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The Mediating Role of Leisure Time Management in the Relationship Between Smartphone and Digital Game Addiction Among Adolescents

Ergenlerde Akıllı Telefon Bağımlılığı, Dijital Oyun Bağımlılığı ve Boş Zaman Yönetimi: Aracılık Rol Analizi

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Abstract

The primary purpose of this research is to examine whether smartphone addiction and digital game addiction have a positive impact on adolescents' leisure time management, and whether leisure time management functions serving as an intermediary variable in the link between smartphone addiction and digital game addiction. This research was carried out with the quantitative research method based on the relational research design from the relational screening model. A total of 594 high school students (388 females, 206 males) enrolled in secondary education took part voluntarily in the survey conducted in the city of Isparta. The Personal Information Form, Smartphone Addiction Scale, Digital Game Addiction Scale, and Leisure Time Management Scale were used to gather the required data. PROCESS Macro v3.3, was employed Model 4 with 5,000 bootstrap resamples at a 95% confidence level. The findings of the survey demonstrated that smartphone addiction exerted a statistically important influence on both leisure time management and digital game addiction among high school student. While smartphone addiction had a small positive effect on leisure time management, it had a strong positive and statistically significant influence on digital gaming addictions. Moreover, leisure time management was known to have a significant negative impact on digital game addiction. However, leisure time management did not have an important interceding role on connection between smartphone and digital game addiction. These results provide important insights into the effects of digital addictions on adolescents' leisure behaviors.

Key Words: Adolescents, Addiction, Smartphone, Leisure Time Management, Digital Games

Öz

Bu çalışma, ergenlerin akıllı telefon ve dijital oyun bağımlılıkları ile boş zamanlarını yönetme biçimleri arasındaki karmaşık ilişkiyi merkeze almaktadır. Araştırmanın temel amacı, akıllı telefon bağımlılığının boş zaman yönetimi ve dijital oyun bağımlılığını ne yönde etkilediğini saptamak ve özel olarak boş zaman yönetiminin, akıllı telefon bağımlılığından dijital oyun bağımlılığına uzanan süreçte bir aracı değişken olup olmadığını test etmektir. İlişkisel tarama modeline dayalı nicel bir yaklaşımla yürütülen bu araştırmaya, Isparta ilindeki liselerde öğrenim gören 388'i kadın ve 206'sı erkek olmak üzere toplam 594 öğrenci gönüllülük esasına göre katılmıştır. Veri toplama sürecinde Kişisel Bilgi Formu, Akıllı Telefon Bağımlılığı Ölçeği, Dijital Oyun Bağımlılığı Ölçeği ve Boş Zaman Yönetimi Ölçeği'nden yararlanılmıştır. Verilerin analizi, %95 güven aralığında 5000 bootstrap örneklemli PROCESS Macro v3.3 (Model 4) aracılığıyla yapılmıştır. Araştırma bulguları, akıllı telefon bağımlılığının hem boş zaman yönetimi hem de dijital oyun bağımlılığı üzerinde istatistiksel olarak anlamlı bir etkiye sahip olduğunu ortaya koymuştur. Akıllı telefon bağımlılığının boş zaman yönetimi üzerinde zayıf ve pozitif bir etki yaratırken, dijital oyun bağımlılığını ise güçlü ve pozitif yönde anlamlı biçimde yordadığı görülmüştür. Ayrıca, boş zaman yönetimi becerisinin dijital oyun bağımlılığını negatif yönde etkilediği saptanmıştır. Bununla birlikte, çalışmanın temel varsayımlarından biri olan boş zaman yönetiminin, akıllı telefon ve dijital oyun bağımlılığı arasındaki bağlantıda istatistiksel olarak anlamlı bir aracılık rolü üstlenmediği sonucuna varılmıştır. Bu sonuçlar, dijital bağımlılıkların ergenlerin boş zaman alışkanlıkları üzerindeki çok yönlü etkilerini anlamak adına önemli veriler sunmaktadır.

Anahtar Kelimeler: Ergenler, Bağımlılık, Akıllı Telefon, Boş Zaman Yöneyimi, Dijtal Oyunlar

1. INTRODUCTION

The rapid development and widespread use of digital technologies have led to profound changes in the lifestyles of young individuals, particularly adolescents**.** Smartphones have become indispensable tools in daily life, serving as essential instruments for social interaction, entertainment, access to information, and leisure activities (Kuss & Griffiths, 2017). However, excessive and uncontrolled use of these devices may give rise to forms of addiction that can eventually lead to psychological, social, and behavioral problems (Hawi & Samaha, 2016). Smartphone addiction is characterized by difficulty in controlling smartphone use, increasing usage duration over time, and the negative impact of this usage on an individual's social, academic, or personal life (Üzgü et al.,2023; Lee et al., 2014). Studies have shown that smartphone addiction in adolescents is associated with a variety of negative outcomes, including attention deficits, sleep disturbances, decreased academic performance, and social isolation (Elhai et al., 2017). This form of addiction is also closely linked to other behavioral addictions, such as digital game addiction (Jeong et al., 2016).

Digital game addiction is defined by a loss of control over gaming behavior, spending an inordinate amount of time on digital gaming activities, and experiencing impairments in social, academic, or occupational functioning as a result (Pontes & Griffiths, 2015; Bozgüney & Can, 2023). Due to both developmental characteristics and their intense interaction with digital media, adolescents are considered to be at high risk for developing digital game addiction (Anderson et al., 2017). Furthermore, studies exploring the relationship between digital game addiction and smartphone addiction indicate that these two types of addiction share overlapping psychosocial risk factors (Chen et al., 2021). Within this framework, a comprehensive understanding of the development of digital addictive behaviors requires focusing not only on individuals technology usage but also on their leisure time management skills. Leisure time management refers to an individual's ability to plan, organize, and engage in structured and satisfying leisure activities (Wang et al., 2011; Bozgüney & Alp, 2025). Leisure time management, which is efficient during adolescence, plays a critical role in developing a healthy lifestyle and protecting from digital risks (Sharp et al., 2011; Çimen et al., 2023). Research suggests that individuals who are unable to manage their leisure time effectively are more likely to spend excessive time in front of screens, potentially triggering digital addictive behaviors (Keles et al., 2020).

Accordingly, the question of whether leisure time management functions operating as an intermediary variable in the association between smartphone addiction and digital game addiction gains significance. Mediation analyses reveal the pathways through which one variable influences the relationship between two others, contributing to a deeper understanding of behavioral dynamics. In this context, the present study proposes the following hypotheses:

H1: Smartphone addiction positively predicts digital game addiction.

H2: Smartphone addiction negatively predicts leisure time management.

H3: Leisure time management significantly and negatively predicts digital game addiction.

H4: Leisure time plays a role as a mediating variable between smartphone addiction and digital game addiction.

2. METHODOLOGY

Research Model

The present research was carried out utilizing a quantitative research approach and a framework based on the relational survey model. According to Karasar (2016), this model represents a survey approach that aims to detect the entity and scope associations among two or more variables.

Ethical Approval

Ethical acknowledgement for the research was attained from the Ethics Committee of the Faculty of Health Sciences at Süleyman Demirel University (Meeting No: 97, Decision No: 10).

Participants

The sample of the study was selected through the convenience sampling method which is one of the non-probability sampling techniques. The research was conducted on 594 students studying in the province of Isparta during the 2024–2025 academic year. The distribution of the students according to their characteristics is described in the following chart.

Demographic Characteristics

	Categories	n	%
Gender	Female	388	65.3%
	Male	206	34.7%
Grade Level	9th Grade	105	17.7%
	10th Grade	119	20.0%
	11th Grade	235	39.6%
	12th Grade	135	22.7%
Mother's Education	Middle School	157	26.4%
	High School	250	42.1%
	University	187	31.5%
Father's Education	Middle School	101	17.0%
	High School	234	39.4%
	University	259	43.6%
Family Income Level	Low	84	14.1%
	Medium	454	76.4%
	High	56	9.4%
Total		594	100%

The study sample consisted of 594 students. 388 of the participants were female and 206 were male. This indicates that the sample predominantly consisted of female students. When looking at grade level, the highest participation rate was observed among 11th grade students (n=235). Considering the mothers' educational background, 157 were middle school studies, 250 were high school graduated, and 187 were university graduates. Considering the fathers' education background, 101 were middle school studies, 234 were graduated from high school, and 259 were university graduates. These findings suggest that fathers generally had higher educational attainment than mothers. When examining the families' income levels, 14.1% (n = 84) of the students came from low-income families, 76.4% (n = 454) from middle-income families, and 9.4% (n = 56) from high-income families.

Data Collection Instruments

Personal Information Form:
This instrument was employed to collect demographic data including such as gender, grade level, parents' education levels, and family income level.

Smartphone Addiction Scale:

This scale was adapted into Turkish by Noyan et al. (2015). The items included in the scale are rated from "1 – Strongly disagree" to "6 – Strongly agree." The overall score derived from the scale can vary from 10 to 60.

Digital Game Addiction Scale (DGAS):

The original scale was designed by Lemmens et al. (2009), and its validity and reliability studies were conducted by Irmak and Erdoğan (2015). The original scale consisted of 21 items, while the 7-item version was used in our study. Cronbach's alpha was calculated as 0.73, RMSEA=0.012, AGFI=0.92, CFI=0.99, GFI=0.96, and SRMR=0.06. The validity and reliability findings of the 7-item Turkish version of the scale were found to be similar to the results of the original scale.

Leisure Time Management Scale (LTMS):

A scale developed by Wang et al. (2011) was used in the study. This scale was adapted into Turkish by Akgül and Karaküçük (2015), and used in its current form. Consequently the exploratory factor analysis (EFA), it was seen that the scale occur; includes 15 items and 4 sub-dimensions, explaining 61% of the total variance. The reliability of the LTMS was determined using Cronbach's alpha internal consistency coefficient and the test-retest method. The internal consistency analysis yielded a Cronbach's alpha coefficient of .83. The sub-dimensions were "Goal Setting and Technique"= .81, "Leisure Attitude"= .79, "Evaluation"= .71, and "Scheduling"= .73. These findings suggest that the scale possesses good internal consistency.

Data Analysis

Data analysis was performed with the Statistical Package for the Social Sciences (SPSS) version 29.0. Before conducting the analyses, all data were screened for missing values and response inaccuracies. Subsequently, missing data and outlier analyses were performed. As a result of these analyses, 64 outliers were identified and excluded from the dataset prior to conducting further statistical procedures. A total of 594 values were statistically analyzed. In this study, skewness and kurtosis values were calculated for descriptive data, as well as frequency, percentage and arithmetic mean analyses. Normal distribution of the data was examined within the range of +1.5 to -1.5. Based on the criteria suggested by (Büyüköztürk, 2019;Tabachnick & Fidell 2013), the data were found to be normally distributed. Therefore, parametric were conducted. To investigate the relationships among variables, Pearson correlation analysis was employed. The magnitude of the relationships was evaluated based on conventional criteria as follows: 0.00–0.30 = low, 0.30–0.70 = moderate, and 0.70 and above = high. While managing a regression analysis based on the Bootstrapping method, indirect effects have been reported on the basis of confidence interval (CI) values (Hayes) for mediation analysis.2018). In these analyses, age, gender, department, and grade level were controlled as covariates. The analyses were conducted with Model 4 of the PROCESS Macro v3.3 developed by Hayes (2018). The mediating effects were tested using 5,000 bootstrap resamples at a 95% confidence interval (CI). The importance of the mediation role was valued by checking whether the lower (BootLLCI) and upper (BootULCI) bounds of the bootstrap confidence interval did not include zero. It has been emphasized in the literature that modern approaches to mediation analysis, such as bootstrapping, yield more reliable results compared to causal approaches by Baron and Kenny (1986) and the Sobel test. This method is especially prominent because it does not require the assumption of normality, is effective with small sample sizes (n < 25), allows for control of factors that may influence relationships among variables, and minimizes Type I error rates (Preacher & Hayes, 2008; Gürbüz, 2019; Hayes, 2018).

3. FINDINGS

Table 1. Descriptive Statistics of the Variables

Variables	n	Min	Max	X	SS	Skewness	Kurtosis
Smartphone Addiction	594	1.00	5.00	2.4564	1.03275	0.484	-0.674
Digital Game Addiction	594	1.00	5.00	2.0873	0.95965	0.904	0.232
Leisure Time Management	594	1.27	3.87	2.5918	0.52342	0.158	-0.051

The participants' average score on the Smartphone Addiction Scale was $\bar{x}$ = 2.46 (SD = 1.03), with scores ranging from 1.00 to 5.00. The average score for Digital Game Addiction was $\bar{x}$ = 2.09 (SD = 0.96), indicating that participants generally had low levels of digital game addiction. Scores for Leisure Time Management ranged from 1.27 to 3.87, with a mean score of $\bar{x}$ = 2.59 (SD = 0.52). Since the skewness and kurtosis values for all variables were within the acceptable range of ±1, as suggested by George and Mallery (2010), it can be stated that the data are normally distributed.

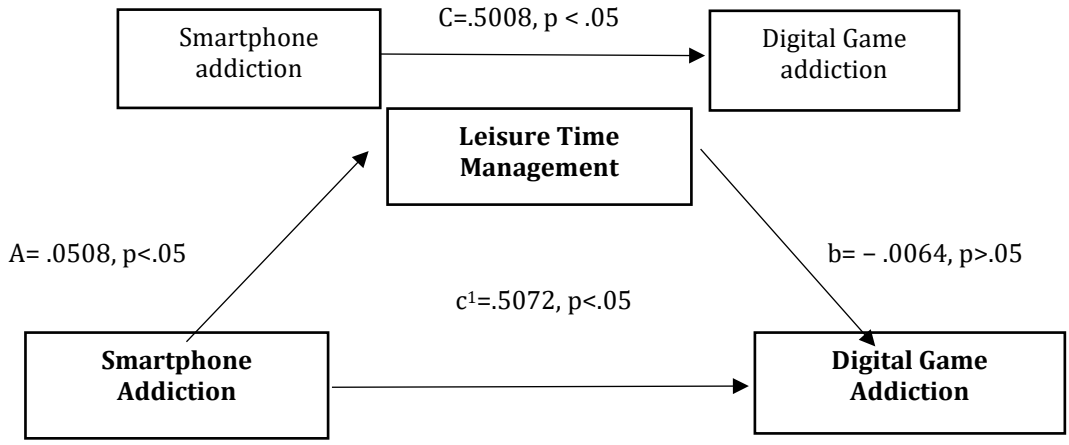
Table 2. Pearson Correlation Analysis

Variables	1	2	3
1. Smartphone Addiction	r = 1		
	p = —		
	n = 594		
2. Digital Game Addiction	r = 0.539**	1	
	p = 0.000	—	
	n = 594	594	
3. Leisure Time Management	r = 0.100*	r = -0.014	1
	p = 0.015	p = 0.729	—
	n = 594	594	594

The pearson correlation analysis revealed a statistically significant positive correlation between smartphone and digital game addiction (r = 0.539, p < 0.001). A statistically significant but weak positive correlation was observed between smartphone addiction and leisure time management. Conversely, the results indicated that leisure time management was not significantly associated with digital game addiction (r=-0,014, p=0,729). No significant relationship was found between smartphone addiction, digital game

addiction and leisure time management. Furthermore, they suggest that digital game addiction and leisure time management appear to be independent of each other.

The indirect role of leisure time management in the association between smartphone addiction and digital game addiction inter adolescents is presented in Figure 1.



Direct Effect: 15.73, p < .001, 95% CI (Preacher and Hayes, 2007)

Figure 1. Research Model

In the first model, the effect of smartphone addiction on leisure time management was examined. The model's R^2 = 0.0100 indicates that smartphone addiction explains only 1% of the variance in leisure time management, suggesting a small effect size. However, the F-test (F(1, 592) = 5.9996, p = 0.0146) shows that the overall model is statistically significant. The coefficient for smartphone addiction was β = 0.0508 (p = 0.0146), indicating that a one-unit increase in smartphone addiction leads to a 0.0508-unit increase in leisure time management. The confidence interval [0.0101, 0.0915] also supports the significance of this effect.

In the second model, the effects of smartphone addiction and leisure time management on digital game addiction were examined. The model's R^2 = 0.2952 shows that 29.5% of the variance in digital game addiction is explained by the predictors, representing a strong effect size. The F-test (F(2, 591) = 123.7509, p < 0.0001) indicates that the model is significant. Smartphone addiction had a significant positive effect (β = 0.5072, p < 0.0001), meaning each one-unit increase in smartphone addiction increases digital game addiction by 0.5072 units. Leisure time management had a significant negative effect (β = -0.1264, p = 0.0475), indicating that increases in leisure time management reduce digital game addiction. The confidence intervals [0.4439, 0.5706] and [-0.2513, -0.0014] confirm these significant effects.

In the total effect model, smartphone addiction had a significant positive total effect on digital game addiction (β = 0.5008, p < 0.0001). The direct effect remained significant (β = 0.5072, p < 0.0001) and was slightly larger than the total effect. The indirect effect via leisure time management was β = -0.0064, and the bootstrapped confidence interval crossed zero, indicating no significant mediation. Therefore, leisure time management does not mediate the relationship between smartphone addiction and digital game addiction.

Finally, the bootstrap confidence interval analyses confirmed the significance of the individual paths. The effect of smartphone addiction on leisure time management was significant (β = 0.0508, CI [0.0077, 0.0921]). The effect of smartphone addiction on digital game addiction was also significant (β = 0.5072, CI [0.4297, 0.5812]). The effect of leisure time management on digital game addiction was β = -0.1264 with a confidence interval [-0.2532, 0.0003]. Because this interval includes zero, this path is not statistically significant in the bootstrap estimation, further supporting the conclusion that the indirect effect is not significant.

4. DISCUSSION

This section discusses the analyses conducted in line with the primary objective of the study. In regard to the findings of the conducted correlation analysis, there is a significant and positive relationship between smartphone addiction and digital game addiction. When reviewing the literature, there are many studies showing the existence of a relationship between smartphone addiction and digital game addiction. These studies show that the two addictions have a mutually reinforcing and complementary effect. Przybylski and Weinstein (2017) stated that excessive use of smartphones is associated with other screen activities such as digital games. Continuous interaction with smartphones creates an environment that facilitates the development of other addictions like digital game addiction. Especially among adolescents, it has been emphasized that there is a common psychological basis between smartphone and digital game addiction. Similarly, Kuss and Griffiths (2012), in their study on digital game addiction, indicated that smartphone and digital game addiction share similar characteristics. Both types of addiction feed the need for instant gratification and social interaction. The study highlighted that increased smartphone use could also increase digital game addiction. Lemola et al. (2015) observed that digital media use (including smartphones and digital games) among adolescents is mutually reinforcing. The research revealed that smartphone addiction increases digital game playing time and this in turn strengthens digital game addiction. This finding suggests that digital media consumption leads to complementary addictions among young people.

Hou et al. (2017) demonstrated the existence of a between smartphone addiction and digital game addiction and stated that this relationship is positive. Their study showed that young people's constant use of smartphones increases the time spent playing digital games, thereby reinforcing digital game addiction. Smartphones have become the primary platform for youths to interact with digital games. Choi et al. (2015) stated that smartphone use increases digital game playing time among adolescents. Their research provided definitive evidence that smartphone addiction increases digital game addiction. Smartphones function as a facilitator that feeds that amplifies adolescents' dependency on digital games. In conclusion, the literature strongly supports that smartphone addiction has a positive and significant effect on digital game addiction among adolescents. This relationship indicates that smartphone use plays an important role in increasing digital game addiction, especially in young individuals.

Empirical evidence from this study showed the strong and positive effect of smartphone addiction on digital game addiction. According to the correlation calculus findings, there is a significant relationship between smartphone addiction and digital game addiction ($r = 0.539$, $p < 0.001$). This outcome is consistent with other studies in the literature. Przybylski and Weinstein (2017) noted that inordinate use of smartphones is related to other screen-based activities like digital games. Similarly, Kuss and Griffiths (2012) emphasized that smartphone addiction could increase digital game addiction. Our study aligns with this literature and shows that smartphone addiction is a factor that increases digital game addiction.

On the other hand, the effect of smartphone addiction on leisure time management was also examined. In the first model, smartphone addiction had a significant but low-level effect on leisure time management. This indicates that smartphone addiction may partially affect how adolescents manage their leisure time. However, no significant relationship was determined between leisure time management and digital game addiction. This result shows that leisure time management does not have an indirect effect on digital game addiction. The research by Kuss and Griffiths (2012) supports previous studies.

In the second model, leisure time management was proved to have a negative impact on screen addictions. This finding suggests that improving leisure time management could reduce digital game addiction. While Lemola et al. (2015) noted that digital media use among youths is mutually reinforcing, this study proposes that the effect of digital game addiction may be limited by enhancing leisure time management. In other words, adolescents managing their leisure time more efficiently could potentially reduce digital game addiction. However, our study found that leisure time management did not play a significant mediating role in the effect of smartphone addiction on digital game addiction ($\beta = -0.0064$, $p > 0.05$). According to the findings, leisure time management does not have an indirect impact on the connection between smartphone and screen addiction. The literature also indicates that this relationship occurs through a direct interaction (Lemola et al., 2015). This finding strengthens the view that smartphone addiction directly increases digital game addiction.

In conclusion, our findings reveal that smartphone addiction has a reinforcing and positive effect on digital game addiction, while leisure time management has a reducing impact on screen addictions. This supports the existing literature indicating that smartphone use is a factor that strengthens digital game addiction, especially among adolescents. However, it can be concluded that more research is needed to understand the relationship between leisure time management and digital game addiction.

Based on the research findings, the following recommendations can be made: Our research clearly demonstrates that leisure time management skills play a key role in preventing digital game addiction. Encouraging young people to engage in planned activities, particularly sports and social events, rather than spending their time aimlessly, acts as an important shield protecting them from the pitfalls of the digital world. Therefore, it is an urgent need for educational institutions to include practical programs in their curricula that will help students develop these life skills.

Our findings also confirm that smartphone addiction acts as a gateway to digital game addiction. This underscores the role of families and teachers in digital supervision. Rather than simply monitoring the time young people spend in front of screens and the content they consume, organizing activities that foster conscious awareness through healthy communication with them will yield more lasting solutions.

5. LIMITATIONS AND RECOMMENDATIONS

- It is thought that increasing sports, arts, and social activities in schools could be beneficial in helping students spend their free time more productively. Such activities can naturally reduce screen time.
- School counseling services should provide timely digital addiction counseling and early screening interventions. Therefore, it is thought that early interventions will be available for individuals in higher risk groups.
- Since a cross-sectional research model was used in this study, it is not possible to conclude what changes in the temporal direction the relationships between the variables may reveal. Therefore, it is thought that longitudinal studies in future work may reveal the long-term effects of digital addiction in a more realistic way.
- Additionally, different cultural backgrounds and income levels may provide an important opportunity to examine and evaluate the universality of the current findings and to test the conditions under which the results may be valid.
- Since the sample in this study was determined in only one province of Turkey (Isparta), its diversity is quite limited. Therefore, it is recommended that future studies be conducted in different regions.

In conclusion, the findings of this study show that digital addiction is not only related to technology use but also to young people's leisure activities. Therefore, families, educators, and policymakers need to take important steps to ensure that young people lead more balanced and healthy lives.

6. CONFLICT OF INTEREST AND ETHICS COMMITTEE APPROVAL

Conflict of interest: *There isn't conflict of interest among the authors.*

Financial support: *There isn't financial support was reported by the authors.*

Ethics Approval: *The authors declare that the article complies with national and international research and publication ethics. In case of a contrary situation, the* ***Journal of Sport and Recreation Research*** *has no responsibility, and all responsibility belongs to the authors of the article.*

Ethics Committee Approval: *This study was approved by the Health Sciences Ethics Committee of Süleyman Demirel University. (Date: 28-05-2025, Decision No: 10, Meeting No: 97).*

Informed Consent: *Informed consent was obtained for the voluntary participation of the participants.*

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