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NOMOPHOBIA AMONG UNDERGRADUATE STUDENTS: THE CASE OF A TURKISH STATE UNIVERSITY

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Abstract
The research aimed to investigate undergraduate students' nomophobic behavior; and its relationship with certain demographics and certain mobile phone activities. Moreover, it was explored whether there were any significant differences among the four sub-dimensions of nomophobia: "not being able to communicate", "losing connectedness", "not being able to access information", and "giving up convenience". A correlational research design was employed with a sample of 146 undergraduate students from four different faculties of a Turkish state university by using convenience sampling method. The Turkish Nomophobia Questionnaire was used for data collection. By conducting One-Way Repeated ANOVA, a significant difference between the mean scores of four dimensions was found. While the students' scores on the fear of "losing connectedness" were significantly lower than the other three factors, the fear of "not being able to access information" had the highest mean scores. There was no difference between the factors "not being able to access information" and "not being able to communicate". Furthermore, the Pearson' Product Moment correlation was performed; its results indicated that there was a weak, yet significant, correlation between gender and the sub-dimension of "not being able to communicate". There was also a weak positive correlation between the Internet browsing and the four dimensions of nomophobia. The study also found a weak positive correlation between learning/education and the level of "not being able to access information".

Keywords: Nomophobia, smartphone, educational mobile phone use, undergraduate students.

INTRODUCTION

Today, technology has embedded in the core of our life. Mobility feature of technology triggers this situation because of meeting direct and instant needs at the site of use. Hence mobile communication has taken a prominent place in users' daily communicative practices through telephony, web access, and applications (Kang & Jung et al., 2014). However, how it affects our life is still vague. King and his colleagues (2010) stated in their analysis of individuals' communication that people acquired certain habits by modern devices. While these habits include good aspects such as convenience, comfort, and availability, some have bad aspects such as pathological dependency, fear, and anxiety as the result of not being able to use those modern devices. It is clear that people are becoming increasingly reliant on technology with its positive and negative aspects. According to the report of the International Telecommunications Union (2014), smartphone ownership is more popular among young people in the world as well as in Turkey. What makes smartphones so popular among young adults are under three main items, which are psychological needs and motives, content-specific motivations, and social communication (Aoki & Downes, 2003; Ho & Syu, 2010; cited in Kang & Jung, 2014). It is clear that smartphones provide noticeable benefits, and help people satisfy their needs;

but on the other hand, some recent studies show that people exhibit physical, mental, emotional, and other symptoms when they are deprived of their mobile phones. Compulsive checking habit, overdependence on a smartphone or mobile phone addiction can be shown as examples related to problems as mentioned above (Oulasvirta et al., 2012; Billieux et al., 2007, 2008; Hong, Chiu, & Huang, 2012). Another problem related to mobile phone use behavior is "nomophobia" –"no mobile phone phobia"- which means "the fear of being out of mobile phone contact" (SecurEnvoy, 2012, p.1). People who have such symptoms means afflicted, are called "nomophobe" and characteristics of describing nomophobe are called "nomophobic." Despite evolvement in the definition, nomophobia can be generally defined as a psychological fear of losing connectivity via mobile phone or any other virtual communication devices. All these issues mentioned above were about the impact of smartphones on our daily life regarding both bad and good aspects. However, besides of impact on daily life, technology is increasingly beginning to play a part in an educational environment, as well. Among new technologies leading to significant changes in education, fields are distance education, e-learning and consequently mobile learning. The term "mobile learning" refers to the use of mobile or wireless devices for the purpose of learning while on the move. Basically, three unique features of mobile learning which are personalized, authentic, and situated make mobile learning different from other media usage in learning (computer-based, web-based and so on).

The aim of this study was to investigate the level of nomophobic behavior of the undergraduate students in the case of a Turkish state university. Specifically, the following research questions were addressed in this study:

- Is there any significant difference among the sub-dimensions of nomophobia ("not being able to communicate", "losing connectedness", "not being able to access information", and "giving up convenience")?
- Is there any relationship between nomophobia level and certain demographics (gender, age, duration of cell phone ownership, and duration of a smartphone ownership)?
- Is there any relationship between nomophobia level and the frequency of using mobile services (messaging, Internet browsing, games/music, learning/education)?

METHOD

Research Design

The study utilized a correlational research design in which the researchers aim to explore the possible association between two or more variables with no attempt to control them (Frankel, Wallen, & Huyn, 2012).

Sample

The sample of the study included 146 undergraduate students from a Turkish state university in Ankara. The nonrandom convenience sampling method was used in the present study to collect data. Out of 146 students, 72 (49.3%) of them were female, and 74 (50.7%) of them were male. The participants were from four different faculties and all level of study. The majority of participants (n = 81) were studying in the faculty of education (55.48%) as seen in Table 1. The rest of participation was as follows: 39 of them from the faculty of engineering (26.71%); 20 of them from the faculty of economics and administrative sciences; the minority of the participants (n = 6) from the faculty of arts and science. Out of 146 students, 55 of them (37.7%) were junior, 51 (35.6%) of them were senior students, 36 (24.7%) of them were sophomore, and 3 (2.1%) were freshman students.

Table 1: Distribution of the Gender, Faculties, and Study Year

Variables	*f*	*%*
Gender		
Female	72	49.3
Male	74	50.7
Faculty		
Arts & Science	6	4,11

Economics & Administrative Sciences	20	13.70
Education	81	55.48
Engineering	39	26.71
Study Year		
Freshman (1.)	3	2.1
Sophomore (2.)	36	24.7
Junior (3.)	55	37.7
Senior (4.)	52	35.6
Total	146	100.0

Data Collection

The survey used for the present study had two parts. The first part included the Nomophobia Questionnaire (NMP-Q), which was developed by Yildirim and Correia (2015). The NMP-Q had 20 items with four factors as followings: (I) "not being able to communicate" – 6 items; (II) "losing connectedness" – 5 items; (III) "not being able to access information" – 4 items; and (IV) "giving up convenience" – 5 items. The scale was 7-point Likert type ranging between 1 – "strongly disagree" and 7 – "strongly agree".

Table 2: The Dimensions and the Number of Items in the Nomophobia Questionnaire

Dimensions	Number of items	Sample Item
I: Not being able to communicate	6	10-15
II: Losing connectedness	5	16-20
III: Not being able to access information	4	1-4
IV: Giving up convenience	5	5-9

The scale was translated to the Turkish language by Yildirim, Sumuer, Adnan, and Yildirim (2016). They extracted four factors as the original one, and had good construct validity. In addition, they reported that acceptable alpha coefficients were obtained, which were above .70 (Field, 2009; Kline, 1999). The Cronbach coefficients of four sub-dimensions were .90, .74, .94, and .91, respectively. Arpaci (2017) also validated the scale and found a good construct validity and high-reliability coefficients for each dimension; .86, .84, .92., and .88. Thus, a validation study was not needed to perform again. The demographic information (gender, age, year of study, and department) was gathered from the second part of the instrument. This part also included some technology use related questions as followings: the year of cell phone ownership, the year of smartphone ownership, and the frequencies of mobile phone activities (messaging, Internet surfing, game/music, and learning/education).

Before collecting data, the ethical approval was taken for aforementioned university from the Research Center for Applied Ethics at Middle East Technical University. The data were collected during the fall semester of 2015-2016. The researcher distributed hand-delivered questionnaire and administrated face-to-face. The survey took approximately 10 minutes to complete. The students participated voluntarily in the study. They also were informed about the confidentiality of their responses.

Data Analysis

For the current study, descriptive and inferential statistical analyses were conducted via SPSS 22.0. The descriptive analysis was presented with the frequencies, percentages, mean, and standard deviations in Table 3.

Table 3: Descriptive Statistics

Variables	*M*	*SD*	*f*	%
Age	22.45	2.30	-	-
Smart Phone Ownership (in year)	9.11	2.71	-	-
Cell Phone Ownership (in year)	3.74	1.87	-	-
Activities in Mobile Phone				
Messaging				
0 – 5	-	-	38	26.0
> 5	-	-	108	74.0
Internet Browsing				
0 – 5	-	-	33	22.6
> 5	-	-	113	77.4
Games/Music				
0 – 5	-	-	68	46.6
> 5	-	-	78	53.4
Learning/Education				
0 – 5	-	-	77	52.7
> 5	-	-	69	47.3

In the present study, the dimensions of nomophobia scale were compared by using One-Way Repeated Measures of Analysis of Variance (ANOVA). Additionally, the Pearson correlation coefficients were performed to investigate the relationship between nomophobia and certain demographics. Similarly, to examine the relationship between the factors of nomophobia and activities done in a mobile phone, the Pearson correlations were employed. Before all analyses, the assumptions for each analysis were checked, and the results were satisfying

RESULTS

Is there any significant difference among the sub-dimensions of nomophobia ("not being able to communicate", "losing connectedness", "not being able to access information", and "giving up convenience")?

A one-way within-subjects ANOVA was performed to investigate the mean difference among the dimensions of nomophobia ("not being able to communicate", "losing connectedness", "not being able to access information", and "giving up convenience"). The Huyn-Feldt values were applied since the sphericity assumption was violated (because it was found significant, p = .000). The main effect of dimensions of nomophobia was significant, F (2.54, 368.45) = 40.96, p = .00, η^2 =.22. Thus, it was concluded that it is a large effect, and 22% of the variance in the undergraduate students' level of nomophobia was accounted for by the factors of nomophobia, namely, "not being able to communicate", "losing connectedness", "not being able to access information", and "giving up convenience". (see Table 3).

Table 3: ANOVA Results

Source	*SS*	*df*	*MS*	*F*	*η2*
Factors of nomophobia	123.34	2.54	48.54	40.96	.22
Error	436.68	368.45	1.19		

*p<.05

In addition, the dimensions of nomophobia were compared. The alpha level was calculated as .0083 by dividing .05 into the number of compared groups (6). According to the paired difference, a significant difference was found out between undergraduate students' fear of "not being able to access information" (M = 4.40, SD = .15) and "losing connectedness" (M = 3.17, SD = .15). This

shows that students' scores on the dimension of "not being able to access information" were significantly higher than "losing connectedness", t (145) = 8.97, p < .0083. Similarly, there is a significant difference between students' fear of "not being able to access information" and "giving up convenience" (*M* = 3.93, *SD* = .13). This also indicated that students' scores on the dimension of not being to access information were higher than "giving up convenience", *t* (145) = 4.29, *p* < .0083. There is a significant difference between the fear of students' "losing connectedness" and "not being able to communicate" and "not being able to communicate" (*M* = 4.15, *SD* = .14) and "losing connectedness". This means that students' scores on the factor of "losing connectedness" were lower than "not being able to communicate", *t* (145) = -8.71, *p* < .0083. Similarly, there is a significant difference between the students' fear of "losing connectedness" and "giving up convenience". This means that students' scores on the factor of "losing connectedness" were lower than "giving up convenience" *t* (145) = -8.57, *p* < .0083 (see Table 4).

Table 4: Paired Difference of Factors of Nomophobia

I (Factors of Nomophobia)	*J* (Factors of Nomophobia)	Mean Difference (*I-J*)
(1) Not being able to communicate	(2) Losing connectedness	.98*
	(3) Not being able to access information	-.25
	(4) Giving up convenience	.22
(2) Losing connectedness	(3) Not being able to access information	-1.23*
	(4) Giving up convenience	-.76*
(3) Not being able to access information	(4) Giving up convenience	.47*

Is there a relationship between the students' nomophobia level and the certain demographics (gender, age, the duration of cell phone, and the duration of smart phone)?

The Pearson correlations were performed to investigate the relationship between the factors of nomophobia level and the certain demographics. The results showed that gender and the duration of smartphone ownership had a relationship with some of the dimensions of nomophobia. According to Cohen (1988), the relationship is determined as "weak" when correlation coefficients are between .10 and .29. Thus, as seen in table 5, there was a weak and negative between gender and the factor of "not being able to communicate" (*r* = -.23), and the factor of "giving up convenience" (*r* = -.17). The meaning of negative correlation between gender and two dimensions of nomophobia was that female students had a higher level than male students. More specifically, the factors of "not being able to communicate" and "giving up convenience" of female students were higher than male students. While there was not any relationship between nomophobia and the duration of cell phone ownership; the duration of smartphone ownership had a weak positive relationship with the factor of "not being able to access information" (*r* = .17) and the factor of "giving up convenience" (*r* = .21). Besides, the total nomophobia had a weak positive relationship only with the duration of smartphone ownership (*r* = .19).

Table 5: The Relationship *between the Dimensions of Nomophobia and Certain Demographics*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Total Nomophobia	-								
(2) Not being able to communicate	.87**	-							
(3) Losing connectedness	.88**	.68**	-						
(4) Not being able to access information	.77**	.52**	.55**	-					
(5) Giving up convenience	.91**	.70**	.79**	.68**	-				
(6) Age	-.00	-.06	-.01	.13	-.03	-			
(7) Gender	-.15	**-.23****	-.04	-.06	**-.17***	.29**	-		

(8) The Duration of Cell Phone Ownership	.09	.07	.04	.15	.06	.43**	.21*	-	
(9) The Duration of Smart Phone Ownership	**.19***	.16	.13	**.17***	**.21***	.20*	.15	.29**	-

** $p < .001$ (2-tailed), *$p < .05$ (2-tailed)

How the students use their mobile phones? Is there a relationship between the activities do with mobile phones and nomophobia level?

The students were also asked how frequently they use certain activities (messaging, Internet browsing, game/music, and learning/education) with their mobile phones in a day. A 2-point response format from 1 (0-5 times in a day) to 1 (more than 5 times in a day) was used. As seen Table 4, the activities rated most common were as followings: the Internet browsing (*77.4*%), messaging (*74.0*%), game/music (53.4%), and lastly learning/education (47.3%), respectively. This means that students were mostly browsing Internet with their mobile phones and they used at least for learning and education in a day.

Table 4: The Students' Mobile Phone Use Frequency in A Day

Use in a day	Messaging (*f*)	Internet browsing (*f*)	Game/Music (*f*)	Learning/Education (*f*)
0 – 5	38 (26.0)	33 (22.6)	68 (46.6)	77 (52.7)
> 5	108 (74.0)	113 (77.4)	78 (53.4)	69 (47.3)

In order to examine the relationship between the factors of nomophobia and certain activities, the Pearson correlation coefficient was employed. The results showed that browsing the Internet was had a relationship with total nomophobia and two dimensions of nomophobia. All correlations were weak and positive as follows: total nomophobia (r = .20), "giving up convenience" (r = .20), "losing connectedness" (r = .18), and "not being able to access information" (r = .16). Moreover, there was a weak yet significant relationship between the factor of "not being able to access information" and learning/education.

Table 5: The Relationship between the Dimensions of Nomophobia and Certain Activities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Total Nomophobia	-								
(2) Not being able to communicate	.87**	-							
(3) Losing connectedness	.88**	.68**	-						
(4) Not being able to access information	.77**	.52**	.55**	-					
(5) Giving up convenience	.91**	.70**	.79**	.68**	-				
(6) Messaging	.04	.00	.05	.03	.06	-			
(7) Internet Browser	**.20***	.15	**.21***	.13	**.18***	.43**	-		
(8) Game/Music	-.02	-.01	.01	-.02	-.07	.32**	.38**	-	
(9) Learning/Education	.11	.07	.06	**.20***	.07	.19*	.22**	.33**	-

** $p < .001$ (2-tailed), *$p < .05$ (2-tailed)

DISCUSSION AND CONCLUSION

The present study, firstly, aimed to investigate undergraduate students' nomophobia level by comparing its four sub-dimensions, which were "not being able to communicate", losing connectedness, "not being able to access information", and "giving up convenience". Secondly, the study aimed to find out whether any of the dimensions of nomophobia had a significant relationship with certain demographic variables and certain mobile phone activities. The results showed that there was a significant difference between the mean scores of four subscales of nomophobia questionnaire. In detail, students' fear of "losing connectedness" was significantly lower than the other three factors. While the students' fear of "not being able to access information" was significantly higher than the factor of "giving up convenience", no difference was observed with the factor of "not being able to communicate". In other words, the undergraduate students showed a higher level of fear regarding

the factors "not being able to communicate" and "not being able to access information." The present study was consistent with the study of Yildirim et al. (2015). Furthermore, research on mobile phone use in higher education revealed that communication (e.g., Carini, Kuh, & Klein, 2006; Kuh, Cruce, Shoup, Kinsie, & Gonyea, 2008; Bomhold, 2013; Laurcicella and Kay, 2013; Moreira, Ferreira, Santos, & Durao, 2016) and seeking information were two major motivations of students (Wai et al., 2018; Sawaya; 2015; Quinn, 2013; Clough et al., 2007). Thus, it might be said mobile phones play an important role in undergraduate students' lives regarding communication and access information. The relationship between the sub-dimensions of nomophobia and certain demographics was also examined. The findings showed that there was a weak, yet significant relationship between gender and both the factors of "not being able to communicate" and "giving up convenience". More specifically, female students had a higher level of fear in the factors of "not being able to communicate" and "giving up convenience" than male students. However, the literature showed mixed results related to gender. While some studies reported that gender had a significant effect on nomophobia (Mail Online, 2008), some reported that there was no difference (Uysal, Özen, & Madenoğlu, 2016; Gezgin, Sumuer, Arslan, & Yildirim, 2016; Adnan & Gezgin 2016; Dixit et al. 2010). The duration of smartphone ownership was the only variable which had a significant relationship with total nomophobia level. Besides, it had a weak positive relationship with the subscale of "not being able to access information" and with the subscale of "giving up convenience". This result showed consistency with the previous studies (Gezgin et al., 2016; Yildirim et al., 2016; Yildirim & Correia, 2015). The other demographics, age and the duration of cell phone ownership, had no relationship with nomophobia level, which was consistent with the previous studies (Gezgin et al., 2016; Adnan & Gezgin, 2016; Yildirim et al., 2015). Among the mobile phone activities, browsing the Internet was the only variable which had a significant relationship with all factors of nomophobia. In the literature, some studies also pointed out the relationship between Internet use and problematic mobile phone use (Ha, Kim, Bae et al., 2007; Jenaro, Flores, Gomez-Vela, Gobzalez-Gil, & Caballo, 2007; Ha & Chin, Parl, Ryu, & Yu et al., 2008). Thus, it might be said that the strong relationship between nomophobia and Internet use might be explained by the Internet addiction. Besides, there was a significant relationship between the fear of "not being able to access information" and learning/education. Accordingly, it might be said that students use their smartphone for the educational purposes as well. In the literature, the role of mobile phone use in education varies despite offering several opportunities (Losh, 2014; Lockhart, 2016). In other words, while some researcher considers mobile phones as a facilitator in the learning environment, others consider them as disruptive and unsuitable tools. To sum up, the present will give insight into understanding nomophobia and its relationship certain demographics and certain mobile phone activities. Moreover, this study will provide preliminary evidence to investigate both facilitation and distraction roles of mobile phones in learning environments. The future research might emphasize on the reasons of nomophobia and its relationship with mobile learning through more in-depth qualitative investigation.

Note: Abstract of this study has been presented in the EJER 2018 conference.

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