated from the real world order. However, Bian and Leung (2014) state that smartphone use lets people avoid communicating with others face-to-face or even by voice, and escape from

uncomfortable situations while in public and indulge in a virtual, private mobile computing environment. In this sense, it can be claimed that overuse of smartphone and nomophobia as a result of this might correlate with loneliness.

Furthermore, interpersonal relationships have long been affected by technological developments (Jesse, 2016). According to Townsend (2000), the basic purpose of mobile phones is to allow people to be present in two different places to communicate instantly, eliminating the primary human anxiety about loneliness (Cit. Bian & Leung, 2014). Therefore, it can be claimed that there can be a relationship between the mobile phone use and loneliness levels of people because of its benefit for removing anxiety for feeling lonely. Yet, there were more than 3.2 billion individuals who used the internet regularly, equivalent to nearly 45% of the world's population, and about 2.5 billion people, or three out of every four internet users, will access the web via mobile phone by the end of 2016 (EMarketer, 2016). While phone or smartphone ownership in households in Turkey was 96.9% in 2016, it was reported that the amount of internet use was the highest at 16-24 age range (TUIK, 2016). In context, following the widespread mobile internet access, widespread ownership of mobile phones and addiction behavior on the Internet and smartphones of the users, the present study emphasizes the importance of identifying the potential relationship between feeling of nomophobia and loneliness among adolescents.

The seriousness of nomophobia is actually more than it is thought. To exemplify, Synovata (2009) conducted interviews with more than 8000 participants with respect to the use of mobile phone, and the results showed the following: 75% of the participants stated that they would not leave home without getting their mobile phones; more than 36% of the participants indicated that they could not live without their mobile phones; 42% articulated that they left their phones nearby even during their sleep, and finally 36% of them stated that they did not want to turn their phones off while sleeping because they were afraid of missing something at night (Cit. Yilmaz, Sar, & Civan, 2015). In line with Synovata's (2009) results by stressing the prevalence of smartphones, Lee et al. (2014) put forward that smartphones are now more than just means of communication. They further indicate that smartphones affect human life in many different ways, especially due to the fact that they are the devices which are in closest daily physical contact with individuals, and the highest nomophobia rate was stated as 77%, among 18-24 age range (SecurEnvoy, 2012).

Regarding the reports on the use of the internet and high rate of smartphone ownership among adolescents, it therefore might be necessary to consider adolescents' feelings of loneliness and their nomophobia levels. Adolescents tend to access the internet via their smartphones, tablets and computers everywhere and whenever they want to get on social networks, play games, communicate with others etc. via mobile internet. Furthermore, they are more likely to use texting or other social environments in contrast to having face-to-face communication (Walsh, White & Young, 2008). Phillips, Ogeil, and Blaszczynski (2011)'s study perpetuates that the rate of owning a mobile phone among adolescents and teenagers is 76%, and 40% of them own a second mobile phone. Moreover, Park and Lee (2012), from a psychological perspective, note that using smartphones may increase loneliness among adolescents. In light of these findings, researchers anticipate that adolescents who will score higher on the loneliness scale will likely to have more nomophobia feelings. Considering the fact that adolescents are reluctant to talk to others face-to-face, they tend to communicate with people via texting or other social networking applications on smartphones.

Nomophobia is now being addressed by researchers as an issue that is increasingly prevalent as well as a subject whose effects need to be investigated. Accessing the internet easily with mobile phones is the main effect of this phobia (Algul, 2014). Although earlier studies paid somewhat more attention to the prevalence of nomophobia (e.g. Adnan & Gezgin, 2016; Akilli & Gezgin, 2016, Gezgin & Cakir, 2016; Yildirim & Correa, 2015; Yildirim et al., 2016), its effect on academic success (e.g. Erdem et al., 2016), description as a behavioral addiction (Sar, Ayas, & Horzum, 2015) and its effect on social phobia (e.g. Uysal, Ozen & Madenoglu, 2016), no studies heretofore have specifically explored nomophobia from a psychological perspective. However, researchers thought that the reason of the nomophobia which is a wen nowadays is the feelings of loneliness, isolation and fear triggered by modern era (Algul, 2014). Especially, considering the use of the internet and the ownership of smartphones, and psychological symptoms of adolescents, this study might provide insights to identify the effects of the feeling of loneliness on nomophobia levels among adolescents. According to Gasser and Palfrey (2008), adolescents in the current generation are unique in that they are "born digital"; that is, most do not recall any period without having access to the Internet and mobile devices (George & Odgers, 2015). Thus, the aim of this study is to investigate the relationship between nomophobia and psychological perspectives such as loneliness among Turkish adolescents. Following on the statements given above, this study focuses on the following:

1. Is there a significant difference in adolescents' nomophobia levels in terms of

    a. Duration of smartphone ownership,
    b. Duration of daily smartphone checking time,
    c. Duration of mobile internet ownership,
    d. duration of daily mobile Internet use,
    e. Monthly mobile internet GSM quota?

2. Is there a significant relationship between adolescents' nomophobia and loneliness levels?
3. Does loneliness predict nomophobia among adolescents?

Methodology

In the study, the survey method was used to determine differences between adolescent groups according to various variables in terms of nomophobia. In addition, relational survey method was used to examine the relationship between nomophobia prevalence and loneliness among adolescents. The surveying model is a kind of approach aiming to describe a situation with its existing facts, and the purpose of this model is making a description by depicting the existing state about the research topic (Cohen, 1988). In survey studies, no effort is made to change and influence the fact, which is the subject of the study. The distribution of the participants in the sample is more important than the reasons of properties and opinions (Fraenkel & Wallen, 2006). Data needed for the relational surveying model was obtained from the individuals in the target population of the study by using measurement tools.

Data Collection Tools

Nomophobia Scale (NMP-Q)

A Nomophobia Scale (NMP-Q), which was developed by Yildirim and Correia (2015) and adapted to Turkish by Yildirim et al (2016), was administered in the study. The scale is a 7 point Likert Type scale and has a total of 20 items. The Cronbach's Alpha reliability coefficient of the original scale was .95, and the reliability coefficient of Turkish version was .92. The scale has mainly four sub- dimensions: Not Being Able to Access Information (4 items), Losing Connectedness (5 items), Not Being Able to Communicate (6 items) and Giving up Convenience (5 items).

In the original scale, the reliability coefficients of these sub-dimensions were, .94, .87, .83 and .81 respectively. The reliability coefficients of the scale were reported as .90, .74, .94 and .91. Cronbach Alpha Internal Consistency Coefficient was found as .91 for the reliability of the study. The Cronbach alpha value of .70 and above indicates that the data collection tool used is reliable (Pallant, 2005). In addition, the reliability coefficients of these sub-dimensions were found to be .83, .79, .85, and .87 respectively. NMP-Q scores are interpreted as follows: an NMP-Q score of 20 indicating the absence of nomophobia; an NMP-Q score greater than 20 and less than 60 corresponding to a mild level of nomophobia; an NMP-Q score greater than or equal to 60 and less than 100 corresponding to a moderate level of nomophobia; and an NMP-Q score greater than or equal to 100 corresponding to a severe nomophobia (Yildirim & Correia, 2015).

UCLA Loneliness Scale Short-Form (ULS–8)

Developed by Hays and DiMatteo (1987) and adapted into Turkish by Yildiz and Duy (2014), the UCLA Loneliness Scale consists of seven items and one dimension carrying the same name with the scale. Participants were presented with a series of questions such as "How often do you feel isolated from others?" with response options on a 4-point scale ranging from 1 (never) to 4 (always). The internal consistency coefficient of the scale was .74 and the test-retest reliability coefficient was .84. Among seven items, only one item of the scale was scored reversely. The scores that can be obtained from the scale range from 7 to 28. The high scores obtained from the scale indicate a high level of loneliness (Yildiz & Duy, 2014). Cronbach Alpha Internal Consistency Coefficient was found as .77 for the reliability of the study.

The Demographic Information Form

The demographic information form which was developed by the researchers seeks for the information about gender, age, duration of smartphone ownership, duration of daily smartphone checking time, duration of mobile internet ownership, duration of daily mobile internet use and monthly mobile internet GSM of the participants.

The Study Group

The population of this study had approximately 5200 active users who own a smartphone and use the online social network applications monthly between 13 and 19 years (M=17.82, SD=1.72). The study group consisted of 301 Turkish adolescents selected with convenience sample method. The socio-demographic characteristics of the participants are presented in Table 1.

Table 1. Socio-demographic characteristics of the participants

Gender	N	%
Male	291	96.6
Female	10	3.4
Duration of Smartphone Ownership	N	%
Less than 1 years	31	10.3
1-2 years	60	19.9
2-3 years	65	21.6
3-4 years	72	23.9
More than 4 years	73	24.3
Daily Smartphone Checking Time		
1-16 times	86	28.6
17-32 times	58	19.3
33-48 times	59	19.6
More than 49 times	98	32.6
Duration of Mobile Internet Ownership		
Less than 1 years	56	18.6
1-2 years	75	24.9
2-3 years	65	21.6
3-4 years	48	15.9
More than 4 years	57	18.9
Duration of Daily Mobile Internet Use		
Less than 1 hours	72	23.9
1-2 hours	84	27.9
2-3 hours	54	17.9
3-4 hours	30	10.0
More than 4 hours	61	20.3
Monthly Mobile Internet GSM Quota		
Less than 1 GB	31	10.3
1-2 GB	109	36.2
2-3 GB	65	21.6
3-4 GB	35	11.6
More than 4 GB	61	20.3
Total (N=301)		

Note. N=sample size.

Data Collection and Analysis

For this study, data collection was done online. The message from the researchers to the volunteers who were social network users was that they were expected to participate and a form was provided for collecting responses digitally. The participants used a link provided to access the form. In addition, they were rewarded with a digital product that could be used in the social network application. The analysis was done by using SPSS 23.0 (The Statistical Package for the Social Sciences. Kolmogorov-Smirnov test was used to control normal distribution and it was found that normal distribution values were smaller than the level of statistical significance ($p<0.05$).

The Kurtosis and Skewness coefficients of the factors were calculated for the normality condition of the parametric tests. The fact that the coefficients of skewness and kurtosis remain within the range of -1 to +1 indicate that the scores have a normal distribution (Huck, 2012). The skewness and kurtosis coefficients of the mean scores of the subscales of the scale are given in Table 2.

Table 2. Nomophobia scale and sub dimension' skewness and kurtosis coefficients

	Not Being Able to Access Information	Losing Connectedness	Not Being Able to Communicate	Giving up Convenience	Nomophobia Total	Loneliness Total
Skewness	.190	.102	.032	.437	.528	.444
Kurtosis	-.997	-.813	-.823	-.729	.018	.028

When Table 2 is examined, it is seen that the skewness and kurtosis values of the mean scores of the factors yield a normal distribution.

Findings

The findings of this study are discussed and presented under appropriate subheadings to relate to the questions stated. Based on the mean scores (M=3.97, SD=1.37) obtained from Nomophobia Scale, it was discovered that nomophobia levels of high school students were a bit higher than average. When the sub-dimensions of the scale were examined, it was seen that the scores obtained from the sub-dimensions of Not Being Able to Access Information (M= 3.96, SD=1.87), Losing Connectedness (M= 4.02, SD=1.70) and Not Being Able to Communicate (M=4.38, SD=1.70) were above the average. Only the score obtained from the dimension of Giving up Convenience (M=3.43, SD=1.82) was below the average (see Table 3).

Table 3. Means and standard deviations of the scales and sub-dimensions

		Min	Max	*M*	SD
Nomophobia Scale (NMP-Q)		1.00	7.00	3.97	1.37
Nomophobia Scale sub-dimensions	Not being able to access information	1.00	7.00	3.96	1.87
	Losing connectedness	1.00	7.00	4.02	1.70
	Not being able to communicate	1.00	7.00	4.38	1.70
	Giving up convenience	1.00	7.00	3.43	1.82
Loneliness Scale (ULS-8)		1.00	4.00	2.06	.62

Duration of Smartphone Ownership

One-way ANOVA was performed to examine whether there was any difference in nomophobia levels of adolescents according to their smartphone ownership. The results showed that there was no significant difference in nomophobia levels of social network users according to duration of their smartphone ownership ($F(4,296) = 1.288$, $p=.27$). These findings suggest that the number of years of the ownership of a smartphone has no impact on Nomophobia.

Table 4. One-way ANOVA test results with regards to duration of smartphone ownership

	Duration of Smartphone Ownership	N	M	SD	F	p
Nomophobia	Less than 1 years	31	3.73	1.35	1.288	.27
	1-2 years	60	3.76	1.06		
	2-3 years	65	3.86	1.49		
	3-4 years	72	4.08	1.27		
	More than 4 years	73	4.19	1.56		
	Total	301	3.96	1.37		

Daily Smartphone Checking Time

One-way ANOVA was performed to examine whether there is a difference in nomophobia levels of adolescents according to the frequency of checking Smartphones each day. The results showed that there was a significant difference in nomophobia levels of social network users according to their frequency of checking smartphone (F (3,297) = 6.349, p=.00). To investigate which groups differ from each other Tukey follow up test was performed. Tukey HSD test results revealed that, there was a significant difference in favor of the group their smartphones more than 49 times (M=4.41, SD=1.44) a day compared to the groups between 1-16 (M=3.67, SD=1.31) and 17-32 times (M=3.60, SD=1.17). Hence, it can be stated that increase in the daily smartphone checking time increases nomophobia level among adolescents.

Table 5. One-way ANOVA test results with regards to the frequency of checking smartphone daily

	Daily Smartphone Checking Time	N	M	SD	F	p	Tukey HSD
Nomophobia	1-16 times	86	3.67	1.31	6.349	.00*	D>A, D>B
	17-32 times	58	3.60	1.17			
	33-48 times	59	4.02	1.35			
	More than 49 times	98	4.41	1.44			
	Total	301	3.96	1.37			

*Note. *p < .05; A: 1-16 times, B: 17-32 times, C: 33-48 times, D: More than 49 times*

Duration of Mobile Internet Ownership

One-way ANOVA was performed to examine whether there is a difference in nomophobia levels of adolescents according to their duration of mobile internet ownership and the results demonstrated that there was a significant difference in nomophobia levels of social network users according to mobile internet use in years (F(4,296) =2,896, p=.02). To investigate which groups differed from each other, a Tukey follow up test was performed. According to the findings, there was a difference between the participants who were using the mobile internet more than 4 years (M=4.44, SD=1.31) and the ones using it less than a year (M=3.71, SD=1.41). In addition to this, there was a difference between the participants using the mobile internet more than 4 years and the ones using it for 1-2 years(M=3.78,SD=1.03). These differences were in favor of the participants using the mobile internet more than 4 years (M=4.44, SD=1.31) in terms of their nomophobia levels. The findings show that the internet access time a mobile phone contract allows correlates with the level of nomophobia. Hence, it is the monthly duration of mobile access to the Internet that matters and not necessarily the smartphone itself.

Table 6. One-way ANOVA test results with regarding to mobile internet ownership in years

	Duration of Mobile Internet Ownership	N	M	SD	F	p	Tukey HSD
Nomophobia	Less than 1 years	56	3.71	1.41	2.896	.02*	E>A,E>B
	1-2 years	75	3.78	1.03			
	2-3 years	65	3.91	1.42			
	3-4 years	48	4.01	1.10			
	More than 4 years	57	4.47	1.31			
	Total	301	3.96	1.37			

*p < .05; A: Less than 1 years; B: 1-2 years; C: 2-3 years; D: 3-4 years; E: More than 4 years

Duration of Daily Mobile Internet Use

One-way ANOVA was performed to examine whether there was a difference in nomophobia levels of adolescents according to their duration of daily mobile internet use. The results showed that there was a significant difference in nomophobia levels of social network users according to mobile internet use in years (F (4,296) =8.655, p=00). To further investigate which groups differed from each other, a Tukey follow up test was performed. According to the findings, the nomophobia prevalence was higher among the participants using internet for 2-3 hours (M=4.17, SD=1.47), 3-4 hours (M=4.59, SD=1.57) and more than 4 hours (M=4.34, SD=1.48) than daily use mobile internet less than 1 hour (M=3.39, SD=1.16). There was also a significant difference between 3-4 hours (M=4.59, SD=1.57) and 1-2 hours (M=3.75, SD=1.03) daily users of the Internet

in favor of 3-4 hours. The findings show that adults accessing the Internet through their smartphone on daily basis have higher levels of nomophobia.

Table 7. One-way ANOVA test results with regarding to daily mobile internet use.

	Duration of Daily Mobile Internet Use	N	M	SD	F	p	Tukey HSD
Nomophobia	Less than 1 hours	72	3.39	1.16	8.655	.00*	E>A, D>A, D>B, C>A
	1-2 hours	84	3.75	1.03			
	2-3 hours	54	4.17	1.47			
	3-4 hours	30	4.59	1.57			
	More than 4 hours	61	4.34	1.48			
	Total	301	3.96	1.37			

*p < .05; A: Less than 1 hour; B: 1-2 hours; C: 2-3 hours; D: 3-4 hours; E: More than 4 hours

Monthly Mobile Internet GSM Quota

One-way ANOVA test was used to examine significant changes in the means of nomophobia score according to mobile internet quota. Findings revealed that there was no significant difference in the mean scores of Nomophobia Scale based on monthly mobile internet GSM quota, (F (4,296) =1.851, p=.12). It can then be concluded that the GSM quota of a mobile phone contract has no impact on nomophobia. It must be noted that the widespread use of Wi-Fi networks means that the time such networks are used may be important for nomophobia, too.

Table 8. One way ANOVA test results according to monthly mobile internet gsm quota

	Monthly Mobile Internet GSM Quota	N	M	SD	F	p
Nomophobia	Less than 1 GB	31	3.69	1.26	1.851	.12
	1-2 GB	109	3.77	1.34		
	2-3 GB	65	4.09	1.26		
	3-4 GB	35	4.36	1.46		
	More than 4 GB	61	4.08	1.48		
	Total	301	3.96	1.37		

*p < .05; A: Less than 1 GB; B: 1-2 GB; C: 2-3 GB; D: 3-4 GB; E: More than 4 GB

Findings on the relationship between the prevalence of nomophobia and loneliness

Spearman's correlation analysis technique was used to examine whether there was a relationship between loneliness and the prevalence of nomophobia among adolescents, which was discussed within the scope of this study.

Table 9. Pearson correlation matrix on the relationship between nomophobia and loneliness

	Nomophobia Total	Not being able to access information	Losing connectedness	Not being able to communicate	Giving up convenience	Loneliness Total
Nomophobia Total	1	.728**	.827**	.773**	.791**	.444**
Not being able to access information	-	1	.496**	.407**	.460**	.306**
Losing connectedness	-	-	1	.512**	.586**	.352**
Not being able to communicate	-	-	-	1	.414**	.253**
Giving up convenience	-	-	-	-	1	.479**
Loneliness Total	-	-	-	-	-	1

*Not. *. Correlation is significant at the 0.05 level, **. Correlation is significant at the 0.01 level.*

Based on the findings, a positive significant relationship at a moderate level was found between loneliness and the prevalence of nomophobia (r=.44, p<0.01). In light of these findings, it can be proposed that the higher the loneliness gets the more nomophobic behaviors subjects tend to exhibit. A correlation coefficient of 0 to 0.29 is considered low; correlations of 0.30 to 0.69 are considered moderate; correlations between 0.70 and 1.0 are considered strong (Warner, 2008). The Pearson r = .444 and the significance value of .00 lower than .01 indicate the statistical significance. Table 9 shows a moderate level relationship between the level of loneliness, and the total score of the nomophobia scale and its dimensions.

Findings on the simple linear regression analysis between nomophobia and loneliness

Linear simple linear regression analysis was performed to determine how loneliness predicted adolescents' nomophobia. The results of the analysis are shown in Table 10.

Table 10. Linear regression using total loneliness to predict total nomophobia

Variables	B	SE	B	t	p
Nomophobia Total (Constant)	1.97	.24		8.09	.00**
Loneliness Total	.97	.11	.379	8.57	.00**

*Not.**p<.01 $F_{(1-299)}$ =73.568, R=0 .444, R^2 =0.197*

This study revealed a moderate but significant level of correlation between nomophobia and loneliness (R= .444, p<.05) and loneliness regresses about 20 percent of nomophobia (R^2=.197, $F_{(1-299)}$ =73.568, p<.05).

Discussion

This study attempted to establish the relationship between the level of loneliness and the level of nomophobia affecting adults using social networks. The findings reveal that monophobia affects adults at moderate levels. The findings confirm the results of similar studies conducted in Turkey, using different sample groups. For example, two different studies that were carried out with the participation of 475, and 929 adults respectively revealed that younger generations are more affected by nomophobia (Gezgin & Cakir, 2016). Again, as found in this study and reported in other studies using the same scale, inability to communicate and inability to access information matter a lot to young generations (Yildirim et al., 2016; Gezgin et al., 2017; Gezgin & Cakir, 2016). Various reports across the world using different sample sizes also stress the significant increase in nomophobia amongst young people (Cheever et al., 2014; Dixit et al., 2010; King et al., 2013; Kaur & Sharma, 2015; Oksman & Turtiainen, 2004; Pavithra & Madhukumar, 2015; Sharma et al., 2015; Tavolacci et al., 2015).

Duration of Smartphone Ownership

No significant difference was found between the length of smartphone ownership and nomophobia among adults in this study. The findings of earlier studies which employed adults (e.g. Gezgin & Cakir, 2016; Gezgin, Cakir, & Yildirim, 2016) and university students (e.g. Adnan & Gezgin, 2016) also reported similar findings. To make it clear, in their study conducted among different age groups playing games on social media with 1151 participants, Gezgin, Şahin and Yildirim (2017) reported that there were no differences between nomophobia levels in relation to the duration of the use of smartphones. However, studies stating the opposite are also present in the literature. Gezgin et al. (2017) state that when two groups of prospective teachers with smartphone ownership of under a year, and over five years respectively were compared, it was found that the latter group had higher levels of nomophobia. There are also other studies reporting that the length of ownership of smartphones increases the level of monophobia (Yildirim & Correia, 2015; Yildirim et al., 2016).

Research findings exhibit differences when the duration of ownership of smartphones and the level of nomophobia amongst participants is considered. Hence, it is important to conduct further research on nomophobia with older generations and larger samples. It is thought that as the duration of ownership increases people tend to have increasing numbers of friends on social media, as a result, being out of smartphone contact and hence inability to reach friends increases the level of nomophobia. In this study, the findings reflected the fact that participants were more or less in the same age group.

Duration of Daily Smartphone Checking Time

The study shows significant differences in level of nomophobia adults suffer from and the frequency of checking their phones during daytime. Individuals checking their phones more frequently exhibit more nomophobic behavior. Walsh, White and Young (2010) report that young people check missed calls, SMS, and alerts frequently. According to Pavithra and Madhukumar (2015), the behavior and habit of checking the phone screen is one of the characteristics of mobile phone addiction and nomophobia. It is also believed that the need for an individual to be valued by others (liking what the individual shares, having his/her profile looked at, receiving messages), he/she keeps in touch with is related to the frequency of checking smartphones. In a report on Global Mobile Users published by the international advisory firm Deloitte Global based on research involving 18-50 year old mobile phone users in Turkey, it is reported that the participants look at the screen of their phones 71 times a day on average, that is approximately once every 15 minutes. A number of studies also provide evidence that there exists a strong relationship between the frequency of checking a smartphone and nomophobia (Akilli & Gezgin,2016; Kalaskar, 2015; Newport, 2015; Singh, Gupta & Garg, 2013; Pavithra & Madhukumar, 2015; Szpakow, Stryzhak, & Prokopowicz, 2011;Walsh et al., 2010). The ease of use and accessibility of diverse features that are available at any time in a mobile phone becomes a trap for some users who quickly develop dysfunctional habits, such as constantly checking mobile phone without specific goals (Oulasvirta et al., 2012), which grows rapidly into problematic use (Park, 2005).

Duration of Mobile Internet Ownership

In this study, a significant difference was established between the duration of owning a smartphone and nomophobia in adults. The findings show that the longer individuals have been using mobile internet, the higher the level of nomophobia is. In their work carried out with the participation of 475 secondary school students, Gezgin and Cakir (2016) report that students who have been using the Internet for more than 4 years have higher levels of nomophobia compared to those with lower durations of Internet usage. In their study shown that a relationship exists between internet addiction and nomophobia, Gezgin et al. (2017) also report a difference in favor of those who have been using the Internet for more than 4 years. They also show that a positive relationship exists between nomophobia and Internet addiction.

It is believed that the reasons behind the widespread use of smartphones are the opportunities they offer in exploring social network systems, online shopping, watching videos and/or TV, listening to radio, navigating the web and so on. The use of wireless systems together with these devices further fuels smartphone usage. Zhou, Lu and Wang (2010) argue that the reason for mobile internet becoming the center of the Internet is the widespread availability of wireless technologies. However, as the increase in the use of mobile internet offers convenience to users, it is known that this can increase dependency on smartphones (Shin, 2015). Furthermore, it is also known that mobile internet applications such as WhatsApp support addiction and overuse over smartphones causing predominant syndromes amongst adults (Choliz, 2012).

Duration of Daily Mobile Internet Use

Another finding of the work is the significant difference between daily use of the Internet by adults and nomophobia they suffer from. It is shown that the level of nomophobia is higher in adolescents surfing the Internet more. In his study, Kalaskar (2015) reports that students spend approximately 5-6 hours a day using their smartphones and that these students are prone to nomophobia related conditions (anxiety, fear, sleeplessness, stress, loss of interest in their studies etc.). In their study conducted on different age groups playing games on social media with 1151 participants Gezgin et al. (2017) report that individuals using the Internet more than 3 hours a day have higher levels of nomophobia compared to those using the Internet less. Furthermore, it is reported that applications such as social networks (Jeong et al., 2016; Salehan & Negahban, 2013) and games (Lapointe et al., 2013) exaggerates the use of the Internet.

Monthly GSM Mobile Internet Quota

Data analysis revealed no significant difference between adults' monthly Internet quota and level of nomophobia. This finding is unexpected. Reports show that amongst adults, those spending more time surfing the Interned show higher levels of nomophobia (Gezgin & Cakir, 2016). However, this may be related to the developments in wireless network technologies and their wide availability all around. The more Wi-Fi is used,

the less Internet quota is needed on smartphone contracts. In Deloitte's report on Global Mobile Users Survey, it is shown that in Turkey, while 82% of smartphone users prefer to access the Internet from home or office, 37% prefer to use their smartphones to surf the Internet at public places. When the users were asked what type of connection they preferred, 59% of the participants stated that they preferred Wi-Fi connection. This may well result in underusing Internet quota and hence, this may result in no significant difference between users' Internet quotas and level of nomophobia. It might be fair to say that the contracted Internet quota is not a true reflection of how much data they can transfer during surfing. For more accurate results, in addition to these descriptive studies, it is important to estimate is the volume of data (MB) actually transferred in a day through the use of mobile internet.

The Relationship between The Prevalence Of Nomophobia And Loneliness

The study shows a significant positive relationship between nomophobia and loneliness in adolescents. The findings show that individuals who lose access to their smartphones have a feeling of loneliness because of the fear of inability to socialize and communicate with others. When the relevant literature is examined some similar results can be seen. For example, in a study with 321 UG teenage students, carried out by Titilope (2014) a significant positive relationship is reported between mobile phone addiction and socio-psychological dimensions such as loneliness, boredom, egoism, and self-independence at varying significant levels. In addition, psychological and emotional states such as loneliness were found to correlate with smartphone addiction (Amichai-Hamburger, Wainapel, & Fox, 2002; Park & Lee, 2013). Park (2005) similarly carried out a study in Korea showing a positive relationship between mobile phones and loneliness amongst university students (Cit. Bian & Leung, 2014, p.3). Reid and Reid (2007) studied 158 adults who experienced social anxiety and loneliness. They found that lonely participants preferred making voice calls and rated texting as a less intimate method of contact to be used only as last resort, whilst anxious participants chose making fewer voice calls and preferred to text achieving expressive and intimate contact using this medium. Anxious participants also used texting as a diversion, to kill time or avoid some other activity. Cakir and Oguz (2017) found a positive and significant relationship between smartphone addiction and loneliness among adolescents just like that Tan, Pamuk and Donder (2013) found out a positive moderately relationship between mobile phone addiction and loneliness in their study. On the other hand, Sar (2013) stated that there is a positive relationship between problematic smartphone usage and loneliness, and negative relation between duration of mobile phone use and loneliness while Dayapoglu, Kavurmaci and Karaman (2013) found that a positive relationship between problematic mobile phone use and loneliness, and this relationship showed that loneliness increases with the increasing problematic mobile phone use in nurse candidates. As is seen above, the studies show that individuals heavily rely on smartphone use in socializing and they feel psychologically better when they have their smartphones. This situation explains the relationship between the feeling of loneliness and the fear of being away from smartphones.

Findings on the Simple Linear Regression Analysis between Nomophobia and Loneliness

The result of the study shows that the nomophobia level of adolescents is significantly and positively predicted by loneliness. According to this finding, considering the nomophobic behavior tendency among the adolescents, it is possible to say that adolescents who suffer from loneliness may have problems when they are separated from their smartphones. When the relevant literature is examined it can be seen that there is no study directly examining the prediction of loneliness on nomophobia, but there are some similar and different study results which evoke the relationship between nomophobia and loneliness. For example, Lee, Tam and Chie (2014) examined the association of personality factors, social anxiety (SA) and loneliness with mobile phone (MP) usage preferences on the basis of voice calling or text messaging, and found as the result of the multiple regression analyses that personality, SA and loneliness broadly predicted MP preferences. Hoffner, Lee and Park (2016) examined how mobile phones function as an affective technology for young adults, by adapting the self-expansion model to understand attachment to mobile phones. In their study, it was found that most respondents reported negative feelings, such as loneliness when without their mobile phone, and also the regression analysis revealed that the more respondents used their mobile phone for self-expansion, the more they expected to experience loneliness if without their phone. Toda and his colleagues (2008) state that university students use their mobile phones to get away from the feeling of loneliness when faced problems with their parents. In the study conducted by Park (2005) in Korea, it was also found that the level of loneliness of university students was positively predicted by smart phone addiction. The results of the thesis study conducted by Casey (2012) showed that smartphone addiction is mostly predicted by shyness and loneliness among the factors. In the study conducted by Dogan and Karakas (2016), multidimensional loneliness and the use of social

network sites were discussed, and it was seen that the loneliness in romantic and family relations predict significantly positive to the use of the social network sites while the loneliness in the social relations were not predict significantly to the use of social network sites. In addition, the study conducted by Aktas and Yılmaz (2017) among university students reported that loneliness predicts students' smartphone addiction significantly positive. On the other hand, the study conducted by Liu, Liu and Wei (2014) explored how cell phone use gratifications, cell phone use patterns, strong tie and weak tie mobile phone connections, and social network attributes are related to loneliness. However, the results of the study showed that some of the predictors were negatively related to loneliness which means the stronger the ties maintained via the mobile phone, the lower level of loneliness.

Within the light of these results while there is no evidence about the relations on nomophobia and smartphone addiction in the literature, it is thought that nomophobia may occur after the smartphone addiction, and may increase as the individual becomes alone. Because, individuals who feel loneliness can connect with other people via their smartphones, social network sites, and online games, and make friends, and talk with others on the platforms. In the context of this view, it is thought that individuals with the feelings of loneliness may be addicted to their smartphones while reaching to the platforms with their smartphones, and may get away the loneliness feeling. Finally, getting away from the feelings of loneliness with their smartphones may trigger their nomophobic behaviours.

Conclusion

No matter how difficult it might be to keep away from technology in this era of technological advancements, it should be kept in mind that technology might have a negative impact on peoples' lives, especially among adolescents. In parallel to the increasing use of smartphones, nomophobia is also increasing amongst adolescents. To prevent or minimize the negative impact of nomophobia, it is essential that teachers, families, and managers have an awareness of the problem and be equipped with knowledge to help the victims of it. It should be explained to adolescents that smartphones are important but cannot replace real relationships. In order to help adolescents, it is important for families and teachers to recognize the effects of smartphones on adolescents' lives, identify any addiction, and act accordingly. It may seem attractive for lonely people to establish relationships and socialize through the use of smartphones; however, it should be kept in mind that loneliness will keep increasing over time.

It is important to encourage adolescents to have new hobbies, participate in sports they like or play music, read, and participate in cultural activities watching a film, going to drama, to musicals and so forth so that individuals keep themselves away from smartphones, it helps them with socializing, overcome the fear of inability to use a smartphone, and walk away from the feeling of loneliness. It is fine to use smartphones in a controlled manner and conscientiously. It may seem difficult initially to go into a 'technological diet' and have a 'Technological detox'; however, in time, the individual concerned would be relaxed, and improve his/her social relationships. It may help to address problematic use of smartphones if teachers do not allow smartphones in classrooms, and avoid or limit the use of smartphones in mobile learning practices. The study carried out in this context shows that loneliness is an important psychological factor affecting nomophobia. Nevertheless, it is important that similar studies be carried out with different sample groups and age groups, and also addressed other dimensions of loneliness (e.g. social loneliness etc.).

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