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ORIGINAL ARTICLE

Gender, Self-regulation, Academic Procrastination, and Smartphone Checking Frequency During Study Hours in Predicting Turkish Adolescents' Smartphone Addiction

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Main Points

- Self-regulation skill in adolescents is one of the important elements in combating smartphone addiction.
- Females are at higher risk than males in terms of smartphone addiction.
- Academic procrastination and the habit of checking one's smartphone while studying contribute to the development of smartphone addiction among adolescents.

Abstract

The aim of this study was to examine the relationship between high school students' smartphone addiction levels and their (a) gender, (b) self-regulation, (c) academic procrastination, and (d) the frequency of checking their smartphones during study hours. The study group consisted of 514 high school students attending private and public schools in Turkey. Pearson's correlation coefficient and stepwise multiple regression were the statistical methods used in the study, which was based on a predictive correlational design. The findings of the study indicate that there is a statistically significant, moderate level of positive correlation between smartphone addiction and the lack of self-regulation, the tendency toward academic procrastination, and the frequency of checking one's smartphone during study hours. A significant weak-level negative correlation was found between smartphone addiction and successful self-regulation. In addition, the predictors of high school students' smartphone addiction were determined to be (a) gender, (b) self-regulatory failure, (c) academic procrastination, and (d) frequency of checking smartphone during study hours. Finally, it was determined that the strongest predictor of high school students' smartphone addiction was self-regulatory failure. The findings of the study have been discussed alongside the findings stated in the current literature, and suggestions have been presented.

Keywords: Academic procrastination, adolescents, self-regulation, smartphone addiction, technology addiction

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Introduction

The current rapid developments in both hardware and software domains of information technology make the daily lives of individuals easier. Many tedious tasks, such as banking and shopping, or scheduling hospital appointments, are now carried out easily at the mere click of a button, using mobile devices. In addition to the traditional features of cellular phones (calls, SMS, etc.), smartphones and their associated mobile applications have especially become an indispensable tool in the lives of individuals, helping them perform daily operations on the internet such as browsing social network sites, playing digital games, tracking friends and their activities, communicating, and instant messaging

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(Hawi & Samaha, 2016). Globally, more than 5.19 billion people use mobile phones, and this number is increasing every year. In parallel, 77% of the population of Turkey today use smartphones and the number of mobile users is still increasing day by day (We are social, 2020; MOBISAD, 2020). Especially among adolescents and university students who make up nearly one-fifth of Turkey's population (TUIK, 2019), smartphone use seems to be widespread, most prominently attributed to the immense popularity of social media (Lopez-Fernandez et al., 2017). Alongside the convenience, mobility, and other functionalities that smartphones offer, the intense and problematic use of smartphones also brings with it many problems that have negative psychological, social, and health-related effects, such as smartphone addiction (Bian & Leung, 2015; Choi et al., 2015; Chóliz, 2012). The symptoms of smartphone addiction include the individual's inability to control his occupation and desires over time due to the purposes of use, the usage habits, and excessive use (Bian & Leung, 2015). The smartphone habits of individuals who use their smartphones extensively for socialization develop faster, and can lead to addictive smartphone behavior (van Deursen et al., 2015). In addition, it is thought that the effect of personal characteristics such as a low capacity for self-regulation (Yun et al., 2016) – – thought to have an effect on the problematic behavior pertaining to use of the internet, social media, and digital games, eventually leading to addiction – – contribute to the intensive use of smartphones. It has also been shown in various studies that an individual's gender may predict smartphone addiction (Beranuy et al., 2009; Chen et al., 2017b; Salehan & Negahban, 2013). Considering these factors, it is proposed that while investigating smartphone usage habits and motivation, variables such as self-regulation and gender may be worthy of evaluation, especially among adolescents.

Smartphone Addiction

A habit is a form of behavior that occurs without passing through the filter of consciousness (La Rose & Eastin, 2004). Our habits are formed as a result of cyclical behaviors. An advanced stage of a habit may also point to addiction. It is imperative to keep in mind that people do not arrive at the state of addiction instantly, and that this process progresses gradually. The process of using information technology products begins with experimental use and then continues with social use. The next stage is the use for specific purposes, and this may finally extend into the so-called dependent use (Yesilay, 2018). In this respect, when the use of smartphones and mobile applications has turned into a cycle, it leads to a habit. However, excessive usage habits may lead individuals to behavioral problems and addiction (Oulasvirta et al., 2012). Smartphone addiction is defined in the literature as a non-pathological behavioral addiction, seen as excessive or problematic smartphone use (Billieux et al., 2015; Griffiths, 2005). The symptoms of smartphone addiction observed in individuals may be listed as salience, tolerance, mood modification, conflict, withdrawal, and relapse problems (Griffiths, 2005). Studies on smartphone addiction are increasing in the literature day by day. They reveal that in terms of smartphone addiction, psychological problems (Aktas & Yilmaz, 2017; Bian & Leung, 2015; Bianchi & Phillips, 2005; Cakir & Oguz, 2017; Han et al., 2017; Hussain et al., 2017; Yang et al., 2019), problems related to academic performance (Chen & Lever, 2005; Gezgin et al., 2018; Hawi & Samaha, 2016; Samaha & Hawi, 2016), and behavioral problems related to smartphone use (Akyurek, 2020; Altundag & Bulut, 2017; Bagci, 2018; Gezgin, 2018; Haug et al., 2015) are the subjects of research. It is also observed that the participants of the studies are mostly adolescents and university students, as it is considered that the risk of smartphone addiction is higher among the members of generation Z (www.merriam-webster.com) – – which comprises individuals born after 1996, who make up today's young generation, and exhibit high technology adaptation and usage skills when compared to those of other age groups.

Smartphone Addiction and Gender

The role of gender is controversial yet important in terms of predicting smartphone addiction. There are studies in the literature with differing results in terms of smartphone addiction according to gender. While some of these show that women are more dependent on smartphones than men (Altundag & Bulut, 2017; Cakir & Oguz, 2017; Dogan & İlter-Tosun, 2016; Karahanci, 2018; Kwon et al., 2013; Mok et al., 2014), others show that men are more dependent than women (Hayırcı & Sarı, 2019; Sar, 2013; Yıldız Durak & Seferoğlu, 2018; Zorbaz & Tuzgol-Dost, 2014); some studies also show that there is no difference in terms of smartphone addiction by gender (Dogan & İlter-Tosun, 2016; Gezgin et al., 2018). In addition, in a study on gender, it was shown that the difference in smartphone addiction level in terms of gender varies according to the purpose and behavior of smartphone use. The study stated that the important factors contributing to smartphone addiction are the use of digital games with smartphones for male students, and the use of multimedia applications and social network services for female students (Chen et al., 2017b). Similarly, another study emphasized that male students play more digital games than female students and that their game addiction levels are significantly higher (Ertaş et al., 2018). The findings of a study examining the relationship between smartphone addiction and gender in terms of social stress and social use revealed that men are less likely to use their smartphones for social purposes, since they experience less social stress than women. In line with this finding, the study stated that women face a higher risk of developing habitual or addictive smartphone behaviors (van Deursen et al., 2015). The fact that contradicting results exist in terms of gender reveals the need for further research on the effect of this variable upon smartphone addiction.

Smartphone Addiction and Self-regulation

Self-regulation is the ability to suppress or alter inner reactions, as well as to break down undesirable behavioral tendencies and avoid exhibiting them (Tangney et al., 2004). Self-regulation is required to enable an individual to control and regulate their behavior in order to achieve a goal (Timpano & Schmidt, 2013). In this respect, a high level of self-regulation is important for a balanced and successful life (Duyan et al., 2012). Individuals with a low level of self-regulation, as a combination of attitudinal and behavioral characteristics, bear characteristics such as (a) being unable to delay gratification, (b) trying to reach results following shorter paths, (c) avoiding labor-intensive work, (d) preferring risky and exciting behaviors, (e) being selfish and unsympathetic or careless, and (f) having a weak sense of responsibility (Burger, 2011; DeLisi et al., 2010). In this context, adolescents with poor self-control may be more likely to be addicted to their smartphones after a while, due to their intensive use of applications filled with pleasing or exciting content, such as digital games and social media. As a matter of fact, the literature shows that there are studies investigating the relationship between addiction and self-regulation, and that there

is a negative relationship between self-regulation and (a) internet addiction (Çutuk, 2020; Dawe & Loxton, 2004; LaRose & Eastin, 2004), (b) game addiction (Aksel, 2018; Kim et al., 2008), and (c) smartphone addiction (Ching & Tak, 2017; Gökçearslan et al., 2016; Jeong et al., 2016; Mahapatra, 2019; van Deursen et al., 2015; Wang et al., 2020). Studies on self-regulation state that young people who fail in terms of self-regulation have a higher tendency to display addictive smartphone behavior (Gökçearslan et al., 2016; van Deursen et al., 2015). Another study conducted among adolescents – – who are the main targets of smartphone advertising and are also vulnerable to addiction – – revealed that the basic precursors of smartphone addiction are loneliness and lack of self-regulation (Mahapatra, 2019). Moreover, it has been stated that failure in self-regulation may lead to an increase in the duration of media usage, and further into media addiction (LaRose & Eastin, 2004).

Smartphone Addiction and Academic Procrastination

Briefly, academic procrastination is the delaying of exam preparations, end-of-term projects, or homework, until the last minute (Ferrari et al., 1995; Solomon & Rothblum, 1984). It has been suggested that academic procrastination is a problem associated with motivation – – when individuals are more interested in other activities instead of important tasks such as exam or lesson preparations or doing homework during the day (Dietz et al., 2007), they exhibit delaying behavior. However, in the modern age, it is thought that adolescents' behavior in procrastinating academic work may increase due to the rapid flow of time and the increase of stimulants such as smartphones and social media. The short-term reward mechanism of social media is especially likely to have a negative effect on the overall motivational mechanisms of the young generation. Increasing academic procrastination may lead to disconnection from academic work over time. resulting in the adolescents' academic failure. They may then spend more time with information technology devices, resulting in a vicious cycle. Thus, behaviors such as intense smartphone use and constant smartphone control may pose a risk of smartphone addiction. The literature reveals that there is a relationship both between social media addiction and academic procrastination (Durdu, 2019; Gurultu, 2016; Sahin, 2014) and between internet addiction and academic procrastination (Davis et al., 2002; Demir & Kutlu, 2018; Geng et al., 2018; Odaci, 2011; Sermin & Zeren, 2019). The results of the studies emphasize that the more severe the addiction, the higher the degree of academic procrastination. In line with these results, there are also studies which reveal that academic procrastination can increase the risk of problematic use of smartphones and social media networking (Rozgonjuk et al., 2018; Ryan et al., 2016). Considering that the most prominent usage of smartphones is for the internet and social media (Hussain et al., 2017), the discovery of a relationship between academic procrastination and smartphone addiction in a study among adolescents would not be surprising.

Smartphone Addiction and the Frequency of Smartphone Checking During Study Hours

The excessive use of smartphones and frequent checking of the social media status on these devices can escalate into compulsive use and even mobile phone addiction in individuals over time (Lee et al., 2014). Supporting this claim, a study conducted with adolescents has determined that the variable "frequency of accessing/controlling social media environment via smartphone" is the strongest variable that classifies students with and without addiction (Yıldız Durak & Seferoğlu, 2018). Similarly, a study conducted with the participation of university students stated that students who check the status of their smartphones with increasing frequency during the day risk feeling negative emotions associated with deprivation when they are away from their smartphones (nomophobia) (Gezgin, 2017). Similarly, in a study conducted in terms of business sector and productivity, the continuous checking of smart phones was considered as a step toward smartphone addiction (Duke & Montag, 2014). As can be seen, studies in the literature show that there is a relationship between smartphone addiction and the frequency of checking one's smartphone. In addition, it has been stated that this relationship may be due to the positive emotions provided by the social confidence arising from the behavior of friends on the social media platforms (Billieux et al., 2015) accessed via smartphones. From another point of view, it is stated that individuals who constantly control their smartphones, motivated by social media, do so due to the "fear of missing out" (FoMO) on developments in social networks, and as a result, patterns of social media addiction and smartphone addiction may develop (Elhai et al., 2016; Gezgin, 2018). However, for whatever reason, dysfunctional habits such as the act of beginning with a specific purpose at a certain time and then continuously checking the smartphone screen may start to pose a risk for individuals over time, and this habit can quickly become problematic (Oulasvirta et al., 2012; Park, 2005).

In summary, this study has been constructed based on the body of current academic literature, in order to investigate the effects of gender, self-regulation, academic procrastination, and the frequency of checking the smartphone during study hours, which is defined as a student's study time outside of school. The hypotheses are as follows:

- H1: Gender has an effect on smartphone addiction.
- H2: Self-regulatory failure has a positive correlation with smartphone addiction.
- H3: Academic procrastination has a positive correlation with smartphone addiction.
- H4: The frequency of smartphone checking during study hours has a positive correlation with smartphone addiction.

Methods

Ethics committee approval was received for this study from the Ethics Committee of Trakya University Social and Human Sciences Research (Decision Date and Number: 06.05.2020-03/11). In the study, legal permissions were obtained by the author to collect data from the necessary institutions.

Research Design

This research is a quantitative study, and is structured based on a predictive relational design. Predictive relational designs examine whether two or more variables predict a criterion variable (Creswell, 2012). In this context, the predictive variables of the study are gender, self-regulation, academic procrastination, and frequency of checking the smartphone during study hours. The predicted variable is smartphone addiction.

Participants

The study group consists of 514 high school students studying in private and state schools in Turkey's Marmara region. Two

hundred fifty-three (49.2%) of the participants are male and 261 (50.8%) are female students. Of these students, 100 (19.5%) are in the ninth grade, 110 (21.4%) in the tenth grade, 176 (34.2%) in the eleventh grade, and 128 (24.9%) in the twelfth grade. It has been determined that the average age of high school students is 16.39. In addition, they check their smartphones 3.43 times on average while studying, during a one-hour period.

Instruments

The Smartphone Addiction Scale-Short Form (SAS-SF), developed by Kwon et al. (2013), has been used to measure the smartphone addiction levels of the university students participating in the study. This scale is suitable for the age group studied. Adapted into the Turkish language by Noyan et al. (2015), the scale consists of 10 items. The scale items are graded from 1 (Strongly Disagree) to 6 (Strongly Agree). A higher score obtained from the scale indicates that the risk of addiction is increased. Cronbach's alpha coefficient for the internal consistency and validity of the Turkish form of the scale is .91. In the study, this coefficient value was determined as .87.

The Adolescent Self-regulatory Inventory Scale (ASRI-S) was developed by Moilanen (2005) to determine and evaluate the level of self-regulation among adolescents. There are 32 items in the scale, and it includes a 4-point Likert type scale. The scale items are graded from 1 (It is not like me) to 4 (It looks a lot like me). The scale was adapted to Turkish by Harma (2008). Two dimensions emerged in the exploratory factor analysis – – 18 items on self-regulatory success and 14 items on self-regulatory failure. The internal consistency of the success dimension was found to be .85 and the internal consistency of the failure dimension was found to be .80 in the internal consistency analysis of the scale (Aksel, 2018). The internal consistency of the success dimension in the study was .75; the internal consistency of the failure dimension was determined as .76.

The Academic Procrastination Scale (AP-S), which was developed by Cakici (2003), measures students' tendencies to procrastinate their learning activities such as studying, preparing for exams, and preparing projects. The scale consists of 19 items in total, as 12 negative and 7 positive items. This scale is graded in a 5-point Likert type, and those who say "It does not reflect me at all" to an expression that includes academic procrastination are given a score of 1 point, and those who say "It completely reflects me" get 5 points. The highest score that can be obtained from the scale is 95, the lowest score is 19. The higher the score obtained from the scale, the higher the students' academic procrastination. The value of Cronbach's alpha reliability coefficient of the scale was found to be .92. For this study, the Cronbach's alpha reliability coefficient of the scale was calculated as .84.

Data Collection and Analysis

The research was conducted in the 2018 – 2019 academic year among high school students studying in grades 9 – 12 in various schools in the Marmara region of Turkey. A convenience sampling method was used for establishing the group of participants. The researchers collected the data during April and May, during the respective class times, over the duration of 2 months. First, the students were informed by the researcher about the purpose of the study and taught how to fill in the measurement tools. It took about 15 – 20 minutes for the students to fill out the research form, including the scales and the demographic form. The data obtained in the study were analyzed using the IBM SPSS 23.0 statistics software. Descriptive statistical methods were used in the study to reveal the structure of the characteristics of the students. These descriptive statistics are criteria such as percentage, frequency, mean, and standard deviation. Pearson's correlation technique, one of the parametric tests, was used to determine the relationships between variables in the study. In addition, stepwise multiple regression analysis was conducted to determine the predictive level of the independent variables. Stepwise multiple regression is a process in which the order of variables entered into the equation model is based entirely on statistical criteria (Tabachnick & Fidell, 2015). The feature of the stepwise multiple regression analysis is that it starts with the predictive variable that gives the highest correlation with the dependent variable and will make the largest contribution. Then, the second independent variable that makes the biggest contribution to the variance of the dependent variable together with the first is included in the analysis, and the process continues (Ferguson & Takane, 1989; Nie et al., 1975). In predicting the dependent variable, independent variables without any contribution are removed from the model. There are some assumptions for a stepwise multiple regression analysis. It is understood that in the regression model, the tolerance values are greater than .10 and the VIF value is less than 10; therefore, there is no multi-connection problem (Pallant, 2015). The Durbin – Watson value takes a value between 0 and 4, and when it takes a value of 2, it shows that there is no correlation between the error terms of the independent variables. The closer the Durbin – Watson value to 2, the more the doubt of autocorrelation for the multiple linear regression model is removed (Field, 2013). In addition, before the regression analysis, the z-value in the one-way outlier analysis, and the values of the Mahalanobis distance in the multi-directional outlier analysis are between normal values. Finally, the assumption that the dependent variable shows a continuous and normal distribution, the skewness and kurtosis values between – 1.96 and +1.96, and the results of the examined histograms and Q – Q graphs and P – P graphs are provided (Tabachnick & Fidell, 2007). The values for the descriptive statistics of the variables are shown in Table 1.

Results

The Pearson correlation coefficient technique was used to reveal the relationship between the variables in this study, which examined the relationship between the smartphone addiction level of high school students and their gender, self-regulation, academic procrastination, and frequency of checking the smartphone while studying. Since it is a gender-classified variable, it was included in the analysis by being defined as a "dummy variable." According to this definition, the student is coded with the value "1" if he is male, and "0" if not. Pearson's correlation coefficients were calculated and the five variables were almost all significantly correlated with each other. According to the analysis, a moderately positive significant correlation was found connecting high school students' smartphone addiction with their self-regulatory failure ($r = .402$; $p < .01$), academic procrastination ($r = .327$; $p < .01$), and frequency of checking the smartphone while studying ($r = .392$; $p < .01$). A weakly negative significant relationship was found between smartphone addiction and self-regulatory success ($r = -247$; $p < .01$). A negative relationship was found between self-regulatory success and academic procrastination

Table 1.
Descriptive Statistics of Variables

Variables	N	Min.	Max.	Mean	Std. Dev.	Skewness	Kurtosis
Smartphone Addiction	514	1.00	6.00	3.05	1.125	.199	−.403
Self-regulation Success	514	1.39	4.11	2.72	.441	−.077	.245
Self-regulation Failure	514	1.07	4.71	2.76	.452	−.195	.761
Academic Procrastination	514	1.32	4.95	2.93	.664	−.036	−.090
Smartphone Checking Frequency	514	.00	10.00	3.43	2.158	1.114	1.689

(r = − 409; $p < .01$), frequency of smartphone checking while studying (r = − 241; $p < .01$), and a positive relationship between self-regulatory failure and academic procrastination (r = .352; $p < .01$), and frequency of smartphone checking while studying (r = .242; $p < .01$). In addition, an analysis of the findings in terms of gender shows that smartphone addiction is increased among females. In line with the findings, as the students' failure with self-regulation increases, academic procrastination and the frequency of checking the smartphone while studying increase, and the students' level of smartphone addiction also increases. The data of the relationships between variables in the study are shown in Table 2.

Stepwise multiple regression analysis was conducted to determine the effect of gender, self-regulation, academic procrastination, and frequency of checking the smartphone during study hours on the high school students' smartphone addiction. The variables of significance in the Pearson correlation analysis, to be included in the regression model, were determined. In this direction, the "self-regulatory failure" variable, which has a higher level of relationship with smartphone addiction, was included in the stepwise multiple regression analysis. It is seen that the self-regulatory failure variable explains 16.2% of the variance related to smartphone addiction. In the second stage of the analysis, the variable "frequency of checking the smartphone while studying" was considered. An increase of 9.2% was observed in the variance explained by the inclusion of this variable in the regression analysis. Thus, the explained variance reached 25.4%. In the third stage of the analysis, the variable of "gender" was considered. An increase of 3.6% was observed in the variance explained by taking the gender variable into the regression equation, thus the explained variance reached 29.0%. Finally, the "academic procrastination" variable was included in the analysis in the fourth step. An increase of 1.0% was observed in the variance explained by taking the academic procrastination variable into the equation, thus the explained variance reached 30.0%. The data of the stepwise multiple regression analysis results are shown in Table 3.

Table 3 was examined and it was determined that the ASRI-S Failure, SCF, gender, and AP-S variables were significant predictors of smartphone addiction, while the ASRI-S Success variable was not a significant predictor, seen as a result of the stepwise regression analysis. Therefore, the ASRI-S Success variable was removed from the model. In addition, the ASRI-S Failure variable was found to be a strong predictor of smartphone addiction. Finally, it is seen that the model consisting of the ASRI-S Failure, SCF, Gender, and AP-S variables explain 30.0% (adjusted) of the variability in smartphone addiction.

Discussion

The findings of the study were examined, and it was determined that high school students' gender, self-regulatory failure, frequency of checking the smartphone during study hours, and academic procrastination were associated with smartphone addiction. It also explained 30% of the variance in the variables of smartphone addiction. It has been observed that the strongest predictor of smartphone addiction is self-regulatory failure, and this finding reveals that high school students who are unsuccessful in self-regulation are more at risk in terms of smart phone addiction. Similarly, in a study conducted with university students, it was found that students with low self-regulation skills are more prone to smartphone addiction (Gökçearslan et al., 2016).

Table 2.
Correlation Coefficient Matrix Between Variables

Variables	SAS-SF	Gender	ASRI-S Success	ASRI-S Failure	AP-S	SCF
SAS-SF	1					
Gender	−.215*	1				
ASRI-S Success	−.247**	.066	1			
ASRI-S Failure	.402**	−.186**	−.297**	1		
AP-S	.327**	.101*	−.409**	.352**	1	
SCF	.392**	.093*	−241**	.242**	.474**	1

Note: AP-S = Academic Procrastination Scale; ASRI-S = Adolescent Self-regulatory Inventory Scale; SAS-F = Smartphone Addiction Scale—Short Form; SCF, Smartphone Checking Frequency.
**Correlation is significant at the .01 level (two-tailed).
*Correlation is significant at the .05 level (two-tailed).

Table 3.
Stepwise Regression Analysis Results for the Prediction of Smartphone Addiction

Model		Unstandardized Coefficients		Standardized Coefficients				
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.284	.282		1.005	.315		
	ASRI-S Failure	1.000	.101	.402	9.944**	.000	1.000	1.000
2	(Constant)	.244	.266		.916	.360		
	ASRI-S Failure	.812	.098	.326	8.291**	.000	.941	1.062
	SCF	.163	.021	.313	7.959**	.000	.941	1.062
3	(Constant)	.703	.276		2.551	.011		
	ASRI-S Failure	.705	.098	.284	7.199**	.000	.898	1.114
	SCF	.178	.020	.342	8.793**	.000	.922	1.085
	Gender	−.436	.086	−.194	−5.052**	.000	.945	1.058
4	(Constant)	.437	.291		1.501	.134		
	ASRI-S Failure	.622	.102	.250	6.102**	.000	.817	1.223
	SCF	.153	.022	.294	6.934**	.000	.764	1.309
	Gender	−.467	.087	−.208	−5.399**	.000	.929	1.077
	AP-S	.203	.075	.120	2.713**	.007	.703	1.423

Note: $^{**}p < .01$.
1. r: 402, R2: 162, F(1.512): 98.880, $p < .01$.
2. r: 504, R2: 254, F(2.511): 87.138, $p < .01$.
3. r: 538, R2: 290, F(3.510): 69.387, $p < .01$.
4. r: 548, R2: 300, F(4.509): 54.529, $p < .01$
Durbin – Watson: 2.006.
Y = .437 + .622 (ASRI-S Failure) + .153 (SCF) − .467(Gender) + .203(AP-S).

In another study, it has been stated that addictive behaviors may result from failure in self-control skills (van Deursen et al., 2015). When the characteristics of adolescents who do not have self-control are examined, it may be seen that this is due to their fear of assuming responsibility, and in some cases, their low self-confidence (Yörükoglu, 2003). Therefore, it is thought that they may prefer social media or digital games to get away from these negative situations they experience, and thereby feel more comfortable. These behaviors related to smartphone use may result in adolescents' long-term use of smart phones, the gateway to the virtual world and digital games. Therefore, intensive use of smartphones – – which are identified as "bodily organs" of the individual (Gezgin et al., 2019) due to these applications, can cause smartphone addiction. The truth about smartphone addiction is that people are not actually addicted to the smartphone device per se; but they are rather dependent on the information, entertainment, and personal connections that it provides (Emanuel et al., 2015).

The study revealed a positive relationship between smartphone addiction and academic procrastination. In addition, academic procrastination was found to be positively correlated with self-regulatory failure and negatively associated with self-regulatory success. Supporting this finding, it was stated in a study that students with academic procrastination tend to use more social media during lectures and this could be the driving force of problematic smartphone use (Rozgonjuk et al., 2018). In another study, the results revealed a correlation among self-regulated learning, academic procrastination, and smartphone addiction. Additionally, both self-regulated learning and academic procrastination predicted smartphone addiction, and academic procrastination was found to be a more potent predictor than self-regulated learning in the study. As a result of these findings, students who are not expected to have any risk for smartphone addiction can use highly self-regulated learning strategies, which increases our awareness of the negative impact of smartphone addiction on students (Saad, 2020). In support of other findings in the study, the findings obtained in the study conducted by Park and Sperling (2012) showed that academic procrastination is associated with poor self-regulation skills. In another study, it was seen that depression, self-esteem, and anxiety measures accounted for 14% of the variance in academic procrastination and 25% of self-regulation variables. However, the study, emphasized that self-regulation affects academic procrastination but has different motivational factors (Senécal et al., 1995). When we examine the frequency of checking the smartphone during study and academic procrastination, it is seen that there is a moderate positive relationship between them. Supporting this situation in terms of learning, a study examining the relationship between FoMO (Gezgin, 2018), one of the strong predictors of smartphone addiction, and surface learning, showed that the relationship was caused by the frequency of daily interruption in activities due to the smartphone (Rozgonjuk et al., 2019). Therefore, it can be said that behaviors such as using smart phones for any reason during the study hours negatively affect the students' academics. Finally, according to the findings of the study, it is thought that adolescents who tend to display academic procrastination face a risk of smartphone addiction. In addition, it is thought that lack

of self-regulation skills may cause academic procrastination, and this will contribute to smartphone addiction.

Considering the findings of the study in terms of gender, it is seen that the potential for smartphone addiction is higher in female than in male students. A study conducted with university students stated that female students are more inclined to smartphone use than males. It also revealed that this situation may be related to the different media usage habits of the genders in terms of smartphone addiction (Liang & Leung, 2018). In another study, it was stated that the factors associated with smartphone addiction in male students were the use of game apps, anxiety, and low sleep quality, while the important factors for female students were the use of multimedia applications, the use of social network services, depression, anxiety, and low sleep quality (Chen et al., 2017a). Contrary to the findings of the study, another study found that male students were more prone to problematic smartphone use than female students, and the diversity of the usage of smart phone applications was emphasized (Bisen & Deshpande, 2016). As can be seen, the role of gender in terms of smartphone addiction varies according to the habits and purposes of use.

Finally, the increase in frequency of checking the smartphone during study hours contributes to the increase in the smartphone addiction level of adolescents, as seen in the study. A previous study conducted with 161 high school students stated that the students were interested in operating their social media accounts on their smartphones and this increased their smartphone addiction (Gezgin, 2018). Another study suggested that smartphone addiction increased due to the participants' habit of checking their smartphone when they heard a notification sound or message on the smartphone (Oulasvirta et al., 2012). The excessive use of smartphones and their frequent control behavior may eventually push smartphone users into compulsive use and even smartphone addiction (Lee et al., 2014). When examined from another angle, among the symptoms of smartphone addiction are constantly checking the smartphone for no reason and being distracted by mobile applications (Chen, 2020; Hong et al., 2012). However, since addiction does not occur suddenly, these behaviors must first develop in the addiction cycle (Dinc, 2005). Although the frequent checking of smartphones may be a behavior that adolescents acquire during their spare time, the study does not focus on their relationships with other factors. However, it is also thought that individuals who have problems in terms of academic procrastination and self-regulation may frequently use their smartphones during their study time, and this may pose a risk for smartphone addiction after a while.

In this study, the smartphone addiction levels of the students with poor self-regulation skills were found to be high. In this respect, it is seen that self-regulation is one of the important life skills that prevent smartphone addiction. Families and educational institutions have significant responsibilities in fostering self-regulation skills. Adolescents with a higher level of self-regulation are known to be mostly the children of individuals with a positive parenting style, and the skill of self-control reduces the risk of smartphone addiction (Ching & Tak, 2017). Therefore, it is important to develop programs that improve parenting and develop self-regulation skills to reduce the risk of smartphone addiction among adolescents (Kwan & Leung, 2016). In addition, the educational institutions, which play an active role in ensuring the psychological and educational well-being of adolescents, should support students in terms of self-regulation, and help them acquire skills such as emotional intelligence and self-regulation (Mascia et al., 2020).

Nowadays, it is normal behavior to use smartphones to access reference material in teaching and to examine course topics during study. However, this study also shows that the increased frequency of checking the smartphone during study hours contributes to smartphone addiction. Technology addiction, as a behavioral addiction, is the culmination of a process. Therefore, adolescents, under parental control, should be prevented from spending time with smartphones and using them intensively, for whatever purpose, especially in their spare time, ensuring that that they do not pay too much attention to their smartphones. In addition, care should be taken that adolescents do not abuse this situation while studying.

Limitations

This research has some limitations. First, the difficulties experienced in collecting quantitative data through questionnaires can be considered as a limitation. Reaching a small number of participants, due to the difficulty in obtaining permission from the necessary institutions for such studies on adolescents, may also be cited as a limitation,. In addition, the study primarily examined the relationship between academic work habits and smartphone addiction. However, it is not known whether there were other pathological disorders among the participants in the study. Finally, the information obtained within the framework of the permissions for the adolescents that made up the sample was limited.

Directions/Suggestions for Future Research

It is recommended that teachers, families, and adolescents organize trainings, practice sessions, and seminars in order to raise awareness about the relationship between smartphone addiction and studying.

Finally, in future academic studies, a model study of the variables discussed in this work, including smartphone addiction, gender, self-regulation, academic procrastination, and frequency of checking the smartphone during study hours, may contribute to research in the field.

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Genişletilmiş Özet

Giriş

Günümüzde bilişim teknolojilerinde yaşanan hem donanım hem de yazılım açısından hızlı gelişmeler, bireylerin günlük yaşamlarını kolaylaştırmaktadır. Özellikle bankacılık işlemleri, çevrimiçi alışveriş ve hastane randevularının planlanması gibi işlemler artık mobil cihazlar aracılığıyla yapılmaktadır. Bu açıdan cep telefonlarının geleneksel özelliklerine (çağrılar, SMS vb.) ek olarak; akıllı telefonlar ve bunlara bağlı mobil uygulamalar, özellikle bireylerin yaşamlarında vazgeçilmez bir araç haline gelmiştir. Başka bir açıdan ise boş zamanı doldurmak, iletişim ve sosyalleşmek için akıllı telefonlar çekici ortamlar sağlamaktadır. Fakat akıllı telefonların insan hayatına getirdiği kolaylık, hareketlilik ve diğer işlevlerin yanı sıra yoğun ve sorunlu kullanımları, psikolojik, sosyal ve sağlıkla ilgili olumsuz etkileri olan birçok sorunu da bir araya getirebilmektedir. Bu olumsuz durumlardan biri de akıllı telefon bağımlılığıdır. Akıllı telefon bağımlılığının belirtileri arasında aşırı akıllı telefon kullanımı ve akıllı telefona karşı yoksunluk durumu geliştirme gösterilebilir. Özellikle içsel motivasyon amaçlı eğlence, sosyalleşme ihtiyacını karşılamak için yoğun olarak akıllı telefon kullanan bireylerin akıllı telefon alışkanlıkları daha hızlı gelişmekte ve bu da bağımlılık yaratan akıllı telefon davranışına yol açabilmektedir. Ayrıca düşük öz denetim kapasitesi gibi kişisel özelliklerin akıllı telefon bağımlılığına katkı sağladığı düşünülmektedir. Ayrıca akıllı telefon bağımlılığı açısından cinsiyetin akıllı telefon bağımlılığını yordayabileceği de ortaya koyulmuştur. Bu doğrultuda akıllı telefon kullanım alışkanlıkları ve motivasyonunun araştırılmasında özellikle ergenler arasında öz düzenleme ve cinsiyet gibi değişkenlerin değerlendirmeye değer olabileceği düşünülmektedir.

Yöntem

Bu çalışma, hem açıklayıcı hem de yordayıcı olarak ilişkisel tarama modeline dayanan betimsel bir araştırmadır. Çalışmada yordayan değişkenler cinsiyet, öz denetim, akademik erteleme ve çalışma saatleri sırasında akıllı telefon kontrolünün sıklığı, yordanan değişken ise akıllı telefon bağımlılığıdır. Bu çalışmanın örneklemi 261'i kız öğrenciler ve 253'ü erkek öğrenciler olmak üzere 514 katılımcı oluşturmaktadır. Çalışmada veriler ergenler için Akıllı telefon bağımlılığı kısa formu, Ergenler için özdenetim ölçeği formu, Akademik kaytarma ölçeği formu ve Kişisel Bilgi Formu ile toplanmıştır. Verilerin analizinde Pearson korelasyon analizi ile adımsal çoklu regresyon analizinden yararlanılmıştır.

Bulgular

Öncelikle ilk aşamada değişkenler arasındaki ilişkileri incelemek için yürütülen analiz sonuçlarına göre, akıllı telefon bağımlılığı ile lise öğrencilerinin öz düzenleme başarısızlığı ($r = ,402$; $p < ,01$) ve akademik erteleme eğilimi ($r = ,327$; $p < ,01$) arasında orta düzeyde pozitif yönde anlamlı bir ilişki bulunmuştur. Ek olarak akıllı telefon bağımlılığı ile ders çalışma esnasında akıllı telefon kontrol sıklığı arasında pozitif yönde anlamlı bir ilişki olduğu tespit edilmiştir($r = ,392$; $p < ,01$). Ayrıca cinsiyet açısından elde edilen bulgular incelendiğinde, kız katılımcılarının varlığı arttıkça akıllı telefon bağımlılığı arttığı tespit edilmiştir.

İkinci aşamada ise cinsiyet, öz denetim, akademik erteleme ve akıllı telefon kontrolünün sıklığının lise öğrencilerinin akıllı telefon bağımlılığı üzerindeki etkisini belirlemek için yürütülen aşamalı çoklu regresyon analizinin ilk aşamasında modele giren ilişkisel analizde akıllı telefon bağımlılığı ile diğer değişkenlere göre yüksek düzeyde ilişkisi tespit edilen öz denetimde başarısızlık değişkeninin akıllı telefon bağımlılığına ilişkin varyansın %16,2'sini açıkladığı görülmektedir. Analizin ikinci aşamasında, "ders çalışırken akıllı telefonu kontrol etme sıklığı" değişkeni alınmıştır. Bu değişkenin regresyon analizine dahil edilmesi ile açıklanan varyansta %9,2'lik bir artış gözlenmiştir. Böylece açıklanan varyans %25,4'e ulaşmıştır. Analizin üçüncü aşamasında "cinsiyet" değişkeni alınmıştır. Cinsiyet değişkeni regresyon denklemine alınarak açıklanan varyansta %3,6 oranında artış gözlenmiş ve açıklanan varyans %29,0'a ulaşmıştır. Son olarak, dördüncü adımda analize "akademik erteleme" değişkeni dahil edilmiştir. Akademik erteleme değişkeninin denklemine alınmasıyla açıklanan varyansta %1,0'lık bir artış gözlenmiş ve açıklanan varyans %30,0'a ulaşmıştır.

Tartışma

Bu çalışma sonucunda akıllı telefon bağımlılığının çalışmadaki en güçlü yordayıcının öz denetim becerisi olduğu tespit edilmiştir. Bu bulgu sonucunda öz denetim becerisindeki başarısızlığı artması ergenlerin akıllı telefon bağımlılık riskini ya da düzeyini arttırmaktadır. Bu açıdan akıllı telefon bağımlılığını ile mücadelede öz denetim becerisinin önemli bir unsur olduğu söylenebilir. Bu bağlamda ergenlerin öz denetim becerilerini geliştirebilmeleri için ailelere ve eğitim kurumlarına önemli sorumlulukları düşmektedir. Çünkü öz denetim düzeyi daha yüksek olan ergenlerin çoğunlukla olumlu ebeveynlik tarzına sahip bireylerin çocukları olduğu bilinmektedir ve öz denetim becerisinin yüksek olması akıllı telefon bağımlılığı riskini azaltabilme potansiyeli taşımaktadır. Bu açıdan ebeveynlik ve öz düzenleme becerilerini geliştiren programların geliştirilmesinin ergenlerde akıllı telefon bağımlılığı riskini azaltmada önemli olduğu görülmektedir. Ek olarak, duygusal zekâ ve öz denetim gibi ergenlerin psikolojik ve eğitimsel refahını sağlamada aktif rol oynayan eğitim kurumlarında öz denetim açısından öğrenciler desteklenebilir.

Sınırlılıklar

Bu araştırmanın bazı sınırlılıkları vardır. İlk olarak, nicel verilerin toplanma sürecinde yaşanan zorluklar sınırlılık olarak verilebilir. Ergenler üzerinde yapılacak böyle çalışmalar için gerekli kurumlardan izin alınmasının güçlüğü yüzünden sınırlı katılımcıya ulaşılması bir sınırlılık olarak verilebilir. Ayrıca çalışmada öncelikli olarak akademik anlamda bir çalışma alışkanlığı ile akıllı telefon bağımlılığı

arasında ilişki incelenmiştir. Fakat çalışmada katılımcılar arasında başka patolojik bozuklukların olup olmadığı bilinmemektedir. Son olarak, örneklemi oluşturan ergenlere ait izinler çerçevesinde sınırlı bilgiye ulaşılmıştır.

Uygulayıcılara ve Araştırmacılara Öneriler

Öğretmenler, aileler ve ergenlere, akıllı telefon bağımlılığı ve ders çalışma arasındaki ilişki konusunda farkındalık kazandırmak açısından eğitimler, uygulamalar ve seminerler düzenlemesi önerilmektedir.

Son olarak, gelecekteki akademik çalışmalarda, bu çalışmada tartışılan değişkenler olan akıllı telefon bağımlılığı, cinsiyet, öz denetim, akademik erteleme ve çalışma saatleri sırasında akıllı telefon kontrolünün sıklığı arasında bir model çalışması alana katkı sağlayabilir niteliktedir.