European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.572344 Volume 3 | Issue 6 | 2017

# EXPLORING THE INFLUENCE OF THE PATTERNS OF MOBILE INTERNET USE ON UNIVERSITY STUDENTS' NOMOPHOBIA LEVELS

**Deniz Mertkan Gezgin**[i]
Trakya University,
Computer and Instructional Technology Department,
Edirne, Turkey

**Abstract:**
The purpose of this study is to examine the supposed effects of the duration of mobile Internet ownership, the duration of daily mobile Internet use, and monthly mobile Internet quota variables on the nomophobia levels of university students. The study group consists of 645 students, of whom 429 are female and 216 are male, and are studying within different departments and from different age groups. The Nomophobia Scale (NMP-Q) was used to determine the effect of variables on the nomophobia of the participant university students. One-way ANOVA, simple and multiple regression analysis techniques were used in the analyses of the data. Findings of the study showed no significant difference between the duration of smartphone ownership and the level of nomophobia among university students, whereas the level of nomophobia was higher among students who check their smartphone more frequently throughout the day. Furthermore, according to the results of multiple regression analysis, variables such as duration of mobile Internet ownership in terms of years, duration of daily mobile Internet use, and GSM mobile Internet quota are predictive of nomophobia prevalence in university students. Among these three variables, it is determined that the most predictive level of nomophobia is daily mobile Internet use.

**Keywords:** nomophobia, mobile internet, university student, mobile internet patterns

[i] Correspondence: email mertkan@trakya.edu.tr

## 1. Introduction

Today, smartphones have become an essential part of our techno-culture, especially among the Y and Z generation whose primary need is to socialise, join in and to perceive to be liked (Pavithra, Madhukumar, & Mahadeva, 2015). Similarly, Hong, Chiu, and Huang (2012) assert that mobile phones are popular among high school and university students because they increase their social communication and expand their opportunities for establishing social relationships. Smartphone usage also has become vital to students because they use them for several other purposes beyond that which normal Internet usage provides, with applications available that provide new functions for the user (Al-Barashdi, Bouazza, & Jabur, 2015). These functions allow users not only to communicate with others face-to-face or instantly, which is a perfect way for the more shy students to communicate with others, but also to enjoy different kinds of entertainment such as games. Users can also retrieve information while surfing the Internet, which can even be of help in order to remove themselves from uncomfortable situations. As a result, it seems that many students tend to rely heavily on their smartphones, which will inevitably lead to even heavier habitual usage (Casey, 2012).

The technological revolution has provided the world with many inventions. However, every invention has brought with it both advantages and problems; and the same can be said for smartphones (Ahmed, Ramzan, Qazi, & Jabeen, 2011). When the use of the Internet or smartphones becomes addictive, this can result in negative effects on financial, physical, psychological, and social aspects of life (Young, 1998). Although the Internet in general, and the mobile-accessed Internet on smartphones in particular have similar features making the type of addiction similar (Kwon et al., 2013), smartphones have unique factors to consider such as size (of the screen), applications, ubiquity, and flexibility in both time and space (Nielsen & Fjuk, 2010). The wide variety of available applications promotes the intensive use of smartphones and the subsequent need of being online (Okazaki & Hirose, 2009). There have been a number of studies that have focused on the addiction to smartphones and mobile phones (Bian & Leung, 2015; Chiu, 2014; Kwon et al., 2013), their problematic use (Takao, Takahashi, & Kitamura, 2009; Wang, Wang, Gaskin, & Wang, 2015), or their excessive use (Ha, Chin, Park, Ryu, & Yu, 2008; Lee et al., 2014). In addition, although there are few studies on 'nomophobia', which is caused by fear or loss for the individual in the absence of their mobile phone, it is considered the new phobia of the modern age and a tendency towards the significance of the subject area in research terms is increasing (King et al., 2013; Yildirim & Correia, 2015).

## 2. Literature review

### 2.1 Nomophobia (No Mobile Phone Phobia)

The concept of Nomophobia is a phobia of the current time, and is termed "no mobile phobia" or "no mobile phone phobia" and defined as fear of deprivation of a mobile phone. Individuals, especially young people, who are exposed to nomophobia express that they experience anxiety in not being able to communicate or access information when they forget to take their mobile phone with them, when the phone's battery charge is depleted, or when they are out of physical range for signal coverage. It is emphasised that as time progresses, this situation causes users to continually check their phones, even when the device is right next to them (Adnan & Gezgin, 2016; Algül, 2014; Dixit et al., 2010; Gezgin & Cakir, 2016; Pavithra et al., 2015; Sharma, Sharma, Sharma, & Wavare, 2015; Yildirim, Sumuer, Adnan, & Yildirim, 2016). Although not fully recognised by the field (Bragazzi & Del Puente, 2014), clinical psychology appears to define nomophobia as irrational and involuntary fear that an individual cannot access or cannot communicate on a mobile device (King et al., 2013; Yildirim & Correia, 2015). It is observed that anxiety symptoms such as fear, dizziness, difficulty in breathing, stomach cramps etc. have negative effects (Thomée, Härenstam & Hagberg, 2011) on the daily concentration of nomophobic individuals (Dixit et al., 2010). It is also possible to find studies that emphasise negative effects of nomophobia on young people's academic achievement (Erdem, Kalkin, Turen, & Deniz, 2016).

It can be seen from the studies conducted that nomophobia levels of individuals increase with the intensified use of smartphones (Dixit et al., 2010; Gezgin, Cakir, & Yildirim, 2016; Gezgin, Sahin, & Yildirim, 2017; Gupta, Garg, & Arora, 2016; Krajewska-Kułak et al., 2012; Lee, Chang, Lin, & Cheng, 2014; Park, 2005; Pavithra et al., 2015; Pellowe, Cooper, & Mattingly, 2015; Singh, Gupta, & Garg, 2013; Szpakow, Stryzhak, & Prokopowicz, 2011; Yildirim et al., 2016). In the literature, it is recognised how common and widespread nomophobia currently is with findings revealed by studies conducted in various countries and across different cultures (Chóliz, 2010; King et al., 2013; Oksman & Turtiainen, 2004; Tavolacci, Meyrignac, Richard, Dechelotte, & Ladner, 2015). Studies based on different sampling sizes and studies in different countries reveal that nomophobia increases at a rate that cannot be ignored, especially among the younger generation (Cheever, Rosen, Carrier, & Chavez, 2014; Dixit et al., 2010; Kaur & Sharma, 2015; King et al., 2013; Oksman & Turtiainen, 2004; Pavithra, et al., 2015; Sharma et al., 2015; Tavolacci et al., 2015). Furthermore, when the studies on nomophobia are examined, it can be determined that almost half of university students (Erdem et al., 2016; Yildirim et al., 2016) display nomophobic behaviours above that of a

moderate level (Adnan & Gezgin, 2016; Akilli & Gezgin, 2016; Gezgin et al., 2017; Uysal, Özen, & Madenoğlu, 2016). Considering the studies performed both in Turkey and worldwide, some relations have been noted between nomophobia and the demographic characteristics of individuals and their smartphone usage behaviours. Studies have shown that the duration of mobile Internet ownership is more influential on nomophobia than the period of having a smartphone (Gezgin & Cakir, 2016; Gezgin et al., 2017). Therefore, it is thought that the relationship between mobile Internet and symptoms such as fear, anxiety and stress due to nomophobia is considered important in the case of absence of a user's smartphone (as the use of non-smart class mobile phones are almost no longer used widespread by the younger generation).

## 3. Smartphone Use, Nomophobia and Internet

When the usage of smartphones among young people is examined, social networks, communication, games, video, music and streaming are the most prolific (Anshari et al., 2016; Gezgin & Cakir, 2016). It is stated that young people are more likely to use social media and online messaging programs in order to stay in touch with their family and friends (Anshari et al., 2016). This situation has led especially to the rapidly increasing popularity of social networking services and the corresponding increase in the number of young users. In addition to web access, social network services are thought to have been effective in increasing the widespread use of SNS mobile applications (Salehan & Negahban, 2013) in their provision of easier and faster access. It is also an indisputably popular and widespread activity for younger individuals to acquire access to the Internet using a smartphone. It is emphasised that the popularity of this activity can be caused by excessive Internet use (Lin & Tsai, 2002). Extreme use of the Internet is prevalent due to the widespread preference for smartphones and their accessibility at any time of the day or night. One of the most important features of smartphones is that they should be connected 24x7 to the Internet for various purposes such as accessing information through a wide variety of mobile applications (Okazaki & Hirose, 2009) or mini-browsers, connecting to social networks, or for downloading music or videos. In a study conducted by Anshari et al. (2016), it was reported that the older generation use the Internet for less than 6 hours a day, but the younger generation tends to be connected to the Internet almost 24x7.

Excessive and problematic use of mobile Internet is associated with excessive dependence on mobile phones, especially among young people. This mobile phone dependency situation can lead to Internet dependency or problematic Internet usage, as well as possible smartphone dependency (Kwon et al., 2013). In addition to mobile

Internet, features such as the ability of smartphones to be in the hands of individuals at all times, the ability to use a wide variety of mobile applications, and the triggering of excessive usage of smartphones all contribute to smartphone dependency (Oulasvirta, Rattenbury, Ma, & Raita, 2012; van Deursen, Bolle, Hegner, & Kommers, 2015). According to scale instruments developed for smartphone dependency, smartphone dependency has similar characteristics to Internet dependency as seen by the presence of items that also measure Internet dependency (Kwon et al., 2013). It has been determined that problematic Internet usage and problematic mobile phone usage, albeit possibly less so, can result in the psychological disturbance of users (Beranuy, Oberst, Carbonell, & Chamarro, 2009). This inevitable linking of the Internet and smartphones is thought to be related to the psychological symptoms of anxiety and the fear of anxiety (Anshari et al., 2016), which is known as nomophobia and caused by the dependence on smartphones and the use of mobile Internet. Park, Hyun, and Ha (2014), in a study investigating the differences between 1,420 adolescents' Internet and mobile phone addiction in South Korea, reported that the factors that cause Internet and mobile phone dependencies are similar and related. Similarly, Choi et al. (2015) studied the risks of smartphone dependency with the participation of South Korean university students and determined that high-level smartphone dependence was positively associated with Internet addiction. In Israel, a study by Ben-Yehuda, Greenberg, and Weinstein (2016) consisted of 40 participants at a university, which also demonstrated a positive correlation between Smartphone use and Internet addiction. In a study conducted in Saudi Arabia, it was reported that one of the most important predictors of smartphone dependency is the excessive use of smartphones that provide ease of access to over-the-Internet and mobile Internet applications (Aljomaa, Qudah, Albursan, Bakhiet, & Abduljabbar, 2016). In Turkey, Gezgin, Cakir, and Yildirim (2016) conducted a study with the participation of 929 high school students and showed a moderately positive relationship between nomophobia prevalence and Internet addiction among the adolescent participants. Similarly, Gezgin and Cakir (2016) reported that adolescents who spend more time on the Internet each day have a higher level of nomophobia than those who spend less. Gezgin et al. (2017) studied 1,151 social network users and reported that individuals whose duration of mobile Internet ownership or daily mobile Internet use is longer display higher levels of nomophobic behaviours.

These studies have shown that the excessive use of mobile Internet and mobile Internet applications creates problems. It is also thought that such problematic and excessive use of mobile Internet is important in relation to the formation of nomophobia, which is considered as a new problem for mobile phone users. Within this

context, this current study aims to reveal the relationship between nomophobia and mobile Internet, and how individuals' mobile Internet usage patterns can predict the presence of nomophobic behaviours. Therefore, this study considers the fundamental questions of "Do the variables of mobile Internet ownership, daily mobile Internet use, and mobile Internet quota significantly predict the prevalence of nomophobia among university students?", and led to the forming of the following research questions addressed in this study.

1. What are the purposes of university students using mobile Internet via smartphones?
2. Is there a meaningful difference between the duration of university students' smartphone ownership and their level of nomophobia?
3. How much do the duration of mobile Internet ownership, daily mobile Internet use, and mobile Internet quota variables separately predict levels of nomophobia?
4. How much do the duration of mobile Internet ownership, daily mobile Internet use, and mobile Internet quota variables collectively predict levels of nomophobic behaviour?
5. What are the strengths of these variables in determining the nomophobia level of university students?

## 4. Methodology

This is a relational survey study which aims to explore the relation between the patterns of mobile Internet use and the prevalence of nomophobia among university students. In survey studies, the researchers do not manipulate the context or apply any intervention to the context, but rather they define the existing condition (Fraenkel & Wallen, 2006).

### 4.1 Sampling

A total of 645 university students were randomly selected to participate in the study from various faculties at 28 Turkish state universities (Adnan Menderes, Akdeniz, Ankara, Anadolu, Atatürk, Bahçeşehir, Celal Bayar, 18 Mart, Dumlupınar, Gazi, Hacettepe, İstanbul, İzmir Ekonomi, Kırklareli, Kocaeli, Marmara, Hacı Bektaş Veli, Pamukkale, Trakya, Uşak, Uludağ, Dokuz Eylül, Bilkent, Ege, Karadeniz Teknik, Hacettepe, and Middle East Technical University) during the 2015-2016 spring semester. Participants were aged between 18 and 35 years, with 429 (66.5%) females and 216 (33.5%) males. Of the participants, 92 (14.3%) were in their first grade, 85 (13.2%) in

their second grade, 86 (13.3%) were third grade, and 382 (59.2%) were studying in their fourth grade.

**Table 1:** Participant Demographic Information

| **Gender** | **N** | **%** |
|---|---|---|
| Female | 429 | 66.5 |
| Male | 216 | 33.5 |
| **Grade Level** | | |
| 1st Grade | 92 | 14.3 |
| 2nd Grade | 85 | 13.2 |
| 3rd Grade | 86 | 13.3 |
| 4th Grade | 382 | 59.2 |
| **Duration of Smartphone Ownership** | | |
| Less than 1 year | 35 | 5.4 |
| 1-2 years | 131 | 20.3 |
| 3-4 years | 224 | 34.7 |
| More than 4 years | 255 | 39.5 |
| **Smartphone Checked for Mobile Internet Applications (daily)** | | |
| 1-16 times | 99 | 15,3 |
| 17-32 times | 183 | 28,4 |
| 33-48 times | 133 | 20,6 |
| More than 49 times | 230 | 35,7 |
| **Duration of Mobile Internet Ownership** | | |
| Less than 1 years | 33 | 5,2 |
| 1-2 years | 184 | 28,5 |
| 3-4 years | 226 | 35,0 |
| More than 4 years | 202 | 31,3 |
| **Duration of Daily Mobile Internet Use** | | |
| Less than 1 hours | 59 | 9,1 |
| 1-2 hours | 179 | 27,8 |
| 3-4 hours | 165 | 25,6 |
| More than 4 hours | 242 | 37,5 |
| **Mobile Internet Quota Ownership (monthly)** | | |
| 1 GB | 92 | 14,3 |
| 2 GB | 299 | 46,4 |
| 3 GB | 77 | 11,9 |
| 4 GB | 82 | 12,7 |
| More than 4 GB | 95 | 14,7 |
| **Total** | 645 | 100 |

## 4.2 Instrumentation

A demographics information form and nomophobia scale were used in this study.

The Nomophobia Scale (NMP-Q), which was developed by Yildirim and Correia (2015) and adapted into Turkish by Yildirim et al. (2016), was used in this study. The scale consists of 20 Likert-type items ranging from 1 (strongly disagree) to 7 (strongly agree). The scale has four sub-dimensions; Not Being Able to Access Information (four items), Losing Connectedness (five items), Not Being Able to Communicate (six items), and Giving up Convenience (five items). The reliability coefficient of the original scale was calculated as .95 by using Cronbach's Alpha and the reliability coefficient of the Turkish adaptation was found to be .92. In the original scale, the reliability coefficients of the sub-dimensions were reported as .94, .87, .83, and .81, respectively; whilst in the Turkish version they were reported as .90, .74, .94, and .91 (same order of sub-dimensions). A value in excess of .80 indicates that a scale has a high reliability (Field, 2005).

The demographic information form captures information about gender, age, university, class level, duration of smartphone ownership, duration of smartphone checking time, duration of mobile Internet ownership, duration of daily mobile Internet use, mobile Internet quota, and the aims for using them. The study's data collection process administered based on voluntary participation of the university students via a Google survey developed by the researchers.

### 4.3 Data Analysis

Analysis of the data was performed using SPSS 23.0 computer software (Statistical Package for Social Sciences). Kolmogorov-Smirnov test confirmed that normal distribution values were smaller than the level of statistical significance ($p<.05$); therefore, the values of Skewness and Kurtosis were used to measure normal distribution. In cases with a high number of participants in a study group, having Skewness and Kurtosis values of ± 1.96 generates normality hypothesis (Tabachnick & Fidell, 2007). The findings represented normality hypothesis and problems of extensive Kurtosis and Skewness were not found to exist. The statistical significance level was taken as .05 in the statistical analysis.

## 5. Findings

In this section, the data obtained from the nomophobia scale have been analysed and presented in terms of the purpose and sub-problems of the study. When the demographic characteristics of the students participating in the research are examined, all participants are shown to have smartphones and mobile Internet.

### 5.1 Findings: Nomophobia Scale

The mean of the Nomophobia Scale was calculated ($\bar{X}$=79.71) and the nomophobia levels of the university students were found to be at a moderate level. While examining the subscale means, not being able to access information ($\bar{X}$=17.75), losing connectedness ($\bar{X}$=19.89), and not being able to communicate ($\bar{X}$=26.87) were found to have a higher than average mean score. However, only giving up convenience ($\bar{X}$=15.20) was found to be lower than the average mean score. In terms of the university students, it was seen that the situations of not being able to communicate, not being able to reach information and losing connectedness were the most important, respectively. In the study, descriptive statistical data for the scores of the participants on the nomophobia scale were calculated and are presented in Table 2.

**Table 2:** Descriptive Statistics of the Participants Scored by Nomophobia Scale

| Scale | Sub-Dimensions | N | $\bar{X}$ | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Nomophobia | **Not being able to reach to information** | 645 | 17,75 | 6,44 | -,219 | -,521 |
| | **Losing connectedness** | 645 | 19,89 | 7,66 | ,060 | -,748 |
| | **Not being able to communicate** | 645 | 26,87 | 9,87 | -,262 | -,769 |
| | **Giving up convenience** | 645 | 15,20 | 8,15 | ,634 | -,799 |
| | **Scale Total Score** | 645 | 79.71 | 26,65 | ,154 | -,546 |

### 5.2 University Students' Purposes of Mobile Internet Use

The frequency and percentage values of the answers given by the university students in the research group to the mobile Internet use purposes on the smartphone were calculated and the results are presented in Table 3.

**Table 3:** University Students' Purposes to Use Mobile Internet on Smartphone

| | Yes | | No | |
|---|---|---|---|---|
| | N | % | N | % |
| Social Network Services (SNS) | 601 | 93.2 | 44 | 6.8 |
| Communication | 571 | 88.5 | 74 | 11.5 |
| Research | 508 | 78.8 | 137 | 21.2 |
| Education | 501 | 77.7 | 144 | 22.3 |
| News | 464 | 71.9 | 181 | 28.1 |
| Photography | 457 | 70.9 | 188 | 29.1 |
| Music | 454 | 70.4 | 191 | 29.6 |
| Video | 437 | 67.8 | 208 | 32.2 |
| Navigation | 350 | 54.3 | 295 | 45.7 |
| Banking | 299 | 46.4 | 346 | 53.6 |
| Game | 276 | 42.8 | 369 | 57.2 |
| Shopping | 273 | 42.3 | 372 | 57.7 |

| | | | | |
|---|---|---|---|---|
| E-book | 182 | 28.2 | 463 | 71.8 |
| Booking(Holiday planning) | 122 | 18.9 | 523 | 81.1 |

When Table 3 is examined, it can be seen that the first two purposes for university students using mobile Internet on smartphones are SNS (93.2%) and Communication (88.5%). The following purposes are homework and lesson research (78.8%), education applications (77.7%) (m-learning, in-class activities etc.), and news (71.9%) respectively. Purposes of use such as entertainment photography (70.9%), music (70.4%), and video (67.8%) are the next most popular.

### 5.3 Duration of Smartphone Ownership

One-way ANOVA test was employed to discover whether or not the nomophobia levels of university students differed in terms of their duration of smartphone ownership. According to the results of the analysis, a significant difference was not found between the nomophobia levels of university students in terms of duration of smartphone use [F (3, 641) =2.122, p=.09].

**Table 4:** One-way ANOVA Analysis -Duration of Smartphone Ownership

| Source | Sum of Squares | Df | Mean Squares | F | p |
|---|---|---|---|---|---|
| Intergroups | 4495.446 | 3 | 1498.482 | | |
| Within Groups | 452756.585 | 641 | 706.329 | 2.122 | .09 |
| Total | 457252.031 | 644 | | | |

### 5.4 Number of Smartphone Checks per Day

One-way ANOVA was employed to discover whether or not the nomophobia levels of university students differed in terms of the number of smartphone checks performed per day. According to the results of the analysis, a significant difference was found between the nomophobia levels of university students in terms of the number of smartphone checks performed per day [F (3, 641) =46.443, p=.00]. As a follow-up, Tukey Test was performed in order to understand which groups differed from each other. According to the results of the Tukey test, it was determined that the nomophobia levels of the groups which checked their smartphones 33-48 times per day (M = 84.77, SS = 25.39) and 49 times and over (M = 91.85, SS = 24.47) were higher than the groups which checked them fewer times. As a result, it can be said that nomophobia is high in individuals who check their smartphones more frequently per day.

**Table 5:** One-way Variance Analysis -Number of Smartphone Checks per Day

| Source | Sum of Squares | Df | Mean Squares | F | p |
|---|---|---|---|---|---|
| Intergroups | 81643.082 | 3 | 27214.361 | | |
| Within Groups | 375608.949 | 641 | 585.973 | 46.443 | .00* |
| Total | 457252.031 | 644 | | | |

*p<.05

### 5.5 Simple Linear Regression Analysis Relation to Findings

Considering one of the problems pertaining to this research, "How much do the duration of mobile Internet ownership, daily mobile Internet use, and mobile Internet quota variables separately predict levels of nomophobia?", simple regression analysis was conducted as a means to measure the relationship between mobile Internet use patterns and nomophobia levels of university students. Findings of this analysis are presented in Table 6.

**Table 6:** Simple Linear Regression Analysis

| Model | B | Standard Error | Beta | t | p |
|---|---|---|---|---|---|
| **Constant** | 72.264 | 2.406 | | 30.033 | .00 |
| **Mobile Internet Quota** | 2.784 | .812 | .134 | 3.430 | .00 |
| **R**=.134 **R²**=.018 **Adjusted R²**=.016 **F**(1-643)= 11.763 | | | | | |
| **Constant** | 59.915 | 3.503 | | 17.106 | .00 |
| **Duration of mobile internet ownership** | 6.765 | 1.145 | .227 | 5.908 | .00 |
| **R**=.227 **R²**=.051 **Adjusted R²**=.050 **F**(1-643)= 34.899 | | | | | |
| **Constant** | 41.605 | 2.800 | | 14.861 | .00 |
| **Daily use of mobile internet** | 13.072 | .908 | .494 | 14.396 | .00 |
| **R**=.494 **R²**=.244 **Adjusted R²**=.243 **F**(1-643)= 207.259 | | | | | |

As a result of simple linear regression analysis of monthly mobile Internet quota, it was found to have a low level meaningful relationship with nomophobia (R=.134, $R^2$=.018, p<.01), and explains 2% of the total variance at the nomophobia level. When the standardised (β) coefficient and t values are examined, it can be said that mobile Internet quota is a significant predictor of nomophobia. In the simple linear regression analysis for duration of mobile Internet ownership, it was found to have a low level and meaningful relationship with nomophobia (R=.227, $R^2$=.051, p<.01), and explains 5% of the total variance at the nomophobia level. When the standardised (β) coefficient and t values are examined, it can be said that duration of mobile Internet ownership is a significant predictor of nomophobia. Finally, it was found that the duration of daily mobile Internet use has a moderate level and meaningful relationship with nomophobia

(R=.494, $R^2$=.244, p<.01), and explains 24% of the total variance at the nomophobia level. When the standardised (β) coefficient and t values are examined, it can be said that duration of daily mobile Internet use is a significant predictor of nomophobia.

### 5.6 Multiple Regression Analysis Relation to Findings

Multiple regression analysis was performed in order to determine the nomophobic level of university students' mobile Internet usage patterns and the results are presented in Table 7.

**Table 7:** Multiple Regression Analysis

| Variable | B | Standard Error | β | t | p | Part r | Partial r |
|---|---|---|---|---|---|---|---|
| **Constant** | 34.393 | 3.747 | | 9.180 | .00 | | |
| **Mobile Internet Ownership Duration** | 2.912 | 1.092 | .098 | 2.668 | .01 | .105 | .091 |
| **Daily Mobile Internet Use Duration** | 12.293 | .945 | .464 | 13.015 | .00 | .457 | .444 |
| **Mobile Internet Quota** | .360 | .746 | .017 | .482 | .63 | .019 | .016 |

**R=**.504; **$R^2$=**.254 Adjusted;**$R^2$=**.250; $F_{(3\text{-}641)}$ = 72.644; **P=**.000

The duration of daily mobile Internet use, the duration of mobile Internet ownership and the mobile Internet quota variables collectively present a moderate level meaningful relationship with the nomophobia levels of the participants (R=504, $R^2$=254, p<.01). These three variables together account for 25% ($R^2$) of the total variance in the nomophobia. According to the standardized regression coefficient (β), relative importance order of nominal variables over nomophobia are; the duration of mobile Internet use, the duration of mobile Internet ownership, and the mobile Internet quota. When the results of the t test on the significance of the regression coefficients are examined, it is seen that the duration of daily mobile Internet use and duration of mobile Internet ownership are significant predictors of nomophobia. According to the results of the regression analysis, the regression equation mathematical model for the nomophobia prediction is given as follows:

Nomophobia = 34.393+2.912 * Mobile Internet Ownership Duration + 12.293 * Daily Mobile Internet Use Duration + .360 * Mobile Internet Quota.

The increase in these mobile Internet patterns according to this model increases the nomophobia at the same rate.

## 6. Discussion

This current study reveals the effect of mobile Internet use patterns on nomophobia. In this section, findings of the study are discussed in the order of the research questions.

The first finding of the study indicates that the nomophobia level of the participant university students is moderate. In addition, it is seen that the sub-factors of not being able to communicate, not being able to reach information, and losing connectedness are important for university students in terms of the order of importance. These findings are as expected, since it is observed that quantitative studies in Turkey using the same Nomophobia scale support this finding, and that among the nominal level of nomophobia among the participant university students, and situations of "not being able to reach information" and "not being able to communicate" are considered important by the students (Adnan & Gezgin, 2016; Akilli & Gezgin, 2016; Erdem et al., 2016; Gezgin et al., 2017; Uysal et al., 2016; Yildirim et al., 2016). In addition to these results, it has been reported that nomophobia is spreading wider among university students in studies conducted with different measurement tools in a number of countries (Dixit et al., 2010; Pavithra et al., 2015; Yildirim & Correia, 2015).

### 6.1 Duration of Smartphone Ownership

There was no significant difference found between university students' duration of smartphone ownership and their nomophobia level in this study, which is parallel to the results of study on nomophobia-related university students in Turkey (Adnan & Gezgin, 2016). It was also reported that there was no difference found between the duration of smartphone ownership and the level of nomophobia in a study conducted with 1,151 participants of different age groups who played games on social networks (Gezgin et al., 2017). Contrary to this finding, a study conducted on university students by Gezgin et al. (2017) stated that the level of nomophobia was found to be higher between individuals who have used a smartphone for less than one year and those who have uses one for more than four years, in favour of more than four years. In addition to this finding, there are studies that indicate that the nomophobia level increases as the duration of smartphone ownership increases (Yildirim & Correia, 2015; Yildirim et al., 2016). The result found by this study was not an expected result; however, it should be noted that all participants are Y generation and that their ages are close to each other, whereas studies with different age groups may provide more effective results.

In particular, it is thought that comparative studies between generations are important for evaluating both the duration of smartphone ownership and the level of

nomophobia. This is pertinent because it is known that features such as mobile Internet, mobile applications (SNS, games, video, music, etc.) are popular with the Y generation, as are the functions of smartphones and mobile phones (search, messaging etc.) (Wang et al., 2015). In this respect, it is important to know whether or not the duration of smartphone ownership or the ability of smartphone use and/or mobile application skills' and attitudes' effects levels of nomophobia for different age groups or across generations.

**6.2 Smartphone Checking per Day**

A significant difference was found in this study between the amount of smartphone checking in a day by university students and their nomophobia levels. It was seen that those who check their phones every 15 minutes or more frequently during the day, display a higher level of nomophobia than those who check their phones less frequently. As a result of this finding, it can be said that students who check their smartphones more frequently during the day show more nomophobic behaviours than those who check it less. In support of this, a study by an international consultancy company, the Deloitte's Global Mobile Users Survey report, surveyed mobile phone users aged 18-50 in Turkey, and indicated that participants looked at their mobile phone screen on average 71 times per day, or approximately every 15 minutes that they are awake. Many studies have reported that the behaviour of frequently checking of a smartphone is related to nomophobia (Akilli & Gezgin, 2016; Gezgin et al., 2017; Kalaskar, 2015; Newport, 2015; Pavithra et al., 2015; Singh et al., 2013; Szpakow et al., 2011; Walsh, White, & Young, 2008). A study by Pavithra et al. (2015) which examines mobile phone dependency states that the behaviour and habit of checking a mobile phone screen is one of the characteristic features of mobile phone dependency and nomophobia. The ease of accessibility to diverse features and the ease of use of smartphones at any point in time causes various features to turn into risks for individuals, who rapidly turn dysfunctional habits into behaviour such as constantly checking the phone screen without a specific purpose in mind (Oulasvirta et al., 2012), and quickly engaging in problematic use (Park, 2005). However, it is necessary to think about the purpose that mobile phones are being checked for, because nomophobia is defined as fear and anxiety occurring from mobile phone deprivation. It is therefore important to know whether the university students are checking their phones simply to check the charge status or the signal strength, or whether they are checking for messages and missed calls from friends or family on social networks. From this point of view, it is important to determine for what purpose university students frequently check their smartphones for by conducting qualitative studies. In addition, there are

also studies which show that young people often check their smartphones to control their social network accounts, which in turn leads to problematic social network usage because of the fear of missing out, known as FoMo (Elhai, Levine, Dvorak, & Hall, 2016; Hetz, Dawson, & Cullen, 2015; Przybylski, Murayama, DeHaan, & Gladwell, 2013; Spitzer, 2015). Thus, it should be determined whether the university students' behaviour of frequently checking their smartphone screen is due to nomophobia, FoMo, or a different predictor altogether. Finally, further research should be conducted in order to clarify a possible relationship between FoMo and Nomophobia.

**6.3 Mobile Internet Usage Patterns**

When findings in terms of mobile Internet usage patterns' impact on nomophobia are examined, the separate simple linear regression variables of duration of mobile Internet ownership, duration of daily mobile Internet use, and mobile Internet quota were found to be predictors of nomophobia. According to the findings, it can be stated that there is a moderate level correlation between nomophobia and mobile Internet use patterns (r.504, p <.00) and 25% of variance on nomophobia can be explained by these patterns. This result, nevertheless, does not change the conclusion that the variables describing mobile Internet use are meaningful predictors of nomophobia. It was also found in the study on adolescents by Škařupová, Ólafsson, and Blinka (2016), which supports the findings of the current study, that excessive smartphone usage is highly associated with problematic Internet use (r = .620, p <.00). In addition, in the study conducted by Beranuy et al. (2009), it was expressed that students who showed negative consequences of Internet use, will probably do the same with a mobile phone, so these factors collectively formulate increased psychological distress.

When it is considered that social networks and communication are the leading purposes of university students' mobile Internet usage, the widespread ownership of smartphones and ease of access, and the offering of various applications are also important in terms of showing nomophobic behaviours. Therefore, smartphones that provide access to information and personal intercommunication from any point without the need for laptops or PCs, cannot be considered independently from the mobile Internet. In particular, the overuse of mobile communication applications which operate via the Internet such as WhatsApp, HikeMesenger, Viber, and Facebook Messenger (Singh & Yadav, 2015), social networking applications (Salehan & Negahban, 2013) and mobile game applications (Lapointe, Boudreau-Pinsonneault, & Vaghefi, 2013) are causing excessive mobile Internet and smartphone usage. The use of mobile Internet and its communication applications such as WhatsApp may increase mobile phone dependence as well as abuse. This especially concerns teenagers since

their dependence on mobile phones is a problem on the rise (Chóliz, 2012). In a comparative study conducted by Shin (2014), it was revealed that young people have a tendency for mobile Internet dependence. Accordingly, daily mobile Internet usage seems to be the most important predictor for this phenomenon. In studies conducted on differing samplings that support this finding, it is stated that young people who use mobile Internet more frequently on a daily basis show more nomophobic behaviours (Gezgin, Çakır, & Yıldırım, 2016; Gezgin et al., 2017; Škařupová et al., 2016).

The duration of mobile Internet ownership meaningfully predicts nomophobia level although it is at a low level. It can be argued that individuals who have a longer duration of mobile Internet ownership tend to exhibit nomophobic behaviours. Individuals whose most important mobile Internet usage purposes are social networking and communication, spend more time with their smartphones. It is therefore quite natural to comment that individuals establish a relation with their smartphone. Similarly, in a study of 1,151 social network users by Gezgin, Sahin, and Yildirim (2017), the groups using mobile Internet for 3-4 years and more than five years were found to have higher nomophobia levels than the groups using mobile Internet for less than one year.

Monthly quota for mobile Internet access is also seen as a predictor of nomophobia, although at a low level. Individuals with larger mobile Internet access quotas showing increased levels of nomophobic behaviour may even raise their quotas since they find it insufficient for their needs. This should not be overlooked as being associated with duration of daily mobile Internet use. In the multiple regression analysis of the three variables' power on nomophobia, it is seen that the three variables collectively predict nomophobia. However, it is also seen that the mobile Internet quota variable does not significantly predict nomophobia. With the development and widespread availability of wireless networks, young people are able to connect to the Internet via Wi-Fi connections at school, at home, at Internet cafés, or within public hotspot broadcast catchment areas. Due to these mobile Internet usage behaviours that are in additional to GSM packages, the quota variable in this study may not have predicted nomophobia. It is thought that more effective results could be obtained in future studies conducted on the basis of the monthly amount of Internet quota (GB), since while individuals might have a GSM quota of one GB per month, they might also use up to (but not limited to) one GB of data per day connected to wireless (non-GSM) networks.

## 7. Conclusion

It is an undeniable fact that technology has helped make people's lives easier in almost every field, as technology continues to develop rapidly in the modern era. This is especially applicable to the younger generation who are actively involved in the use of technology. Smartphones, which are most widely used by the younger generation, seem to be with them at all times, wherever they may be, and used to host Internet access as their portal to the world. This situation of increased connection between phone and student seems to be on the rise day by day. However, the widespread use of smartphones has also brought about some drawbacks, and one of them is nomophobia. Unfortunately, this current study shows that the prevalence of nomophobia among university students is increasing. It is also seen that of nomophobia's symptoms, the increase of fear and anxiety are not only related to the smartphone, but also to mobile Internet connectivity that smartphones often use. In particular, as revealed in this study, it has been seen that the increase in time spent on smartphones and mobile Internet is one of the important predictors of nomophobia. The strongest among the reasons for this is the hosting of mobile SNS applications on smartphones. In line with this information, avoiding excessive and problematic usage of mobile Internet and especially SNS mobile applications is considered important in order to prevent the development of nomophobia and the resultant problems associated with nomophobia. Students should therefore take steps to avoid problematic and excessive smartphone use such as being directed towards alternative activities like reading books, participating in sports, establishing real social relations and improving their life satisfaction. In addition, measures can be taken with the application of rules such as smartphones not being permitted in the classroom. As a result, life satisfaction, academic motivation, academic achievement and lecture concentration may be improved that currently negatively affect the academic life of students.

At this point, it would be wrong to adopt the idea of trying to ban technology usage or from keeping young people away from technology. Technology should in fact very much to be used among young people, not only as consumers but also as producers, and for this, it is necessary for them to consciously use technology. In this respect, there are important responsibilities and duties for teachers, academics, and family members alike. Family members should not forget that their children will often take their parents as a role model and should therefore spend more time with their children face to face. They also should take important steps in order to prevent their children from becoming technology addicts at a young age.

Academics should also take great care when using smartphones in m-learning applications as students can navigate away from m-learning applications and use mobile applications instead such as other SNS. It is thought that some technology usage rules should be enforced in the classroom, and finally, it should not be forgotten that there is a real world out there; that there is life other than virtual reality. Real-time social relations, sportive activities, listening to peaceful music, and reading a beautiful book should be regarded as valuable for students in terms of their spiritual wellbeing.

In future studies, it is suggested to focus upon which mobile applications are predictive of smartphone dependency or nomophobia via mobile Internet and smartphones, especially SNS applications, and it is suggested to select the sample from different age groups.

### 7.1 Limitations

The results of this study should be interpreted in the context of the study's limitations. First, the sample was small, and thus cannot represent a generalised university student population. Further research should therefore include adolescents. Second, the gender ratio in this current study was deemed inappropriate. The number of females (429) was twice that of males (216), and a gender difference error or limitation may therefore exist as a result. Thus, a well-designed research considering gender is necessary. Third, the literature for this field is not yet adequately rich as nomophobia is still a new field of academic research. Fourth, mobile Internet quota only represented user's GSM monthly quota in this study, whereas future research should consider the total mobile Internet usage (GSM and non-GSM) as a predictor for nomophobia.

## References

1. Adnan, M., & Gezgin, D. M. (2016). A Modern Phobia: Prevalence of Nomophobia among College Students [Modern Çağın Yeni Fobisi: Üniversite Öğrencileri Arasında Nomofobi Prevalansı]. *Ankara University Journal of Faculty of Educational Sciences*, 49(1), 141-158.
2. Ahmed, I., Ramzan, M., Qazi, T. F., & Jabeen, S. (2011). An investigation of mobile phone consumption patterns among students and professionals; is there any difference? *European Journal of Economics, Finance & Administrative Sciences*, 39, 136-143.

3. Akilli, G. K., & Gezgin, D. M. (2016). Examination of the Relationship between Nomophobia Levels and Different Behavior Patterns of University Students [Üniversite Öğrencilerinin Nomofobi Düzeyleri ile Farklı Davranış Örüntülerinin Arasındaki İlişkilerin İncelenmesi]. *Mehmet Akif Ersoy University Journal of Education Faculty*, 1(40).
4. Al-Barashdi, H. S., Bouazza, A., & Jabur, N. H. (2015). Smartphone addiction among university undergraduates: a literature review. *Journal of Scientific Research & Reports*, 4(3), 210-225.
5. Algül, R. (2014). *Acı Badem University. The Disease of Technology Era [Acı Badem Üniversitesi. Teknoloji Çağının Hastalığı: Nomofobi].* Retrieved from http://www.acibadem.com.tr/Hayat/Bilgi/teknoloji-caginin-hastaligi-nomofobi on January 21, 2017.
6. Aljomaa, S. S., Qudah, M. F. A., Albursan, I. S., Bakhiet, S. F., & Abduljabbar, A. S. (2016). Smartphone addiction among university students in the light of some variables. *Computers in Human Behavior*, 61, 155-164.
7. Anshari, M., Alas, Y., Hardaker, G., Jaidin, J. H., Smith, M., & Ahad, A. D. (2016). Smartphone habit and behavior in Brunei: Personalization, gender, and generation gap. *Computers in Human Behavior*, 64, 719-727.
8. Ben-Yehuda, L., Greenberg, L., & Weinstein, A. (2016). Internet Addiction by Using the Smartphone-Relationships between Internet Addiction, Frequency of Smartphone Use and the State of Mind of Male and Female Students. *Journal of Reward Deficiency Syndrome & Addiction Science*, 2(1), 22-27.
9. Beranuy, M., Oberst, U., Carbonell, X., & Chamarro, A. (2009). Problematic Internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computers in Human Behavior*, 25(5), 1182-1187.
10. Bian, M., & Leung, L. (2015). Linking loneliness, shyness, smartphone addiction symptoms, and patterns of smartphone use to social capital. *Social Science Computer Review*, 33(1), 61-79.
11. Bragazzi, N. L., & Del Puente, G. (2014). A proposal for including nomophobia in the new DSM-V. *Psychology Research & Behavior Management*, 7, 155.
12. Casey, B. M. (2012). *Linking psychological attributes to smartphone addiction, face-to-face communication, present absence and social capital* (Unpublished Master's thesis). The Chinese University of Hong Kong, Hong Kong, China.
13. Cheever, N. A., Rosen, L. D., Carrier, L. M., & Chavez, A. (2014). Out of sight is not out of mind: The impact of restricting wireless mobile device use on anxiety levels among low, moderate and high users. *Computers in Human Behavior*, 37, 290-297.

14. Chiu, S. I. (2014). The relationship between life stress and smartphone addiction on Taiwanese university student: A mediation model of learning self-efficacy and social self-efficacy. *Computers in Human Behavior*, 34, 49-57.
15. Choi, S.-W., Kim, D.-J., Choi, J.-S., Ahn, H., Choi, E.-J., Song, W.-Y....Youn, H. (2015). Comparison of risk and protective factors associated with smartphone addiction and Internet addiction. *Journal of behavioral addictions*, 4(4), 308-314.
16. Chóliz, M. M. (2010). *Mobile Phone Addiction in Adolescence: Evaluation and Prevention of Mobile Addiction in Teenagers*. Saarbrücken: Lambert Academic Publishing.
17. Chóliz, M. M. (2012). Mobile-phone addiction in adolescence: the test of mobile phone dependence (TMD). *Progress in Health Sciences*, 2(1), 33-44.
18. Dixit, S., Shukla, H., Bhagwat, A., Bindal, A., Goyal, A., Zaidi, A., & Shrivastava, A. (2010). A study to evaluate mobile phone dependence among students of a medical college and associated hospital of central India. *Indian Journal of Community Medicine*, 35(2), 339-341.
19. Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2016). Fear of missing out, need for touch, anxiety and depression are related to problematic smartphone use. *Computers in Human Behavior*, 63, 509-516.
20. Erdem, H., Kalkin, G., Turen, U., & Deniz, M. (2016). The Effects of No Mobile Phone Phobia (Nomofobi) on Academic Performance among Undergraduate Students [Üniversite Öğrencilerinde Mobil Telefon Yoksunluğu Korkusunun (nomofobi) Akademik Başarıya Etkisi]. *Süleyman Demirel University. The Journal of Faculty of Economics and Administrative Sciences*, 21(3), 923-936.
21. Field, A. (2005). *Discovering statistics using SPSS* (2nd Ed.). London: Sage Publication.
22. Fraenkel, J. R., & Wallen, N. E. (2006). *How to design and evaluate research in education*. New York: McGraw-Hill.
23. Gezgin, D. M., & Cakir, O. (2016). Analysis of nomophobic behaviors of adolescents regarding various factors. *Journal of Human Sciences*, 13(2), 2504-2519.
24. Gezgin, D. M., Cakir, O., & Yildirim, S. (2016, June). *The Relationship between Levels of Nomophobia Prevalence and Internet Addiction among Adolescents [Ergenler arasında Nomofobi Yaygınlık Düzeyinin İnternet Bağımlılığı ile İlişkisi].* Paper presented at the 3rd International Eurasian Educational Research Congress, Ejer 2016, Muğla, Turkey.
25. Gezgin, D. M., Sahin, Y. L., & Yildirim, S. (2017). The Investigation of Social Network Users' Nomophobia Levels regarding to various Factors [Sosyal Ağ

kullanıcıları arasinda nomofobi yayginliğinin çeşitli faktörler açısından incelenmesi]. *Educational Technology Theory and Practice*, 7(1), 1-15.

26. Gezgin, D. M., Sumuer, E., Arslan, O., & Yildirim, S. (2017). Nomophobia Prevalence among Pre-service Teachers: A case of Trakya University [Öğretmen Adayları Arasında Nomofobi Yaygınlığı: Trakya Üniversitesi Örneği]. *Trakya University Journal of Education Faculty*, 7(1), 86-95.
27. Gupta, N., Garg, S., & Arora, K. (2016). Pattern of mobile phone usage and its effects on psychological health, sleep, and academic performance in students of a medical university. *National Journal of Physiology, Pharmacy & Pharmacology*, 6(2), 132-139.
28. Ha, J. H., Chin, B., Park, D. H., Ryu, S. H., & Yu, J. (2008). Characteristics of excessive cellular phone use in Korean adolescents. *CyberPsychology & Behavior*, 11(6), 783-784.
29. Hetz, P. R., Dawson, C. L., & Cullen, T. A. (2015). Social media use and the fear of missing out (FoMO) while studying abroad. *Journal of Research on Technology in Education*, 47(4), 259-272.
30. Hong, F.-Y., Chiu, S.-I., & Huang, D.-H. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese University female students. *Computers in Human Behavior*, 28(6), 2152-2159.
31. Kalaskar, P. B. (2015). *A study of awareness of development of NoMoPhobia condition in smartphone user management students in Pune city*. INCON 2015. E-issn-2320-0065.
32. Kaur, A., & Sharma, P. (2015). A Descriptive Study to Assess the Risk of Developing Nomophobia among Students of Selected Nursing Colleges Ludhiana, Punjab. *International Journal of Psychiatric Nursing*, 1(2), 1-6
33. King, A. L. S., Valença, A. M., Silva, A. C., Baczynski, T., Carvalho, M. R., & Nardi, A. E. (2013). Nomophobia: dependency on virtual environments or social phobia? *Computers in Human Behavior*, 29(1), 140-144.
34. Krajewska-Kułak, E., Kułak, W., Stryzhak, A., Szpakow, A., Prokopowicz, W., & Marcinkowski, J. T. (2012). Problematic mobile phone using among the Polish and Belarusian University students, a comparative study. *Progress in Health Sciences*, 2(1), 45-50.
35. Kwon, M., Lee, J.-Y., Won, W.-Y., Park, J.-W., Min, J.-A., Hahn, C….Kim, D.-J. (2013). Development and validation of a smartphone addiction scale (SAS). *PloS One*, 8(2), e56936

36. Lapointe, L., Boudreau-Pinsonneault, C., & Vaghefi, I. (2013). Is smartphone usage truly smart? A qualitative investigation of IT addictive behaviors. In *Proceedings of HICSS '13 46th Hawaii International Conference on System Sciences* (pp. 1063-1072), IEEE Computer Society Washington, DC, USA.
37. Lee, U., Lee, J., Ko, M., Lee, C., Kim, Y., Yang, S....Song, J. (2014). Hooked on smartphones: an exploratory study on smartphone overuse among college students. In *Proceedings of the SIGCHI 32nd Annual ACM Conference on Human Factors in Computing Systems* (pp. 2327-2336). ACM, New York, NY, USA.
38. Lee, Y., Chang, C., Lin, Y., & Cheng, Z. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior*, 31, 373-383.
39. Lin, S. S. J., & Tsai, C.-C. (2002). Sensation seeking and internet dependence of Taiwanese high school adolescents. *Computers in Human Behavior*, 18(4), 411-426.
40. Newport, F. (2015) Most U.S. *Smartphone Owners Check Phone at Least Hourly*. Retrieved from http://www.gallup.com/poll/184046/smartphone-owners-check-phone-least-hourly.aspx on August 09, 2016.
41. Nielsen, P., & Fjuk, A. (2010). The reality beyond the hype: Mobile Internet is primarily an extension of PC-based Internet. *The Information Society*, 26(5), 375-382.
42. Okazaki, S., & Hirose, M. (2009). Does gender affect media choice in travel information search? On the use of mobile Internet. *Tourism Management*, 30(6), 794-804.
43. Oksman, V., & Turtiainen, J. (2004). Mobile communication as a social stage. The meanings of mobile communication among teenagers in Finland. *New Media & Society*, 6(3), 319-339.
44. Oulasvirta, A., Rattenbury, T., Ma, L., & Raita, E. (2012). Habits make smartphone use more pervasive. *Personal and Ubiquitous Computing*, 16(1), 105-114
45. Park, J. C., Hyun, S. J., & Ha, H. (2014). Comparison between the internet and mobile phone addiction of adolescent with structural equation model and dominance analysis. *The Journal of Korean Association of Computer Education*, 16(1), 11-22.
46. Park, W. K. (2005). Mobile phone addiction. In R. Ling & Per E. Pedersen (Eds.), *Mobile communications* (pp. 253-272). Springer: London.
47. Pavithra, M. B., Madhukumar, S., & Mahadeva, M. (2015). A Study on Nomophobia-Mobile Phone Dependence, Among Students of a Medical College in Bangalore. *National Journal of Community Medicine*, 6(3), 340-344.

48. Pellowe, E. L., Cooper, A., & Mattingly, B. A. (2015). Are Smart Phones Inhibiting Smartness? Smart Phone Presence, Mobile Phone Anxiety, and Cognitive Performance. *Undergraduate Journal of Psychology*, 28(1), 20-25.
49. Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29(4), 1841-1848.
50. Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior*, 29(6), 2632-2639.
51. Sharma, N., Sharma, P., Sharma, N., & Wavare, R. R. (2015). Rising concern of nomophobia amongst Indian medical students. *International Journal of Research in Medical Sciences*, 3(3), 705-707. doi:10.5455/2320-6012.ijrms20150333.
52. Shin, L. (2014). A Comparative Study of Mobile Internet Usage between the US and Korea. *Journal of European Psychology Students*, 5(3), 46-55.
53. Singh, B., Gupta, R., & Garg, R. (2013). Mobile Phones; A Boon or Bane for Mankind?-Behavior of Medical Students. *International Journal of Innovative Research and Development*, 2(4), 196-205.
54. Singh, J. D., & Yadav, R. A. (2015). Health Complications Caused By Excessive Use of Smartphones. *Global Journal of Multidisciplinary Studies*, 4(2), n.p.
55. Škařupová, K., Ólafsson, K., & Blinka, L. (2016). The effect of smartphone use on trends in European adolescents' excessive Internet use. *Behaviour & Information Technology*, 35(1), 68-74.
56. Spitzer, M. (2015). Smartphones, Angst und Stress. Nervenheilkunde, 34, 591-600.
57. Szpakow, A., Stryzhak, A., & Prokopowicz, W. (2011). Evaluation of threat of mobile phone–addition among Belarusian University students. *Progress in Health Sciences*, 1(2), 96-100.
58. Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th Ed.). Boston MA: Allyn & Bacon.
59. Takao, M., Takahashi, S., & Kitamura, M. (2009). Addictive personality and problematic mobile phone use. *CyberPsychology & Behavior*, 12(5), 501-507.
60. Tavolacci, M. P., Meyrignac, G., Richard, L., Dechelotte, P., & Ladner, J. (2015). Problematic use of mobile phone and nomophobia among French college students. *European Journal of Public Health*, 25(suppl 3), ckv172-088.
61. Thomée, S., Härenstam, A., & Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults-a prospective cohort study. *BMC Public Health*, 11(66), n.p.

62. Uysal, Ş., Özen, H., & Madenoğlu, C. (2016). Social Phobia in Higher Education: The Influence of Nomophobia on Social Phobia. *The Global e-learning Journal*, 5(2), 1-8.
63. Van Deursen, A. J., Bolle, C. L., Hegner, S. M., & Kommers, P. A. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in Human Behavior*, 45, 411-420.
64. Walsh, S. P., White, K. M., & Young, R. M. (2008). Over-connected? A qualitative exploration of the relationship between Australian youth and their mobile phones. *Journal of Adolescence*, 31(1), 77-92.
65. Wang, J. L., Wang, H. Z., Gaskin, J., & Wang, L. H. (2015). The role of stress and motivation in problematic smartphone use among college students. *Computers in Human Behavior*, 53, 181-188.
66. Yildirim, C., & Correia, A.-P. (2015). Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. *Computers in Human Behavior*, 49, 130-137.
67. Yildirim, C., Sumuer, E., Adnan, M., & Yildirim, S. (2016). A growing fear: Prevalence of nomophobia among Turkish college students. *Information Development*, 32(5), 1322-1331.
68. Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology & Behavior*, 1(3), 237-244.