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The Effect of Free Time Management Skills upon Smartphone Addiction Risk in University Students

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Abstract

The purpose of this study is to investigate the effect of free time management skills upon smartphone addiction risk in university students. The study follows a relational screening model of research and makes use of descriptive analyses alongside correlation and stepwise regression statistical methods. The study group consists of 591 university students. A glance at the findings indicate that the overall smartphone addiction risk in the study group is relatively low and that a statistically significant yet weak and negative relationship exists between smartphone addiction risk and free time management skills. Three out of the four sub-dimensions of free time management scale; namely "scheduling", "leisure attitude" and "goal setting" were found to be have statistically significant correlations with smartphone addiction risk at moderate, weak and weak levels respectively. Lastly, a stepwise regression test has shown that the "scheduling" sub-dimension alone is a significant predictor of smartphone addiction risk, explaining 15.2% of variance in scores. In conclusion, these findings may be interpreted as the possession of higher free time management skill in university students is associated with lower risk of smartphone addiction. The basis of this phenomenon may be inclination of some students to prefer spending all their free time using their smartphones, due to lack of management skills. The results have been further discussed further under the light of associated findings in the academic literature and implications for future research have been made.

Introduction

Smartphones are devices that carry similar functionality with and yet display much higher capabilities of information processing and connectivity than regular mobile phones. (Ada & Tatli, 2012). Smartphones have undeniably dominated human lives in beginning of the 21st century, opening the doors to many possibilities in the lives of individuals. However, as more and more people start to rely on smartphones for fulfilling all their daily life needs, cases of overuse have also become commonplace. Some recent entries in academic literature are prone to classify extreme cases of smartphone reliance and overuse as a form of addiction and inspect this phenomenon from psychological, sociological, cultural, economic and pedagogic perspectives (Bal & Balçı, 2020).

Smartphone addiction is defined as a non-chemical impulse-control disorder similar to pathological gambling (Griffiths, 2005; Park & Lee, 2011). Smartphone addiction also consists of common addiction components such as salience, tolerance, mood modification, conflict, withdrawal and relapse (Griffiths, 2005). The combination of these results in a negative impact upon the life standard and quality of an individual. Although numerous studies have been focusing on the concept of smartphone addiction in the recent years; there also seems to be a growing issue in the academic literature regarding the way it is handled as a valid form of technological addiction akin to video gaming addiction or internet addiction (Yu & Sussman, 2020). Some recent studies that investigate the concept from a critical point of view, concluding that smartphone addiction as commonly discussed in the academic literature does not meet the requirements to actually be referred to as an addiction and instead should be considered only as problematic use (Lowe-Calverley & Pontes, 2020; Panova & Carbonell, 2018). Panova and Carbonell use a metaphor of addicts making use of needle injections in administering the harmful substance heroin into their bodies and illustrate that smartphone is merely a delivery agent not unlike a needle that may or may not contain harmful substances or may or may not be used abusively. Jeong, Suh and Gweon's study (2020) therefore tries to somehow differentiate the "needle" from the "substance" somehow, investigating the factors contributing to both smartphone and internet addictions and coming up with conclusions that may be interpreted as internet addiction being the more comprehensive framework among the two. Supporting this claim, Chou & Chou (2019) have investigated a sample of Taiwanese students and

discovered that heavy engagement with social networks, online games or online shopping via smartphones is the actual underlying cause of problematic smartphone use; regardless of gender or household income levels. Nevertheless, the claim stands that most studies in the literature handling the issue of smartphone addiction have failed to investigate the etiological origins or causal pathways of smartphone addiction (Yu & Sussman, 2020). A recent study employing magnetic resonance imaging and handling the issue on a medical standpoint, however, has investigated brain volume and neurological activity of participants scoring high on self-reported smartphone addiction scales (while excluding those who have scored high also on gaming addiction scales); and provided evidence that aberrant neurological activity hinting at a valid case of addiction is present in these individuals (Horvath et al., 2020).

Despite being a disputed concept, an overall glance at studies conducted throughout the better half of the previous decade shows that smartphone addiction is an alarming concern that continues to grow worldwide (Olson et al., 2020). Numerous studies in the recent have therefore especially investigated the phenomenon within an audience of adolescents and university students. This could be due to generation-z being born into a world of information technology as digital natives and thus having a greater risk of smartphone addiction accompanying a greater rate of technology adoption than older generations. Buctot et al. (2020) investigate the effect of smartphone addiction upon health-related quality of life in adolescents, which they break into the three categories of a) physical well-being, b) psychological well-being and c) school environment; and report that smartphone addiction negatively impacts all three elements of an adolescent's life. The underlying mechanics of smartphone addiction have been investigated and found to be associated with positive and negative reinforcement aspects of the reinforcement reward (such as dopamine release) concept; as well as habitual behavior (Chen et al., 2019). This is to say, smartphone users begin their problematic use patterns due to both feeling of enjoyment during time they spend using their devices and feeling of relief from negative emotions. In time, these reinforced use patterns develop into habits and become even more permanent. Moreover, it was also established by the study that people that find their smartphones as a resort for escaping negative feelings of daily life are more prone to develop an addiction than those who simply enjoy using their phone too much. Jeong et al. (2020) studied contributing factors to smartphone addiction in adolescents extensively, coming up with a list 12 factors that increase the risk in adolescents: a) Depression, b) Anxiety, c) Self-control, d) Life satisfaction, e) Aggression, f) Parent-Child communication time, g) Parent-Child Attachment, h) Parent-Child Relationship, i) Domestic Violence, j) Teacher Support, k) Teacher-Child Relationship and l) Learning Motivation. In another study, which investigated the contributing factor of parental neglect in adolescent smartphone addiction levels (Kwak et al., 2018), it was discovered that in addition to improving family relationships; expanding leisure activity grounds for adolescents and helping them develop healthier relationships with friends in the offline world would help decrease their smartphone addiction levels. Many studies take into account the factor of gender while investigating contributing factors to smartphone addiction; albeit coming up with inconsistent results. A recent study conducted among adolescents in Japan and Thailand has shown that in both countries, smartphone addiction was more prevalent in females than males (Tangmunkongvorakul et al., 2020). There exist however, other studies conducted within the same year that indicate opposite results (Buctot et al., 2020). A conclusive remark has been made by Olson and colleagues (2020), however, by carrying out a meta-analysis covering 82 studies conducted between 2014 and 2020 within 24 countries and discovering that smartphone addiction risk seems higher in younger and female populations.

Also working with adolescents, Chou & Chou (2019) have reported that parent-mediated control strategies are not effective in helping their children overcome problematic smartphone use. Defining self-regulation as 'self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal goals', Mahapatra (2019) investigated smartphone use in 330 adolescents and concluded that lack of self-regulation, alongside loneliness, significantly predicts smartphone addiction likelihood. Kim et al. (2018) also dealt with the idea and discovered similar results by working with a group of 3380 Korean adolescents, reporting that friendship quality alongside self-control (which has been defined as 'an individual's ability to control his/her emotions, thoughts, and behaviors against impulses and temptations') skills help reduce smartphone addiction risk.

Researchers in Romania have conducted a comprehensive study to compare adolescents and university students in terms of smartphone use patterns within the scope of smartphone addiction (Cocoradă et al., 2018). They have concluded that high school students are more prone to confessing an addiction to their smartphones and that at this age group, smartphone addiction is more related to entertainment or communication related tasks such as heavy social-network-related use, gaming-related use, as well as video streaming and phone calling. University students, on the other hand, have reported using their smartphones for a greater variety of purposes and showed greater likelihood to experience a fear of missing out on technology use. In another study, Meena and colleagues report that in undergraduate students; smartphone addiction is associated with factors such as

loneliness, shyness, social anxiety and external locus of control (Meena et al., 2021). Nevertheless, university students have been reported to suffer from problems like academic failure (Hawi & Samaha, 2016; Huang & Leung, 2009; Kibona & Mgaya, 2015), reduced physical and social activity level (Lepp et al., 2013; Kim et al., 2015; Samaha & Hawi, 2016), sleep problems (Sahin et al., 2013; Thomée et al., 2011) due to smartphone addiction. Like all other addictions, smartphone addiction also progresses gradually (Dinç, 2015) and it can be claimed that the rate of this progress is higher during free time, in which young people engage with their smartphones as a leisure activity. As discussed before, parental supervision is an important factor in preventing smartphone addiction in the young generation and yet, it should also be considered that university students are mostly individuals who have just left the boundaries of close parental supervision. Research in similar vein have displayed how university students mostly prefer spending time on the Internet during their leisure (Minaz & Bozkurt, 2017) and as reliance on information technology products such as social media and digital games as free time activities increases, so will the risk of addiction to these.

Free time may be defined as time during which an individual is capable of performing tasks and activities that a) lie outside of the boundaries of the individual's responsibilities and b) provide mental or physical fulfillment alongside a sense of enjoyment (İskender, 2019). For this reason, free time that is typically outside work hours is highly important for all people (Kuş-Şahin et al., 2009). Inclusion of enjoyable activities in their daily lives helps people feel vigorous and content. Proper use of free time also helps people alleviate boredom resulting from tedious daily routines and even helps increase work success (Yeniçeri et al., 2002). Although free time is highly influential on the welfare of both the individual and the society, many people fail to properly manage their free time. Whereas the success in free time management leads to individual and social progress; lack of success leads to individual and social problems (Yaşartürk et al., 2018). Kır (2007) has studied university students and similarly emphasizes the importance of availability of free time in character development and societal progress. The case of high school students is not entirely different, as displayed in Eranıl and Özcan's (2018) work, which reports that they are not very successful in managing their free time either and that as free time management skills get better in high school students, so do academic performance and relationship with parents. Free time management is closely tied with the scheduling skills and it has also been shown that better scheduling skill in university students is related to higher academic scores (Tektaş & Tektaş, 2010). As it is evident in the literature, free time is an important aspect of human life.

In order to manage free time well and prevent spending too much time on superfluous activities, individuals need to know their responsibilities and arrange their priorities accordingly (Aydoğan & Gündoğdu, 2006). Free time management requires the assessment of an individual's existing needs and demands, the setting of goals in order to meet these and the scheduling of these into a task sequence based on priority. Task-planning, scheduling and to-do lists are therefore important in arranging one's free time (Wang et al., 2012). However, it has been recently observed that the young generation is unable to manage their free time well and this results in them spending free time mostly by engaging with electronic products such as smartphones, computers and the Internet. (Tektaş & Tektaş, 2010; Minaz & Bozkurt, 2017). A study, which associates this phenomenon with personality traits and other circumstances has shown that young people who suffer from lack of a) choices for spending their free time, b) an active social circle, c) motivation to engage with any activity or interact with other people due to any number of reasons resort to technological devices, which are usually cheaper and more easily accessible than most other options, for avoiding boredom (Dinç, 2015). In today's world, the default choice of entertaining technological device is the smartphone and the diverse range of mobile applications that it offers. Being attached to the smartphone as the sole source of entertainment and relaxation is certain to invite the risk of smartphone addiction. A study by Wang (2019) covers internet addiction, which is another form of technological addiction, and reports that higher sense of boredom during one's free time is associated with greater risk of internet addiction and that free time management skills significantly help alleviate the feeling of boredom during free time. Under the light of such information, it may be extrapolated that skill in free time management may also help reduce the risk of smartphone addiction.

Hippocrates of Classical Greece, who is commonly considered the Father of Modern Medicine is quoted saying "The best way to cure a disease is to teach folks how not to fall victim to it in the first place". It is therefore important to investigate by academic research not only the effects of smartphone addiction but also its causes and preventive measures. A current glance at the literature shows lack of research investigating the relationship between smartphone addiction and free time management skills. The purpose of this research is to therefore investigate the relationship between smartphone addiction levels and free time management skills in university students. In this context, the following research questions have been formulated:

1. How prevalent is smartphone addiction in Turkish university students?

2. Is there a relationship between free time management skills and smartphone addiction in university students?
3. As far as university students are concerned, do better skills in managing one's free time help against smartphone addiction risk?

Method

Research Model

Similar to many studies in the literature investigating the relationships between smartphone addiction and certain factors, this quantitative, cross-sectional follows descriptive and correlational models. A descriptive model of research is where a population with numerous members is screened for entirely or partially through the use of a representative group or sample, in order to reach certain conclusions about the said population (Karasar, 1995). The correlational pattern seeks to establish the presence of a meaningful relationship between two or more variables via statistical tests of correlation (Creswell, 2012). The choice of correlational model is primarily due to the need to investigate whether the change in levels of smartphone addiction and free time management skills in university students generate a meaningful pattern.

Study Group

The population for this study has been designated as students enrolled at state universities in Turkey during the 2019-2020 academic year. Convenience sampling method has been employed to create a study group of 591 students studying in 45 different associate degree (2-year) or bachelor's degree (4-year) programs found in 4 Turkish universities. The study group is comprised of 164 (27,7%) males and 427 (72,3%) females. As for study years, 319 of the study group participants (54,0%) consists of freshman (1st grade) students; whereas 101 participants were 2nd year (17,1%), 42 were 3rd year (7,1%) and 129 were 4th year (21,8%) students. Average age of participants were found to be $\bar{X} = 20,67$. Demographic information of study group participants has been shown in Table 1.

Data Collection Instruments

A survey form prepared by the authors, which consists of four sections, has been used for the collection of data.

Section 1 – Personal Information

This section has been prepared to collect demographic data of participants; including gender, age, department of study and years studied in the said department.

Section 2 – The Smartphone Addiction Scale (SA-S)

The original version of the scale has been developed by Known et al. (2013) based on items prepared by Young (1998) pertaining to Internet addiction and the future of smartphones. The scale has been adapted to Turkish language by Demirci, Orhan, Demirdaş, Akpınar and Sert (2014). The Turkish Version of the Smartphone Addiction Scale is a reliable and valid instrument for assessing smartphone addiction risk. The factor analysis of this Turkish version showcases 7 factors in total and factor loads of items range between 0,349 to 0,824, with an overall score of 0,947 for the scale.

Sub-dimensions consist of "Daily-Life Disturbance" (5 items), "Positive anticipation" (8 items), "Withdrawal" (6 items), "Cyberspace-oriented Relationship" (7 items), "Overuse" (4 items) and "Tolerance" (3 items). The Smartphone Addiction Scale consists of 33 6-point Likert scale items with a score of 1 denoting "Certainly Disagree" and a score of 6 denoting "Certainly Agree". Total attainable scores range between 33 and 198 with higher scores attained on the scale being interpreted as greater risk of smartphone addiction. The study reports a Cronbach's Alpha reliability score of 0,92 for the scale.

Table 1. Demographic information on study group participants

Category	Frequency	Percentage
<i>Gender</i>		
Male	164	27,7
Female	427	72,3
<i>Study Year</i>		
1st Year	319	54,0
2nd Year	101	17,1
3rd Year	42	7,1
4rd Year	129	21,8
<i>Program</i>		
Elementary Education	59	10,0
English Language Education	54	9,1
Labor Economics and Industry Relations	32	5,4
Preschool Education	29	4,9
Culinary Arts	28	4,7
Psychological Guidance and Counseling	27	4,6
Child Development	25	4,2
Public Administration	25	4,2
Mathematics Education	23	3,9
Physical Education	20	3,4
Sports Administration	20	3,4
Business Administration	18	3,0
Medical Administration	17	3,0
Instructional Technology	15	2,9
Music Teaching	15	2,5
Economics	14	2,5
Turkish Language Education	14	2,4
Nutrition and Dietetics	12	2,4
International Relations	11	2,0
Management Information Systems	11	1,9
Nursing	10	1,9
Fine Arts Teaching	9	1,7
History	9	1,5
Sports Coaching	8	1,4
Finance	8	1,4
Tourism Administration	8	1,4
Turkish Literature	7	1,2
Veterinary Science	7	1,2
Computer Programming	5	0,8
Econometrics	5	0,8
Graphical Design	5	0,8
Albanian Language and Literature	4	0,7
Midwifery	4	0,7
Food Engineering	4	0,7
Social Sciences Education	4	0,7
German Language Education	3	0,5
Biology	3	0,5
Foreign Trade	3	0,5
Public Relations	3	0,5
Emergency Medical Care	3	0,5
Science Education	2	0,3
Physiotherapy	2	0,3
Mathematics	2	0,3
Special Needs Education	2	0,3
Sociology	2	0,3
<i>Total</i>	591	100,0

Free Time Management Scale (FTM-S)

The original version of the scale has been developed by Wang, Kao, Huan and Wu (2011), the form has been adapted to Turkish language by Akgül and Karaküçük (2015). The Free Time Management Scale (FTM-S), consists of 15 5-point Likert type items (1= Strongly Disagree, 5= Strongly Agree) and is divided into four sub-dimensions, namely "scheduling", "leisure attitude", "evaluation" and "goal setting". Cronbach's Alpha Reliability coefficient for the scale has been found to be 0.83 and test-retest reliability has been established as 0.86. Internal consistency coefficients for the sub dimensions range between .71 and .81. The reliability and validity studies also show that while the scale itself consists of four factors, it may also be used with a single factor (Akgül ve Karaküçük, 2015). In the study, the Cronbach Alpha value of the whole scale was determined as 0.84. The Cronbach alpha values of the sub-dimensions of the scale were determined as 0.89 for scheduling, 0.78 for evaluation, 0.77 for leisure attitude and 0.75 for goal setting, respectively.

Data Collection and Analysis

Data has been collected from university students via electronic forms prepared in Google forms, due to the fact that all universities in Turkey have switched to online education for the duration of the 2019-2020 global pandemic. Links of the electronic form have been shared with instructors in four Turkish universities and their help was asked in administering the form to their students at the end of their online classes. Data was collected from voluntary participants during a two-month period in October and November. Data collection procedure lasted approximately 10 to 15 minutes for each participant.

Several considerations have been made for the purpose of evaluating whether certain assumptions of various statistical tests have been met. First of all, normal distribution of data has been investigated in score sets of both SA-S and FTM-S. Skewness and kurtosis values for score set have been observed to range between -1,96 and +1,96, hence the assumption of normal distribution for each data set has been considered to be met (Tabachnick ve Fidell,2007). Therefore, the parametric statistical test of Pearson's correlation has been chosen to investigate the relationship between SA-S and FTM-S scores. Descriptive statistics for score sets from SA-S and FTM-S have been shown in Table 2.

Table 2. Kurtosis - Skewness values of the scales

Scales	N	Mean	Std. Error	Skewness	Kurtosis
SA-S	591	2,42	,775	,412	-,457
FTM-S	591	3,38	,757	-,039	-,560

In order to understand whether smartphone addiction risk is explained by score attained in the free time management scale or its sub-dimensions, a stepwise regression statistical test has been considered. An evaluation of test assumptions has revealed tolerance values greater than 0,10 (Tolerance=1,00; 0,997; 0,997) and VIF values smaller than 10, indicating there was no multicollinearity (Pallant, 2015). Durbin-Watson value of 1,760 has also shown that auto-correlation was not present, fulfilling assumptions for the stepwise regression test.

Results

Overall Levels of Smartphone Addiction and Free Time Management Skills in University Students

Descriptive statistics reveal that overall smartphone addiction risk levels in the study group is $\bar{X}=2,43$, whereas free time management scale average score is $\bar{X}=3,38$. Further information regarding scores attained in scales and their respective sub-dimensions has been shown in Table 3.

The Relationship Between Free Time Management Skills and Smartphone Addiction in University Students

Correlation tests between scores from FTM-S and SA-S, reveals a weak-level statistically significant negative correlation ($r=-,176$, $p<,01$) between smartphone addiction risk and free-time management skills. Further analyses investigating correlation between scores in the sub dimensions (Scheduling, Leisure Attitude,

Evaluation and Goal Setting) of the FTM-S and SA-S show a moderate-level statistically significant negative correlation between scheduling and smartphone addiction risk ($r=-,390$, $p<,01$). Other statistically significant correlations albeit at weak-levels have been shown to exist between smartphone addiction risk and the free time management sub dimensions of Evaluation ($r=-,091$, $p<,05$) and Goal Setting ($r=-,148$, $p<,01$). Lastly, a weak-level statistically significant positive correlation has been found between Leisure Attitude and smartphone addiction risk ($r=,112$, $p<,01$). Table 4 displays all results of the correlation tests in the matrix form.

Table 3. Descriptive statistics on scores attained in SA-S and FTM-S scales and their respective sub-dimensions

	Min.	Max	Avg.	SD
SA-S	1,03	4,58	2,43	,775
Daily-Life Disturbance	1	6	2,85	1,117
Positive Anticipation	1	6	2,66	1,050
Withdrawal	1	5,71	1,97	,963
Cyberspace-oriented Relationship	1	5,75	1,58	,893
Overuse	1	5,50	2,64	1,098
Social Media Addiction	1	6	2,51	1,359
Physical Symptoms	1	6	2,78	1,011
FTM-S	1,27	5,00	3,38	,757
Scheduling	1,00	5,00	3,57	,953
Leisure Attitude	1,00	5,00	3,94	,974
Evaluation	1,00	5,00	3,18	1,037
Goal Setting	1,00	5,00	3,10	1,048

Table 4. Correlation matrix showing relationships between SA-S and FTM-S (and its sub dimensions)

	SA-S	FTM-S	Scheduling	Leisure Attitude	Evaluation	Goal Setting
SA-S	1	-,176**	-,390**	,112**	-,091*	-,148**
FTM-S		1	,601**	,446**	,733**	,715**
Scheduling			1	,053	,323**	,447**
Leisure Attitude				1	,272**	,183**
Evaluation					1	,738**
Goal Setting						1

* $p<,05$

Predicting Smartphone Addiction Risk with Free Time Management Skills

Stepwise regression tests have been carried out in order to understand whether FTM-S overall or sub dimension scores may help predict SA-S scores. Results have shown that Scheduling and Leisure Attitude sub dimensions of Free Time Management are statistically significant predictors of Smartphone Addiction Risk, whereas Evaluation and Goal Setting sub dimensions have been found to be insignificant and thus removed from the regression model. According to the model, Scheduling and Leisure Attitude sub dimension scores in FTM-S account for 16.9% of the variance in SA-S scores; with Scheduling being a negative and Leisure Attitude being a positive predictor. Table 5 shows results of the stepwise regression test.

Table 5. Stepwise regression test for predicting smartphone addiction by free time management

	B	Std.Error	Beta	t	Tolerance	VIF
Model 1 (Constant)	3,560	,114		31,215**		
Scheduling	-,317	,031	-,390	-10,269**	1,000	1,000
Model 2 (Constant)	3,163	,159		19,856**		
Scheduling	-,323	,031	-,397	-10,541**	,997	1,003
Leisure Attitude	,106	,030	,133	3,535**	,997	1,003

Model 1 = $r: 390$, $R^2: ,152$, $F(2,588): 105,443$, $p < .01$.

Model 2 = $r: 412$, $R^2: ,169$, $F(2,588): 12,499$, $p < .01$

* $p<,05$; ** $p<,01$. Durbin-Watson=1,760.

Discussion and Conclusion

This study investigates the relationship between free time management skills and smartphone addiction risk in university students. A glance at the literature shows that the notion of free-time and personal traits associated with it, such as free-time satisfaction or management have not been evaluated within the context of technological addictions. In one study however, Yaman (2020) investigates addiction to the social networking service of Facebook and free-time satisfaction in university students; and reports no relationship between Facebook addiction risk and one's satisfaction with how one spends free time. This finding needs to be interpreted however, under the light of the fact that the Facebook social network is not as popular as it used to be among the younger generation (Hong & Oh, 2020).

In this study, findings of overall smartphone addiction risk in the study group have shown that smartphone addiction risk in university students may be considered low. Similar results have been achieved by Sağıroğlu and Akkanat (2019), who have studied 200 high school students and found similarly low scores in terms of smartphone addiction risk. Aktan (2018) reports another similar finding, indicating that overall social media addiction condition of university students may be explained as a "low level of addiction". However, contradictory results also exist in the literature reporting moderate (Haug et al., 2015; Çalışkan et al., 2017; Fazla et al., 2019; Akyürek, 2020) and high (Bianchi & Phillips, 2005; Minaz & Bozkurt, 2017; Kwon et al., 2013) overall levels of smartphone addiction risk in university students. Collectively, these contradicting findings may perhaps indicate that smartphone addiction levels vary as influenced by different factors such as socio-economic structure, culture, age group at regional and international levels.

The study also reflects a negative relationship between smartphone addiction risk and free time management skills in university students. In other words, as far as university students are concerned, as failure to manage one's free time increases, so does one's risk of developing an addiction to smartphone use. Yeşildal and Üstünbaş (2019) have reported similar results in a study they have conducted with 298 university students in another type of addiction; showcasing weak yet statistically significant negative correlation between free time management and risk of addiction to social media. Another study conducted with 165 university students in a school of nursing, which investigated the relationship between free time management and internet addiction, has also shown a moderate-level statistically significant negative correlation between the variables (Eroğlu & Kutlu, 2020). In Fazla et al.'s (2019) study, the choice of reading as a leisure activity has been shown to be associated with a decreased level of smartphone addiction risk in university students. Lastly, Wang (2019) reports that better skill in managing one's free time helps reduce boredom in university students and that boredom, in turn, translates into higher risk of internet addiction. It can be claimed that better skill in free time management, which may be interpreted in individual's active or passive participation in relaxing and/or productive activities that help maintain progressive development and inner peace, is one of the important elements in the struggle against addiction to information technology products.

Free-time management skill may be broken down into its sub-skills. The investigation of the relationship of these sub-skills with smartphone addiction in this study has also produced meaningful results. The "Scheduling" sub-skill of free-time management has been shown to be negatively correlated at a moderate-level with smartphone addiction risk; whereas "Evaluation" and "Goal Setting" also seem to have weak-level negative correlations with the latter. These findings may indicate that those university students who are unable to set well-defined goals for themselves, arrange their free time into an organized schedule or successfully evaluate the notion of free time may carry higher risk of smartphone addiction. On the other hand, as far as leisure attitude scores are concerned, the correlation with smartphone addiction risk seems to be positive.

University students may be considered as a group of individuals that have the freedom to decide and plan out when their free time begins and how to use that free time (Wang et al., 2012). That said, many undergraduate students have been reported to mismanage their free time and encounter feelings of boredom, which lead to behavioral problems like internet addiction (Wang, 2019). In Selçuk's (2019) study, it has been demonstrated that difficult in managing one's free time is associated with poor skills in self-regulation and that feelings of boredom coinciding with one's leisure time bolsters social media addiction risk. Sun and Kawthur (2013) indicate that university students commonly report "lack of time", "having to study all the time" and "lack of motivation" as reasons for being unable to manage their free time well. Lastly, it has also been reported in a study, which emphasizes not only the preventive but also the remedial aspect of free time management, that successful management of one's free time is an important element in overcoming internet addiction and that constructive use of free time helps reduce time spent using the internet by increasing face to face social contact (Van Rooij et al., 2012).

In the last part of the study, the predictive quality of free-time management skill and its sub-skills in determining smartphone addiction risk have been evaluated. Regression tests have shown that a model consisting of Scheduling and Leisure Attitude sub-skills predicted 16,9% of variance in smartphone addiction risk. In addition, the strongest predictor of smartphone addiction risk seems to be the scheduling sub-skill with 15,2% of variance explained. These findings may be interpreted as poor scheduling of one's free time in university students leading to smartphone addiction risk. That said, leisure attitude also predicts smartphone addiction risk, albeit minimally and in the opposite direction. A study by Kaya (2015) reveals that individuals engaging in physical activities during their leisure time display significantly more positive leisure attitude than those who don't. Interestingly enough, Kaya's paper also reports that positive leisure attitude is also associated with higher smartphone addiction risk; confirming the positive prediction of smartphone addiction risk by leisure attitude discovered in this study.

Recommendations

A meta-analysis that covers randomized control trials measuring the effectiveness of psychological interventions targeting adolescents for recovery from smartphone or internet addiction revealed that; educational programming or sandplay therapy are effective methods on reducing addiction severity (Malinauskas & Malinauskiene, 2019). Whereas, another meta-analysis research has shown that sports and physical exercise are effective methods in treating smartphone addiction, especially for those with a severe level of addiction (Liu et al., 2019). An interesting finding from research conducted in Malaysia however, indicates that as far as university students are concerned, maintaining an active physical life also helps reduce risk of smartphone addiction, only insofar as the addiction is caused by excessive mobile gaming related use (Abbasi et al., 2021). The same study reports that the same cannot be said for entertainment-related or social-network-related excessive use; i.e. no matter the level of physical activity in daily life, a person may still be smartphone addicted due to depending on the device for entertainment or social interaction.

In the end, it could be said that as far as university students are concerned, smart and purposeful scheduling of one's leisure time leads to reduced risk of smartphone addiction. And yet, it should be noted that free-time management is not synonymous with simply "staying away from the smartphone" through various lifestyle changes such as increasing the daily amount of physical activity. A study has showcased the inclusion of a course on free time management into the college curriculum has positively influenced students, enabling them to better organize their free time and turn boring situations into stimulating experiences (Caldwell et al., 2004). Tükel has also investigated the relationship between smartphone addiction and leisure satisfaction in 855 university students, showcasing that these variables are negatively correlated; also remarking that participation in athletic but also cultural or social activities was also positively associated with leisure satisfaction. However, it is known that today, university students mainly resort to electronic devices and most especially Internet use for spending their free time (Minaz & Bozkurt, 2017). Failure to manage free time well by choosing and engaging in proper recreational activities may therefore end up with one's free time being spent entirely on smartphones, the Internet, social media or digital games with a risk of addiction. Such overuse or addiction may in turn, lead to time loss, disruptions in daily routine, mental stress or even deterioration of physical health (Yeşildal & Üstünbaş, 2019). In this sense, the findings of this here study may be beneficial to the academic literature, in that, importance of free time management skills in university students has once again been emphasized. Literature also suggests that starting from adolescence; parents and educational institutions need to support students in terms of free time management and participation in leisure activities (Aksoy, 2018; Bulduklu & Özer, 2016; Sun & Kawthur, 2013). Lastly, it should be considered that efficient and active use of free time translates not only into physical and mental health improvement for university students (Arı, 2017; Macan, 1990; Alay & Koçak, 2003) but also into social, cultural and career development potential.

The Relationship Between Free Time Management Skills and Smartphone Addiction in University Students

Correlation tests between scores from FTM-S and SA-S, reveals a weak-level statistically significant negative correlation ($r=-,176$, $p<,01$) between smartphone addiction risk and free-time management skills. Further analyses investigating correlation between scores in the sub dimensions (Scheduling, Leisure Attitude, Evaluation and Goal Setting) of the FTM-S and SA-S show a moderate-level statistically significant negative correlation between scheduling and smartphone addiction risk ($r=-,390$, $p<,01$). Other statistically significant correlations albeit at weak-levels have been shown to exist between smartphone addiction risk and the free time management sub dimensions of Evaluation ($r=-,091$, $p<,05$) and Goal Setting ($r=-,148$, $p<,01$). Lastly, a weak-

level statistically significant positive correlation has been found between Leisure Attitude and smartphone addiction risk ($r=.112, p<.01$). Table 4 displays all results of the correlation tests in the matrix form.

Limitations

This study followed a convenience sampling method in the inclusion of participants from three Turkish state universities to represent an entire population of Turkish undergraduate university students. As such, disproportionate amount of members has been included in many demographic categories such as gender or study year. Advanced sampling methods, such as quota sampling, could have served to represent the population more accurately. Being an introductory study in investigating relationship between free-time management and smartphone addiction; it also employed rudimentary statistical methods for explaining the relationship between variables, partly due to violation of assumptions for more advanced techniques, such as structural equation modeling. Future studies may improve upon these findings by employing such tests for analysis. Moreover, qualitative research methods, which were omitted in this study, may also have been useful for maintaining a deeper investigation of how exactly those scoring higher in the free-time management scale spend their free-time as opposed to those who score lower.

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Scientific Ethics Declaration

The authors declare that the scientific ethical and legal responsibility of this article published in JESEH journal belongs to the authors.

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