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Predictors of Smartphone Addiction in Teacher Candidates: Self-Control and Communication Skills

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Abstract. In this study, the predictive role of self-control and communication skills on smartphone addiction levels of teacher candidates was examined. The research was conducted based on the relational survey model. The research group consisted of 378 teacher candidates, 181 (45.9%) males and 197 (54.1%) females. The age range of the research group is between 18-29 and the average age is 21.96. "Smartphone Addiction Scale-Short Version", "Brief Self-Control Scale", "Communication Skills Scale" and "Personal Information Form" were used as data collection tools. The data obtained in the study were analyzed by the multiple linear regression analysis (stepwise) method. As a result of the research, it was determined that the variables of self-control and communication skills significantly predicted smartphone addiction.

Keywords. Teacher candidates, smartphone addiction, self-control, communication skills.

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As a result of global developments in information, communication and internet opportunities, smart phones have become one of the indispensable parts of life. Smartphones offer many conveniences to individuals such as communication, entertainment, digital camera, information and document sharing, education, easy access to the internet and touch operation. This situation seriously affects the lives of individuals and causes them to use smart phones problematically. Smartphone addiction draws attention as one of these negative effects (Panova & Carbonell, 2018; Sağar, 2022a, 2022b; Kwon et al., 2013a; Kwon et al., 2013b).

Smartphone addiction, which is described as one of the generalized internet addictions (Chen et al., 2020), is defined as people encountering problems in their daily life activities due to excessive and problematic smartphone use (Kwon et al., 2013a; Kwon et al., 2013b). In other words, the inability to regulate the use of a smartphone causes negative consequences and clinical deterioration in daily life (Billieux, 2012). Although it is described as behavioral addiction by some researchers (Haug vd., 2015; Kwon vd., 2013b) and problematic smartphone use by some researchers (Panova & Carbonell, 2018), it is seen that there is no diagnosis of smartphone addiction in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) yet. Although a diagnosis of smartphone addiction is not made in this book, a diagnosis of "game disorder on the Internet" is included (APA, 2013). This diagnosis is considered as a positive step on the subject of smartphone addiction and research to be carried out in this field (Sağar, 2022a, 2022b). Although there is no diagnostic and diagnostic criteria in DSM-V yet, diagnostic criteria are recommended by some important researchers regarding smartphone addiction. These criteria are a) being busy with smartphone use throughout the day, b) developing tolerance in the tendency to use the smartphone more with the increase in smartphone use, c) being aware of the harmful effects that may occur due to excessive use of the smartphone and not limiting the use of smartphones, d) smartphone use. feeling anxious and restless when not in use, wanting to use the smart phone severely, e) experiencing smart phone deprivation, f) feeling the need to check the smart phone by waking up repeatedly during sleep, g) tending to sleep with the phone (Alosaimi et al., 2016; Kwon et al., 2013a; Lanaj et al., 2014). In this context, smartphone addiction can be expressed as a problem that leads to loss of control and control of the person and loss of functionality in personal, social and other vital areas of activity due to unhealthy smartphone use (Sağar, 2022a, 2022b).

Smartphones with users of all ages are widely used, especially among young population and university students (Boumosleh & Jaalouk, 2018; Roberts et al., 2014). In addition to communication, smart phones have many different features such as fast message transmission, fast access to the

internet and social media, having multimedia players, playing games, having electronic books and photo albums, and using cameras (Ting & Chen, 2020). When the literature is examined, findings proving that smartphone addiction is related to different issues such as stress, anxiety, depression, loneliness, subjective well-being, psychological well-being, life satisfaction, happiness have been found (Choi & Kim, 2018; Hawi & Samaha, 2017; Kim et al., 2019; Kim & Choi, 2017; Kwon & Paek, 2016; Mahapatra, 2019; Tangmunkongvorakul et al., 2019; Wu et al., 2020). Considering the variables examined in the current studies in the literature, it is thought that the variables of self-control and communication skills in this study will offer a different alternative perspective to other studies. For these reasons, in this study, the relationships between self-control and communication skills variables and smartphone addiction and how these variables predict smartphone addiction were examined.

The first of the variables examined as a predictor of smartphone addiction in this study is self-control. Self-control, which is described as an effort to control oneself, is expressed as a central function of the self and an important key to success in life (Baumeister et al., 2007). Self-control is defined as successful overriding of one's impulses (Baumeister et al., 1998). It is also described as making one's reactions conform to certain standards such as moral values and social expectations (Baumeister et al., 2007). It is the ability of people to delay their instant gratification, not act impulsively, and regulate their physical and emotional reactions (Rosenbaum, 1980). It is also the ability to direct one's own behavior towards more appropriate ways (Baumeister et al., 1994). According to Rosenbaum (1980), there are four dimensions for a person to develop self-control. These dimensions are a) using one's own instructions to control physiological and emotional reactions, b) applying strategies for problem solving, c) the ability to delay instant gratification to achieve high-level goals, and d) perceived self-efficacy. Self-control, the ability to exercise control over the self, is critical to central human behavior in achieving one's goals, successfully fulfilling one's duties, and in the overall organization of one's life (Baumeister et al., 1998). In general terms, self-control refers to the ability to suppress or change one's internal impulses and to avoid undesirable behavioral tendencies and avoid doing those (Tangney et al., 2004). In this context, self-control can be expressed as self-control and discipline against one's desired impulses (Sağar, 2021a, 2021b). Otherwise, low self-control leads to many behavioral problems, including severe antisocial behavior (Baumeister & Heatherton, 1996). In this context, when the subject is evaluated within the scope of the research, it can be said that teacher candidates who cannot regulate themselves by controlling their instant impulses can limit other life areas by focusing on a single life area such as smartphone

addiction, cannot regulate themselves, and therefore exhibit some problematic behaviors. Therefore, it is thought that smartphone addiction may be related to the self-control variable

Another variable that is thought to be related to the smartphone addiction variable in this study is communication skills. Communication refers to the ability to interact in a quality manner using verbal and nonverbal methods or the process of exchange of meaning between the informant and the person receiving the information (Chen & Starosta, 1996; Seiler & Beall, 2005). Stewart et al. (2005) emphasize that the quality of communication is directly related to the quality of life. At this point, communication skills are of great importance in terms of a quality life and healthy communication. Communication skills are some of the skills that can be learned and taught, such as being understood, understanding, respecting, and conveying emotions and thoughts correctly. (Egan, 1994; Johnson, 1996; Verdener, 1999). In general terms, communication skills that enable a healthier communication are the ability to listen and react effectively (Egan, 1994). Considering the time period in which communication skills are important for a quality life, smart phones, one of the modern communication tools of the age, have many communication features and besides making phone calls to their users, information, entertainment, taking photos and videos, meeting, messaging, entering social networks. It offers many features such as sharing and surfing the internet (Haug et al., 2015; Kwon et al., 2013a; Kwon et al., 2013b; Sağar, 2022a, 2022b). In this way, smart phones provide active communication to their users through communication applications (such as social networks). As a matter of fact, people who have communication problems have difficulty talking to other people, causing problems in establishing personal relationships in the real world and a desire to seek alternatives. This situation leads to a decrease in the communication skills of the person, a qualitative change in the personal relationships of the person, and together with the anonymity feature in the virtual world, it can cause smartphone addiction (Sok et al., 2019). When the subject is evaluated within the scope of the research, it can be said that teacher candidates who cannot regulate their responsibilities and human relations by being caught up in the communicative and other features of smartphones may face a problem such as smartphone addiction. Therefore, it is thought that smartphone addiction may be related to the variable of communication skills.

Smartphones, which spread globally and have users of all age levels, can threaten the mental health of individuals by causing loss of function in different areas. In terms of teacher candidates, smartphone addiction can be considered as an important problem that needs to be emphasized. For this reason, it is thought that revealing the variables that may be related to smartphone addiction in teacher candidates will contribute to a better understanding of this problem and to preventive and

curative mental health studies to be carried out in this context. In the literature review conducted on smartphone addiction, it has been determined that there are studies that examine smartphone addiction with different variables. In addition to and alternatively to these studies, the research conducted in terms of examining the smartphone addiction variable with the variables of self-control and communication skills is considered important and valuable for the field. In this context, the aim of the study was to examine how self-control and communication skills variables predicted the smartphone addiction levels of teacher candidates. In the research conducted for this purpose, do the variables of self-control and communication skills significantly predict the smartphone addiction levels of teacher candidates? The answer to the question has been sought.

Method

Research Model

The research was conducted based on the relational screening model. The relational screening model is a research model for determining the existence or degree of co-variance between two or more variables (Karasar, 2016).

Study Group

The research group of this study consisted of a total of 378 teacher candidates, 181 (45.9%) male and 197 (54.1%) female, studying at different universities in Turkey in the 2021-2022 academic year. The age range of the research group is between 18-29 and the average age is 21.96.

Data Collection Tools

Smartphone addiction scale- short version. The Turkish adaptation of this scale developed by Kwon et al. (2013), was made by Noyan et al. (2015). This scale aims to determine the smartphone addiction levels of individuals. It is in 5-point Likert type and consists of 10 items in total. The points that can be taken from the scale are 10-60. The internal consistency of the scale was calculated as .86. In this study, the internal consistency of the total scores of the scale was determined as .91 and the McDonald's Omega (ω) reliability coefficient value was determined as .91.

Brief self-control scale. The Turkish adaptation of this scale developed by Tangney et al. (2004) was made by Nebioglu et al. (2012). This scale aims to determine the self-control levels of individuals. It is in 5-point Likert type and consists of a total of 13 items. The scores that can be obtained from the scale are 13-65. The internal consistency of the scale was calculated as .83.

(Nebioglu et al. 2012). In this study, the internal consistency of the total scores of the scale was determined as .69 and the McDonald's Omega (ω) reliability coefficient value was determined as .69.

Communication skills scale. It was developed by Korkut-Owen and Bugay (2014). This scale aims to determine the communication skills levels of individuals. It is in 5-point Likert type and consists of 25 items in total. The points that can be taken from the scale are 25-125. The internal consistency of the scale was calculated as .89. (Korkut-Owen & Bugay, 2014). In this study, the internal consistency of the total scores of the scale was determined as .92 and the McDonald's Omega (ω) reliability coefficient value was determined as .92.

Personal information form. The personal information form was created in order to learn the gender and age information of the research group.

Data Collection

Research data was collected via Google Form online method. In this direction, data collection tools prepared via Google Form were sent via e-mail and teacher candidates were invited to the research. Participation of volunteers in the study was based on, and informed consent was obtained from the individuals before participating in the study. In addition, the confidentiality principle was taken into account during the data collection process and individuals were informed about this issue. The online data collection process took fifteen days.

Data Analysis

In the study, firstly, the normality and linearity of the data sets were evaluated to determine whether the data were suitable for multiple linear regression analysis. The presence of extreme values that make the normality (multivariate) and linearity assumptions difficult was examined according to mahalanobis distance (16.27), cook's (Cook'<1) and leverage values (.000 - .020). In addition, the data sets were examined in terms of kurtosis, skewness values (+1/-1), scatter and histogram graphics. In addition to meeting the linearity and normality conditions of the data sets, the sample size was also found to be appropriate based on the number of predicting variables. Another assumption of the multiple linear regression analysis was the absence of a high correlation coefficient between the predictor variables, and it was observed that there was no correlation value above .80, which can be defined as multicollinearity between the predictor variables (Table 2). It was determined that tolerance values were higher than .20, VIF values were less than 10 and CI values were less than 30. The Durbin-Watson value was examined to examine the condition of the errors being independent, and it was seen that the value was between 1 and 3 (DW = 1.89) and it was not a problem. It was

determined that the data obtained depending on the examinations were suitable for multiple linear regression analysis. The data obtained in the study were analyzed with the multiple linear regression analysis (stepwise) method. The significance level of .05 was used in the study (Akbulut, 2010; Büyüköztürk, 2011).

Ethics

Ethics committee approval was received from Afyon Kocatepe University Social and Human Sciences Scientific Research and Publication Ethics Committee for the research (Decision Date: 30.09.2022, Meeting: 09, Number of Documents: 129420).

Results

In this part of the study, first the arithmetic mean and standard deviation values of the variables, then the simple correlation analysis coefficients and finally the multiple linear regression analysis (stepwise) results are given. The arithmetic mean and standard deviation values are given in Table 1.

Table 1.

Arithmetic Mean and Standard Deviation Values

	N	$\bar{X}$	**SS**
Smartphone Addiction (S.A.)	378	31.57	13.94
Self-Control (S.-C.)	378	54.33	45.53
Communication Skills (C.S.)	378	98.04	12.43

When Table 1 is examined, the arithmetic mean and standard deviation values of the research group were determined as smartphone addiction ($\bar{X}$ = 31.57; *SS* = 13.94), self-control ($\bar{X}$ = 54.33; *SS* = 45.53) and communication skills ($\bar{X}$ = 98.04; *SS* = 12.43). The relationships between smartphone addiction, self-control, and communication skills were examined using a simple correlation analysis method and the results are given in Table 2.

Table 2.

Simple Correlation Analysis Coefficients for Variables

	S. A	S.-C.	C.S.
Smartphone Addiction (S.A.)	-		
Self-Control (S.-C.)	-.405**	-	
Communication Skills (C.S.)	-.318**	.214	-

**p<.01

When Table 2 is examined, it has been determined that there is a significant negative relationship between smartphone addiction and self-control (r = -.405, p < .01), and a negative

significant relationship between smartphone addiction and communication skills (r = -.318, p < .01). In addition, when Table 2 is examined, it is seen that there is no correlation value above .80, which can be defined as multicollinearity among the predictive variables. Then, stepwise multiple regression analysis values were examined to reveal the predictive power of self-control and communication skills variables on smartphone addiction, and the results are given in Table 3.

According to the ANOVA table examined in the next step, it was determined that the explained variance or regression model was statistically significant ($F_{1/376}$ = 73.93; $F_{2/375}$ = 52.97; p < .01). In this context, it can be said that the predictor variables successfully performed the prediction process on the model.

Table 3.

Multiple Linear Regression Analysis (Stepwise) Results on Predicting Smartphone Addiction

Model		**UC**	**SC**							
	B	***Std. Error***	***Beta***	***t***	***Zero-Order***	***Partial***	***R***	***R^2***	***F***	***Sd***
1. (C.)	38.323	1.02		37.47**						
S.-C.	-.124	.014	-.405	-8.59**	-.405	-.405	.405[a]	.164	73.93**	1/376
1. (C.)	64.087	5.06		12.65**						
S.-C.	-.108	.014	-.353	-7.57**	-.405	.364	.469[b]	.220	52.97**	2/375
C.S.	-.272	.052	-.242	-5.18**	-.318	-.259				

Not: **p<.01, S.-C.: Self-Control, C.S.: Communication Skills, (C.): Constant

According to Table 3, self-control and communication skills variables were included in the multiple linear regression analysis (stepwise) process, as they significantly predicted smartphone addiction. According to beta and correlation (binary/partial) values, there is a significant negative correlation between the smartphone addiction variable and the variables of self-control and communication skills. Self-control and communication skills variables together explain approximately 22% (R = .469; R^2 = .220, p < .01; $F_{2/375}$ = 52.97; p < .01) of the total variance regarding smartphone addiction.

In the first step of the multiple linear regression analysis (stepwise), it was determined that the beta coefficient of the self-control variable in predicting smartphone addiction was -.405, and the *t*-test result of the significance of the beta coefficient was also found to be at a significant level

(t = -8.59, p < .01). The self-control variable alone explains approximately 16% of smartphone addiction (R = .405; R^2 = .164; $F_{1/376}$ = *73.93*; p < .01).

In the second step of the multiple linear regression analysis, besides the self-control variable, the communication skills variable was also included in the model. Self-control and communication skills variables together explain approximately 22% of smartphone addiction (R = .469; R^2 = .220, p < .01; $F_{2/375}$ = 52.97; p < .01). The beta coefficient of the self-control variable was -.353; The beta coefficient of the communication skills variable was found to be -.242. In addition, it was determined that the t test results of the significance of the beta coefficient were also at a significant level (t_{SC} = -7.57, p < .01 / t_{CS} = -5.18, p < .01).

As a result of the multiple linear regression analysis (stepwise), it was seen that the variables of self-control and communication skills significantly predicted smartphone addiction. Considering the beta values of the variables in the model, it was determined that "self-control" in the first place and "communication skills" in the second place significantly predicted smartphone addiction.

Discussion and Conclusion

In this study, the predictive role of self-control and communication skills on smartphone addiction levels of teacher candidates was examined. According to the results of the research, it was determined that there was a significant negative correlation between the smartphone addiction variable, self-control and communication skills variables. In addition, as a result of this study, it was seen that the variables of self-control and communication skills were significant predictors of the smartphone addiction variable. Self-control and communication skills variables together explain approximately 22% of the total variance regarding smartphone addiction. It was determined that "self-control" and "communication skills" variables predicted smartphone addiction significantly, respectively.

As a result, it was determined that the self-control variable significantly predicted the smartphone addiction of teacher candidates and there was a significant negative correlation between them. In other words, it can be said that as the self-control level of teacher candidates increases, the level of smartphone addiction decreases. In this case, it can be said that teacher candidates with high self-control levels experience less smartphone addiction problems. In line with this result, when the literature was examined, it was seen that the results of the research conducted by Cho et al. (2017), Geng et al. (2021), Ju et al. (2019), Kim et al. (2016), Lee and Park (2014), Sok et al. (2019) supported the results of this research that as the level of self-control increases, the level of smartphone addiction

decreases. Self-control is characterized as consciously suppressing one's unwanted actions, consciously following one's own action, and automatically restricting one's actions (Muraven & Baumeister, 2000). The fact that the person has a high level of self-control shows that he is in an effort to control himself, he can successfully invalidate his impulses, he can make his behavior comply with some standards such as moral values and social expectations, he is not behaving impulsively, and he can regulate his physical and emotional reactions (Baumeister et al., 1998; Baumeister et al., 1994; Baumeister et al., 2007). In this context, a person's high self-control may help him/her reduce his/her smartphone addiction. As a matter of fact, Heo and Lee (2018) emphasize that in order to manage smartphone addiction, it is necessary to encourage healthy use of smartphones and strengthen self-control. In addition, Lee and Park (2014) draw attention to the importance of developing self-control programs in individuals instead of making strict restrictions on smartphone use. When the current results in the literature and the result of this study are evaluated as a whole, it can be said that individuals who can provide self-control, which expresses self-control by self-regulation, can reduce smartphone addiction. In this context, it is thought that a high level of self-control has an important function in reducing the level of smartphone addiction of teacher candidates. In summary, it is expected that increasing self-control in teacher candidates can help reduce smartphone addiction.

According to another result reached in this study conducted with teacher candidates, it was determined that the variable of communication skills significantly predicted the smartphone addiction of teacher candidates and there was a significant negative correlation between them. In other words, as the level of communication skills of teacher candidates increases, the level of smartphone addiction decreases. In this case, it can be said that teacher candidates with high communication skills experience less smartphone addiction problems. In the context of this result, when the literature is examined, it is seen that the results of this research support the results of the studies conducted by Ayar and Gürkan (2022), Cerit et al. (2018), Kim et al. (2017); Khasanah and Daulay (2022), as the level of communication skills increases, the level of smartphone addiction decreases. Communication skills refer to all the skills that can be learned and taught in terms of both understanding and understanding verbal and non-verbal methods and realizing a healthy interaction (Chen & Starosta, 1996; Egan, 1994; Johnson, 1996; Seiler & Beall, 2005; Verdener, 1999). Having high communication skills can help reduce smartphone addiction. As a matter of fact, Kim et al. (2017) draw attention to the importance of communication skills in order to reduce smartphone addiction and regulate smartphone use. When the results of the studies in the literature and the result obtained

from this study are evaluated as a whole, it can be said that individuals who can establish and maintain healthy relationships by using their communication skills can reduce their smartphone addiction. In this context, it is thought that high-level communication skills are important in reducing the level of smartphone addiction of teacher candidates. In summary, it is expected that increasing the communication skills of teacher candidates can help reduce smartphone addiction.

Recommendations

This research revealed an important result regarding the self-control and communication skills variables being related to and predicting smartphone addiction. In addition, the research has some limitations. These limitations are some limitations such as having only teacher candidates in the research group, examining only the variables of smartphone addiction and self-control and communication skills, and conducting the research with quantitative data. In this direction, a similar study can be conducted on different research (primary and secondary school students, adolescents, university students, candidates for different professions, etc.) groups other than teacher candidates. In this study, smartphone addiction and only self-control and communication skills variables were examined, and other related psychological factors were not examined. In other studies to be conducted, the predictor of other variables on smartphone addiction can be examined. This study is a cross-sectional study. Therefore, this research does not reveal the cause-effect relationships between smartphone addiction and self-control and communication skills. In other studies, the cause-effect relationships between smartphone addiction and self-control and communication skills can be examined more comprehensively by using experimental methods. With this study, it was tried to both confirm the previous findings related to smartphone addiction studies and to reach original data about the prediction of smartphone addiction by self-control and communication skills. In this context, interventions aimed at increasing the level of self-control and communication skills of teacher candidates in their efforts to increase smartphone addiction can also be tried on smartphone addiction. Intervention programs and counseling activities can be prepared and practiced so that teacher candidates acquire variables that can help reduce the factors that may cause problems in their personal, social, academic and professional development, such as smartphone addiction, and accordingly can regulate themselves. On this subject, studies can be carried out to reduce the smartphone addiction of teacher candidates and to regulate their use of smartphones through group studies, seminars and training programs.

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Conflict of Interest

It has been reported by the authors that there is no conflict of interest.

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Ethical Standards

The authors have carried out the research within the framework of the Helsinki Declaration

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