

The Mediating Role of Self-Control in the Relationship between Nomophobia and Basic Psychological Needs in University Students*

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Abstract

This research aims to determine the mediating role of self-control in the relationship between basic psychological needs and nomophobia. The study employed a relational survey method in which the relations between the variables are examined within the framework of the structural equation model. The sample of the study consists of 688 students selected according to stratification and convenient sampling. Personal information form, Nomophobia Scale, Need Satisfaction Scale, and Self Management scale was used in the study. The data were analysed using the SPSS 22 and AMOS 20 programs. According to research results, 0.4% of university students did not have a nomophobic tendency, 65.7% had a mild nomophobic tendency, 30.8% moderate nomophobic tendency, and 3.1% had an extreme nomophobic tendency. In addition, need satisfaction predicted self-control positively, while self-control predicted nomophobia negatively. With the inclusion of the self-control variable as a mediator in the model, the predictive power of need satisfaction of nomophobia lost its significance. Need satisfaction predicts nomophobia on self-control significantly. It can indicated that the coefficients of the direct and indirect paths that emerged as a result of the Bootstrap analysis are significant and that it assumes the role of a full mediator of self-control.

Keywords Basic Psychological Needs, Nomophobia, Self-Control, Self-Determination Theory

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INTRODUCTION

Behavioral addictions are the type of addiction that has reached a dangerous level with substance addictions. The high number of behavioral addictions suggests that there are leading factors affecting each addiction (Gunlu & Ceyhan, 2017). Despite numerous studies on internet addiction, there is still no consensus on the factors that affect internet addiction (Uz Bař et al., 2016). Experiencing new problems due to internet addiction makes it difficult to understand the causes of internet addiction (Günlü & Uz Bař, 2022). One of the problems caused by smartphone addiction along with internet addiction is nomophobia. Yıldırım (2014) determined that there are four dimensions of nomophobia in the nomophobia scale. Therefore, as soon as the individuals cannot benefit from the smartphone in line with its intended use, they may experience significant problems in one or more of these four dimensions (Elhai et al., 2017; Sharma et al., 2015). There is a positive relationship between an individual's social anxiety and nomophobia levels (Dixit et al., 2010; Tams et al., 2018). For this reason, the individual can easily exhibit behaviors that limit his freedom and movements to keep the smartphone active (King et al., 2010). In studies in the literature, nomophobia; gender, age, and grade level (Adnan & Gezgin, 2016; Dongre et al., 2017), smartphone usage time (Jena, 2015; Pavithra et al., 2015), academic achievement (Erdem et al., 2016, Hořgör, 2020), phone usage purposes (Ařık, 2018; Erdem et al., 2016; Jing et al., 2020), availability of spare chargers (Kaplan-Smart & Seyahat, 2016) relationship has been studied.

Considering the studies on the subject of nomophobia, it's seen that the dimensions are aimed at meeting the psychological needs of the individual (Cihangir-Çankaya, 2009b; Schultz & Schultz, 2005). Another theory that deals with needs is Deci and Ryan's "Self-Determination Theory". The needs in the self-determination theory are basic psychological needs and these are; autonomy, competence, and relatedness (Deci & Ryan, 2000). The need, the importance of which is emphasized in the self-determination theory, assumes an energy task that directs the actions of the individual (Coleman, 2000).

Whether psychological needs differ according to demographic variables in the literature (Gündođdu & Yavuzer, 2012; Türkçapar & Yasul, 2020); needs satisfaction and individual well-being levels and autonomy support and satisfaction of basic psychological needs (Cihangir-Çankaya, 2009a; Lin & Chan, 2020); whether psychological needs satisfaction differs according to the gender variable (Cihangir-Çankaya, 2009b; Neufeld et al., 2020); the effect of need satisfaction on subjective well-being (Chirkov et al., 2003); change in internet addiction levels according to psychological needs (Canođulları & Güçlüray, 2017); the relationship between Facebook use and basic psychological needs (Greitemeyer et al., 2014).

It is known that it is essential for the individual to act with self-control and to act with this awareness by taking responsibility for his/her behaviors. Low self-control is associated with problems such as alcohol and substance use, and engaging in aggressive and violent acts (Allahverdiipour et al., 2006; Friese & Holfman, 2009). Therefore, especially self-control theories are used to explain behavioral and impulsive problems (Ercořkun, 2016; Özdemir et al., 2014).

In the literature, the relationship between self-control variable and purpose of internet use, internet addiction, personality traits, psychological symptoms, self-control, general procrastination behavior; alcohol consumption, problem alcohol use and self-control (Akkuř-Çutuk, 2020; Boyalı, 2020; Durak-Batıgün & Kılıç, 2011; Ekři et al., 2019; Ford & Blumenstein, 2013; Foster et al., 2014; Kara & Ceyhan, 2017; Pearson Kite & Henson, 2013). It is seen that there are studies with variables such as the mediating role of self-control in online violent video games and online aggressive behaviors (Zheng et al., 2021). In addition, the relationship between basic psychological needs and nomophobia (Maeng & Arbeau, 2018); there are studies on the relationship between nomophobia levels, the satisfaction of psychological needs, and personality traits (Sezer & Yıldırım, 2020).

It is seen that there are many studies conducted with different variables in the literature. Unfortunately, there is no study was found to determine the mediating role of self-control in the

relationship between basic psychological needs and nomophobia. Therefore, the present study aims to determine the mediating role of self-control in the relationship between basic psychological needs and nomophobia.

METHODS

Research design

This research is a relational survey method in which the relationships between variables are examined within the framework of the structural equation model. The structural equation model is based on testing the effects between observable and latent variables in a single model (Fraenkel et al., 2012; Meydan & Şeşen, 2015).

Participants

The sample of the study consisted of 688 students. Stratification and convenient sampling methods were used to determine the sample (Johns & Christensen, 2014). Demographic characteristics of the sample are given in Table 1.

Table 1 Demographic characteristics of the students in the study group

		Gender		
		Female	Male	Total
University	Dokuz Eylul University	172	149	321
	Pamukkale University	190	177	367
	Total	362	326	688
Faculty	Faculty of Education	134	58	192
	Faculty of Economics and Administrative Sciences	113	103	216
	Engineering Faculty	58	128	186
	Faculty of Nursing	35	7	42
	Faculty of Theology	16	18	34
	Faculty of Arts	6	12	18
	Total	362	326	688
Department	Psychological Counseling and Guidance	43	16	59
	Pre-school teacher	38	17	55
	Classroom teacher	29	17	46
	English teacher	15	8	23
	Business	23	29	52
	Economy	29	36	65
	Finance	34	18	52
	Public Administration	27	20	47
	Mechanical Engineering	17	32	49
	Civil Engineering	7	31	38
	Computer Engineering	27	30	57
	Electrical Electronics Engineering	7	35	42
	Nursing	35	7	42
	Theology	16	18	34
	Picture-Music	15	12	27
Total	362	326	688	
Grade level	First	65	66	131
	Second	104	96	200
	Third	126	90	216
	Fourth	67	74	141
	Total	362	326	688
Age	17	1	-	1
	18	19	9	28
	19	53	45	98
	20	105	57	162
	21	85	83	168

22	47	51	98
23	26	45	71
24	15	17	32
over 25 years old	11	19	30
Total	362	326	688

Nomophobia scale

The Nomophobia Scale (NMP-Q) was developed by Yildirim and Correia (2015) and adapted into Turkish by Yildirim et al., (2015). The Nomophobia Scale consists of 20 items, 4 factors, and is scored on a 7-point Likert scale. The total score that can be obtained from the Nomophobia Scale varies between 20 and 140 (Yildirim et al., 2015). The overall Cronbach Alpha reliability coefficient of the scale was calculated as .92 (Yildirim et al., 2015). In the current study, the overall Cronbach Alpha reliability of the scale was determined to be .88. Whether the structure of the scale was confirmed in Turkish culture was determined by the confirmatory factor analysis method. The obtained confirmatory factor analysis values were calculated as $\chi^2/sd= 2.86$, CFI= .92, RMSEA= .08. Therefore, these values were found to be among acceptable values (Yildirim et al., 2015)

Need satisfaction scale

Need Satisfaction Scale (ISS) was developed by Deci and Ryan (1991) and adapted into Turkish by Cihangir Çankaya and Bacanlı (2003). Need Satisfaction Scale consists of 21 items, in three dimensions, and is scored in a 7-point Likert type. Dimensions in the scale; autonomy, competence, and relatedness. The total score in the scale can be scored between a minimum of 21 and a maximum of 147 (Cihangir Çankaya & Bacanlı, 2003). The test-retest correlation value of the scale was .89 for the overall scale; .80, .81, and 0.89 for the dimensions. In the current study, the Cronbach Alpha reliability coefficient of the scale was .93 for the overall reliability of the scale dimensions .79, .83 and .87. Factor analysis, discriminant validity and criterion validity methods were used in the validity study of the scale. It was determined that the three-factor structure of the scale was valid. The fit values of the model are RMSEA= .07, GFI= .86, AGFI= .82, CFI= .82 is calculated as NNFI= .80. It is seen that these obtained values are acceptable.

Self-control and self-management scale (SCSMS)

It was developed by Mezo (2009) and adapted into Turkish by Akın et al. (2012). SCSMS consists of a total of 16 items with three factors and is scored in a 6-point Likert type. There are three dimensions in the scale: self-monitoring, self-evaluation and self-empowerment. The scores in the dimensions are 0-30, respectively; It varies between 0-25 and 0-25. High scores obtained from the scale indicate that the individual has high skills in these dimensions. The Cronbach Alpha reliability coefficient of the scale was calculated as .80 for the overall scale (Akın et al., 2012). In the current study, the Cronbach Alpha reliability coefficient was .90 for the overall scale. The confirmatory factor analysis method was used to determine the construct validity of the scale. The model fit values obtained were calculated as $\chi^2/Sd= 1.86$, RMSEA= .05, NFI= .94, CFI=.97, GFI= .95, IFI= .97, SRMR= .46.

Analysis of Data

While performing the analysis, SPSS 22 program was used for descriptive statistics and AMOS 20 program was used for structural equation modeling. One of the most important advantages of structural equation modeling is that it allows observable and unobservable variables to be defined with a relational and causal model (Tabacnick & Fidell, 2001).

RESULTS

In this section, firstly, the findings related to descriptive statistics are given. Arithmetic mean(\bar{X}), standard deviation (sd), skewness coefficient and kurtosis coefficient values of the data.

Table 2 Descriptive statistics of data

Variables	n	\bar{X}	sd.	Skewness	Kurtosis
Autonomy	688	29.40	5.72	-.87	.24
Competence	688	29.52	5.89	-.87	.19
Relatedness	688	45.13	8.75	-1.08	.69
Self-monitoring	688	26.70	3.57	-1.15	.91
Self-evaluation	688	22.26	2.92	-1.19	1.21
Self-empowerment	688	21.63	3.39	-.89	.18
Not being able to access information	688	9.95	4.52	.95	.25
Losing connectedness	688	16.23	6.45	.36	-.42
Not being able to communicate	688	15.51	6.94	.78	.07
Giving up convenience	688	13.02	5.89	.87	.53

There are multiple methods of examining whether the data set has a normal distribution. In the present study, the normal distribution was determined by the skewness and kurtosis coefficients. The skewness and kurtosis coefficients between +2 and -2 indicate that the data are normally distributed.

As a result of the analysis conducted to determine the general nomophobia levels of university students, it was determined that 0.4% of the students did not have a nomophobic tendency. It was observed that 65.7% of the students had mild nomophobia, 30.8% had moderate nomophobia and 3.1% had severe nomophobia.

Results on the Measurement Model

According to Baron and Kenny (1986), among the observed variables, the measurement model related to the research model was tested by using the variables satisfying the necessary condition (Figure 1). Before this process was performed, in the case of measuring latent variables with observed variables in structural equation models, the item parcellation method was applied to reduce the number of observed variables in the model and increase reliability (Bandalos, 2008). It was included in the analysis as three dimensions (the dimension of losing connectedness was omitted) for the nomophobia scale with plotting. The goodness-of-fit values of the measurement model are presented in Table 3.

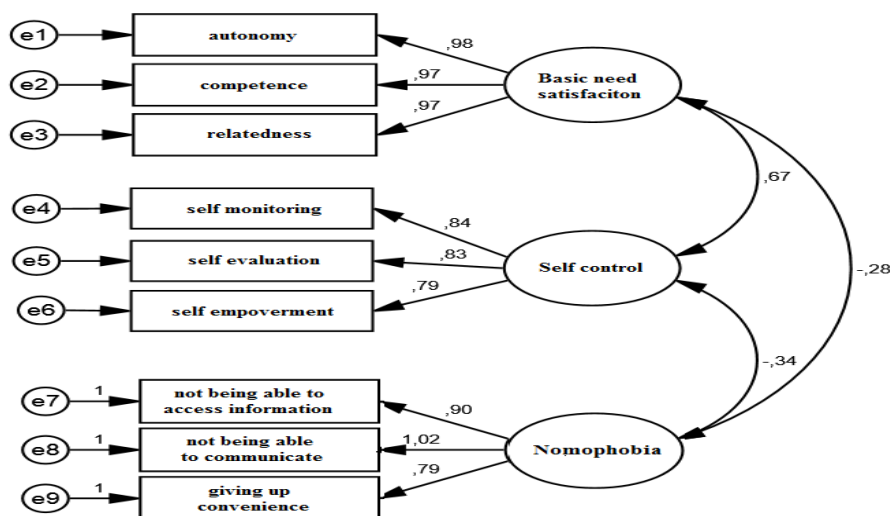


Figure 1. Measurement pattern for the tested model

Table 3 Goodness-of-fit values for the measurement model

Measurement	Good fit	Acceptable Fit	Values	Comment
χ^2/sd	≤ 3	$\leq 4-5$	3.007	Acceptable fit
RMSEA	≤ 0.05	0.06-0.08	.03	Good fit
SRMR	≤ 0.05	0.06-0.08	.06	Acceptable fit
GFI	≥ 0.90	0.89-0.85	.97	Good fit
NFI	≥ 0.95	0.94-0.90	.98	Good fit
CFI	≥ 0.97	≥ 0.95	.99	Good fit
AGFI	≥ 0.90	0.89-0.85	.96	Good fit
TLI	≥ 0.95	0.94-0.90	.98	Good fit

N= 688

When the results given in Table 3 are examined that the goodness of fit values of the measurement model are at a good level, in other words, the model fits well ($\chi^2/sd= 3.007$, $p < .001$, $RMSEA = .05$, $SRMR = .06$, $GFI = .97$, $AGFI = .96$, $TLI = .98$, $CFI = .99$). After the verification of the measurement model, the structural model was tested.

Table 4 shows that the measurement model has sufficient fit values to test the structural model. Structural equation modeling incorporates a structural model and a measurement model.

Table 4 Correlation values between observed variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Autonomy	1								
(2) Competence	.85**	1							
(3) Relatedness	.85**	.84**	1						
(4) Self-monitoring	.55**	.56**	.57**	1					
(5) Self-evaluation	.52**	.50**	.53**	.70**	1				
(6) Self empowerment	.52**	.53**	.51**	.65**	.68**	1			
(7) Not being able to access information	-.31**	-.30**	-.30**	-.37**	-.27**	-.25**	1		
(8) Not being able to communicate	-.29**	-.29**	-.28**	-.35**	-.27**	-.25**	.82**	1	
(9) Giving up convenience	-.23**	-.23**	-.22**	-.27**	-.20**	-.19**	.71**	.81**	1

* $p < .05$, ** $p < .01$

As a result of the analysis, the significant relationships between the variables (Table 4) show that the model is suitable for the test. According to the structural equation model analysis results applied for the mediation effect of self-control ($\chi^2/sd= 3.007$, $p < .001$, $RMSEA = .05$, $SRMR = .06$, $GFI = .98$, $AGFI = .96$, $IFI = .99$, $CFI = .99$), it is seen that the obtained data have acceptable or good fit values. The structural model for the analysis is presented in Figure 2 and Figure 3. As a result of the analysis, it was determined that basic psychological need satisfaction predicted self-control positively ($\beta = .67$, $p < .01$), while self-control predicted nomophobia negatively ($\beta = -.28$, $p < .01$). With the inclusion of the self-control variable as a mediator variable in the model, the predictive power of basic psychological need satisfaction ($\beta = -.09$, $p > .05$) of nomophobia lost its significance. In other words, basic psychological need satisfaction predicts nomophobia on self-control significantly ($\beta = -.19$, $p < .01$).

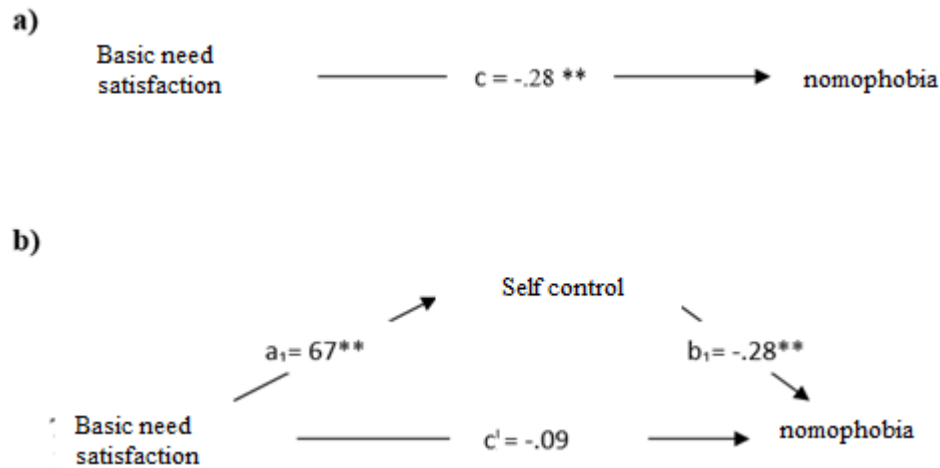


Figure 2. Indirect effect of self-control on the relationship between basic psychological need satisfaction and nomophobia (figure a, b)

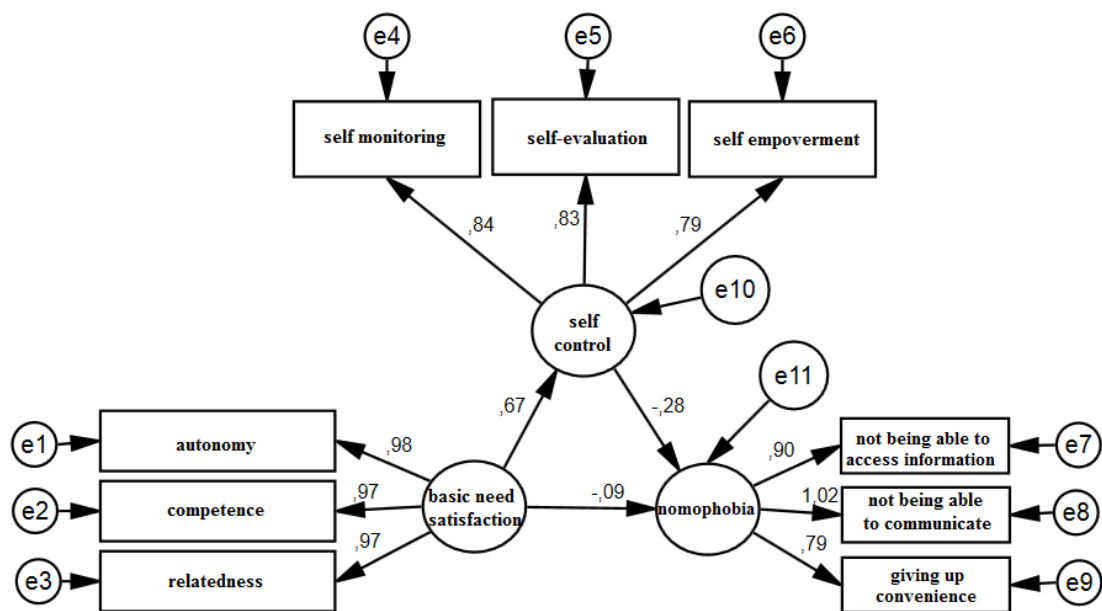


Figure 3. Standardized analysis values related to the structural model

Bootstrapping Process

The significance of the direct and indirect effects of the variables in the structural model was determined by Bootstrap analysis. For the number of repeated sampling in the literature, the number of 2000 suggested by Arbuckle (2007) was entered. The coefficients of the direct and indirect paths that emerged as a result of the Bootstrap analysis and the average effects at the 95% confidence intervals for these coefficients are presented in Table 5. Accordingly, it can be stated that all direct path coefficients are significant. It is seen that the indirect path coefficient, which allows the intermediary role to be understood, is also found to be significant ($\beta = -.19, p < .01$). According to the results obtained, it can be said that self-control plays the role of a full mediator in the relationship between basic psychological need satisfaction and nomophobia.

Table 5 Results of bootstrap analysis examining the direct and indirect effects of the structural equation model

Model Paths	95% CI		
	Coefficient	Lower	Upper
Direct Effect			
Need Satisfaction → Self-control	.67**	.59	.72
Self-control → Nomophobia	-.28**	-.38	-.16
Need satisfaction → Nomophobia	-.28**	-.36	-.21
Indirect Effect			
Need Satisfaction → Self-control → Nomophobia	-.19**	-.26	-.11

**p<.01

DISCUSSION

In the present study, the nomophobia levels of university students were determined. Accordingly, it was determined that 0.4% of the students did not have nomophobia, 65.7% had mild nomophobia, 30.8% had moderate nomophobia, and 3.1% had extreme nomophobia. In some other international studies in the literature; for example, 6.1% of the participants in the study of Sethia et al. (2018), 13.5% of the participants in the study of Harish and Bharath (2018), and 3% of the participants in the study of Davie and Hilber (2017) were found to be extremely nomophobic.

According to the findings obtained as a result of the research, it was determined that basic psychological need satisfaction are directly related to nomophobia. It was determined that the dimensions of nomophobia were negatively related to not being able to access information, not being able to communicate and giving up convenience, and the dimensions of basic psychological needs such as autonomy, competence and relatedness. Canoğulları and Güçray (2017) examined the relationship between smartphone addiction levels and psychological needs. It was concluded that individuals with low addiction have high need for autonomy, competence and relatedness. In other words, it is thought that the level of meeting basic psychological needs should be considered to reduce the nomophobia levels of individuals.

According to the findings of the research, it was seen that basic psychological needs are directly related to self-control. In the study conducted by Orkibi and Ronen (2017), it was determined that individuals with high self-control skills have high basic psychological needs satisfaction. Fujita (2008) stated that self-control will be effective on which of the needs felt by the individual, and the need that the individual feels more determines. Considering that self-control is explained as the individual's ability to determine the responsibility and control of his/her behaviors based on this information, it is thought that it is understandable that there is a positive relationship between the individual's need and self-control.

According to the findings obtained as a result of the research, it was determined that there were negative significant relationships between the self-control variable and each dimension of self-monitoring, self-evaluation and self-empowerment, and each dimension of nomophobia and nomophobia, not being able to access information, not being able to communicate and giving up convenience. In the literature, Çiçek (2020) found that self-control is effective on nomophobia, and people with high self-control have lower levels of nomophobia than those with low self-control. In addition, self-control means that the individual can not only control his behavior but also adjust it according to the environment and living conditions of the individual (Yıldırım, 2014). It is seen that the findings obtained in some other domestic and international studies are similar to the results obtained in the current study (Cudo et al., 2019; Kuzucu et al., 2015; Mazılı, 2020; Yakut, 2019).

In the model proposed within the scope of the research, it was confirmed that the mediating effect of self-control, basic psychological needs and nomophobia variables was statistically significant. This information was also supported by the study conducted by Kim et al. (2018), and it was revealed that there was an increase in the nomophobic tendencies of the students as the self-

control levels of the students decreased. A similar study was conducted by Markowitz et al. (2019), and in this study, it was determined that those who use smartphones for longer periods have a low level of self-control and have difficulty in taking responsibility for their actions. Therefore, these results suggest that there is a strong relationship between self-control and nomophobia.

In the present study, it is a very valuable finding that the mediating effect of self-control between the satisfaction of basic psychological needs and nomophobia is determined. According to these criteria of nomophobia, it can be said that self-control is effective on nomophobia. It is known that in all types of addiction, the individual's loss of control over their substance use behaviors is an important feature used in the definition of addiction. For this reason, the level of self-control is effective in the emergence of nomophobic behavior. It has been revealed as a result of a study that low self-control is effective in increasing the nomophobic tendency (Çiçek, 2020).

In the studies conducted in the literature, it is seen that the relationship of nomophobia with different samples and different variables is discussed. In addition, it is seen that determining the mediating effect in the relationship between nomophobia and different variables is important in terms of measures that can be taken against nomophobia. However, it has been found that different results have been obtained in studies conducted. While it was determined that there were significant relationships in any study conducted with the same variables, it was determined that there was no significant relationship in a study conducted with a different sample using the same variables. Therefore, the different results in these studies show that nomophobia is still not fully explained. Obtaining such results in studies does not constitute a disadvantage for studies. On the contrary, such results are thought to be important in terms of showing the need for more research on nomophobia.

Conclusion and Recommendations

The findings obtained from the research can be summarized as follows: One of the findings obtained in the current study is the confirmation that "basic psychological needs satisfaction of university students is directly related to nomophobia". Another finding obtained in the study was that "the basic psychological needs satisfaction of university students is directly related to self-control". Another finding that was discussed and confirmed in the study is that "the self-control levels of university students are directly related to nomophobia". Finally, it was seen that "self-control plays a mediating role in the relationship between basic psychological needs and nomophobia in university students", which is the main purpose of the research.

The findings obtained as a result of scientific research and the suggestions developed by the author of the research to shed light on future studies in the literature in line with these findings are as follows:

* The current research was conducted in a university sample. It can be tested whether the model tested within the scope of the research is confirmed by an experimental study.

* The current research was conducted in a cross-sectional fashion with the variables of basic psychological needs, self-control and nomophobia. The consistency of the model in the current research can be tested with longitudinal studies.

* Psychological counseling and application centers of universities can provide counseling services for students who have difficulties in these issues in terms of gaining students' self-control and self-control awareness.

Although the current research has contributions to the field, it also has some limitations. The data obtained as a result of the research is limited to the answers given by the participants to the measurement tools and the qualities that the measurement tools measure. The data obtained from the research is limited to the students studying at Dokuz Eylül University and Pamukkale University in the 2019-2020 academic year.

Conflicts of Interest:

No potential conflict of interest was declared by the authors.

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Since the article is an article produced from a doctoral thesis, both authors contributed equally to each part of the article.

Author 1 and Author 2 : Conceptualization and Methodology.

Author 1 and Author 2 : Writing- Original draft preparation.

Author 1 and Author 2 : Visualization, Investigation.

Author 1 and Author 2 : Validation.

Author 1 and Author 2 : Writing- Reviewing and Editing.

Author 2 : Supervision.

Ethical Statement:

Ethics committee approval was received for this study from the Scientific Research Ethics Committee, the registration number 09, date of 22/10/2019.

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