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THE EFFECT OF DIGITAL GAME ADDICTION ON AGGRESSION IN SCHOOLAGE CHILDREN

OKUL ÇAĞI ÇOCUKLARDA DİJİTAL OYUN BAĞIMLILIĞININ SALDIRGANLIK ÜZERİNE ETKİSİ

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ABSTRACT

Objective: This study was conducted to determine the impact of digital game addiction on aggression in school-age children.

Method: This descriptive and cross-sectional study was conducted in January-June 2023 with children aged 10-11 years studying in secondary schools in Batman. The study was completed with 300 children who met the research criteria. Data were collected by distributing the questionnaire form, Digital Game Addiction Scale for Children and Aggression Scale to the children whose parental consent was obtained in a time period that would not disrupt the class hours. In the evaluation of the data; percentages, averages, t test, Anova, Bonferonni, Pearson Correlation analyzes were used.

Results: It was determined that 52% of the students participating in the study were male and 57.3% were 11 years old. The digital game addictions and aggression of male students, those whose mothers and fathers are civil servants, those who have a tablet/computer/phone, those who play games for 4 hours or more a day with a tablet/computer/phone, and those who mostly prefer computers to play games are statistically significant. There was a significant positive correlation between children's digital game addiction and aggression (p<0.05).

Conclusion: It was determined that as students' digital game addiction levels increased, their aggression levels increased. In addition, as the daily playing time of the students increased, their digital game addiction and aggression levels also increased.

Key Words: Addiction, Child, Digital game, Aggression

ÖZ

Amaç: Bu araştırma okul çağı çocuklarda dijital oyun bağımlılığının saldırganlık üzerine etkisini belirlemek amacıyla yapıldı.

Yöntem: Tanımlayıcı ve kesitsel yapılan bu araştırma, Ocak-Haziran 2023 tarihinde Batman'da bulunan ortaokullarda eğitim gören 10-11 yaş grubu çocuklarla yapıldı. Araştırma kriterine uyan 300 çocuk ile araştırma tamamlandı. Ebeveyn onamları alınan çocuklara ders saatini aksatmayacak bir zaman diliminde anket formu, Çocuklar için Dijital Oyun Bağımlılık Ölçeği ve Saldırganlık Ölçeği dağıtılarak veriler toplandı. Verilerin değerlendirilmesinde; yüzdelik, ortalamalar, t testi, Anova, Bonferonni, Pearson Korelasyon analizlerinden yararlanıldı.

Bulgular: Araştırmaya katılan öğrencilerin %52'sinin cinsiyetinin erkek ve %57.3'ünün 11 yaşında olduğu belirlendi. Erkek öğrencilerin annesi ve babası memur olanların, tableti/bilgisayarı/telefonu olanların, tablet/bilgisayar/telefon ile günlük 4 saat ve üstü oyun oynayanların ve oyun oynamak için en çok bilgisayarı tercih edenlerin dijital oyun bağımlılıkları ve saldırganlıkları istatistiksel olarak anlamlıydı. Çocukların dijital oyun bağımlılıkları ile saldırganlıkları arasında pozitif yönde anlamlı bir ilişki olduğu bulundu (p<0.05).

Sonuç: Öğrencilerin dijital oyun bağımlılık düzeyleri arttıkça saldırganlık düzeylerinin arttığı belirlendi. Ayrıca öğrencilerin günlük oynadığı oyun süresi arttıkça dijital oyun bağımlılıkları ve saldırganlık düzeyleri de artmaktadır.

Anahtar Kelimeler: Bağımlılık, Çocuk, Dijital oyun, Saldırganlık

INTRODUCTION

With the developing technology, it is an indispensable part of human life and brings many new practices [1]. According to TUIK 2021 data, internet usage for children in the 6-15 age group was 50.8% in 2013 and 82.7% in 2021. When internet usage is analyzed by gender, it is seen that the internet usage rate of boys, which was 53.7% in 2013, increased to 83.9% in 2021, while the internet usage rate of girls, which was 47.8% in 2013, increased to 81.5% in 2021 [2]. Internet use shapes many basic areas of life, from education to health, transportation, communication and entertainment [3].

At one step of this shaping; game behavior, which started with imitating some natural events, has gained a different dimension with imaginary games (digital games) played with special computer software and game tools. It is a known fact that this developing technology, along with the practices it has brought to human life, has also led to some negative consequences. One of the most important of these problems is technology addiction. Although technology addiction is a subject that is evaluated in a wide range, one of the most prominent topics is computer addiction and "digital game addiction", which is evaluated under this title [3].

Again, according to TUIK 2021 data; 36.0% of children play digital games, while this rate is 32.7% among children in the 6-10 age group and 39.4% among children in the 11-15 age group. When the rate of playing digital games is analyzed by gender and age group; while the rate of playing digital games of boys in the 6-15 age group is 46.1%, the rate of playing digital games of girls is 25.4% [2].

These games, which are programmed with various software and use various technologies, are also classified as digital console games, computer games and online games according to the technology used [4]. When the effects of digital games on children's developmental areas are evaluated in general; especially in terms of contribution to cognitive development, they have positive contributions such as strategic thinking, fast and accurate decision making, problem solving, and learning the use of technology [5-10]. One of the most important criticisms of digital games is that they cause addiction and negatively affect children mentally, physically, socially and morally [11]. It is known that violent games that are not played in a controlled manner threaten mental health. Biologically, these resulting effects cause disorders such as regression in developmental stages, eye diseases, weight loss or excessive weight gain, and impairment in the appearance of hands, shoulders, spine and psychomotor skills due to constant sitting [12,13]. In particular, violent games cause children to internalize the feeling of violence and aggression and normalize this feeling over time, leading to the upbringing of individuals prone to violence and aggression [6,11,14-16]. In the literature, it is emphasized that the most important negative effects of digital games are violence, aggression and addiction [13,17-19].

Aggression is, in general, behaviors carried out by a person or a group with the aim of harming another person [18]. A large number of games that digitize and reconstruct the children's world, while fulfilling useful functions as a means of leisure time evaluation, to relieve fatigue and stress, can also make aggression a normal behavior by containing elements of violence [17]. Especially in violent games based on winning/losing, children are often defeated, and the more they are defeated, the more ambitious they become, and this can lead to more anger and aggressive behavior [20]. In the literature, Kars (2010) concluded in a study that anti-social aggression increases as the time spent playing computer games increases [21]. Koçak and Köse (2014) stated in their study that computer games negatively affect the family, school and friendship relations of adolescents and thus the socialization process of adolescents [22]. According to Torun, Akçay, and Çolaklar (2015), the types of games played or the child's level of addiction to games may cause the child to exhibit negative attitudes towards himself and his environment [11]. Therefore, this research was conducted to determine the impact of digital game addiction on aggression in school-age children as a situation assessment and addresses the gap to determine the link between digital game playing and aggression in the transitions from middle childhood to early adolescence and from early adolescence to adolescence.

METHOD

Study Design

This research was conducted in a descriptive and cross-sectional manner over a period of time, through a section taken from the research population, to detect and describe the situation at the time of the research [23].

Participants

The population of the study consisted of 10-11 year old children studying in secondary schools in Batman in January-June 2023. The sample of the study was selected through random sampling. It was calculated using the standard deviation value (SD=16.72) of the digital game addiction scale found in the study conducted by Bircan and Öner in 2022 [24] and the formula $n=(zxSD/d)^2$ [25] in cases where the study population is unknown. In the formula, 95% confidence level and deviation d=2 were accepted and $n=(1.96x16.72/2)^2=265.69=267$. The

study was completed with 300 students who volunteered to participate in the study on the specified dates.

Inclusion Criteria:

- Studying in secondary schools in the 10-11 age group,
- Volunteering to participate in the research,

Exclusion Criteria:

- Being a diagnosed mainstreaming student.

Outcome Measures

Questionnaire Form: This form, prepared by the researcher, includes questions about children's socio-demographic characteristics such as age, class, mother and father occupation, family income status, and digital game playing characteristics [3,26,27].

Digital Game Addiction Scale for Children (CDGAS): The scale was developed by Hazar et al. (2017) [3]. It consists of 24 items and 4 sub-dimensions. These sub-factors are named as "excessive focus and conflict towards playing digital games", "development of tolerance during game time and the value attributed to the game", "postponement of individual and social tasks/assignments", "psychological-physiological reflection of deprivation and immersion in the game". It includes statements such as "Playing digital games relaxes me when I am unhappy" and "I do not realize that I am hungry while playing digital games." A 5-point Likert-type scale was used to evaluate the statements in the scale (1=Strongly Disagree, 2=Disagree, 3=Disagree, 4=Agree, 5=Strongly Agree). The lowest score that can be obtained from the scale is "24" and the highest score is "120". In the scoring of the scale; "1-24: Normal group, 25-48: Low risk group, 49-72 Risky group, 73-96 Dependent group, 97-120 Highly dependent group". The Cronbach Alpha value for the total scale was 0.90, 0.78 for the first sub-factor, 0.81 for the second sub-factor, 0.76 for the third sub-factor and .67 for the fourth sub-factor [3]. In this study, it was found to be 0.95.

Aggression Scale (SA): This scale was prepared by Şahin in 2004 after a validity and reliability study. It was aimed to develop an "Aggression Scale" based on Social Learning and Cognitive Theory in order to determine the aggression levels of 10-11 year old children at the first level of primary education. The Cronbach's alpha coefficient of the scale was found to be 0.77. The correlation coefficient of the scale was calculated as 0.71 (p<.01). The calculated validity and reliability scores show that the scale can be used to determine the aggression levels of children aged 10-11 years. In the scale consisting of eighteen items, behaviors related to aggression were given and they were asked to answer as "I always do it", "I do it sometimes", "I never do it". 5,7,10,15,17 on the scale. The items were written as neutral items and were not included in the scoring. Accordingly, a minimum of 13 and a maximum of 39 points can be obtained from the scale. The cut-off point of the scale is one standard deviation above the mean of the group, and those who score above this value are defined as aggressive. Those who score one standard deviation above this mean, 23 or more, are defined as aggressive. "Sometimes I hurt my friends on purpose." and "When the things I want are not done, I will hit and break anything I can get my hands on." [26]. In this study, Cronbach's alpha coefficient was 0.80.

Data Collection

After ethics committee permission and school permission were obtained, the study was conducted between January and March 2023 with children in the age group of 10-11 years studying in secondary schools in the provinces and districts. Before starting to collect the research data, the children were met in line with the inclusion criteria, informed about the research topic, and a consent form was sent to the families for their written consent. Then, the forms were distributed to the consenting students in a time period determined by the classroom teachers, and they were asked to fill out the questionnaire forms by explaining all the parts they did not understand. The questionnaires

were collected by face-to-face interview technique. It took approximately 15-20 minutes to complete the questionnaires.

Ethical Approval

In order to conduct the study, ethics committee permission (12/06-30.12.2022) was obtained from the Human Research Health and Sports Sciences Ethics Committee of Erzincan Binali Yıldırım University and institutional permission was obtained from the Provincial Directorate of National Education in 2023. Written informed consent was obtained from the children and their parents, and the children and their parents were assured that their personal information would not be disclosed to others, would not be used anywhere else, and that they had the right to leave the study at any time.

Statistical Analysis

SPSS 19.0 package program was used for statistical analysis of the data. Percentages, averages, t test, Anova, Bonferonni, Pearson Correlation analysis were used in the evaluation of the data. Statistical significance level was taken as 0.05 in all tests.

RESULTS

In the study, 57.3% of the students were 11 years old, 52% were female, 50% were in the fourth grade, 59.3% had a medium income, 82% of the students' mothers were housewives, 57.7% of the students' fathers were self-employed, 72.3% did not own a tablet/computer, 87.7% did not have a phone, 57.7% played with tablet/computer/phone for 0-1 hour per day, 61.3% preferred the phone as the most preferred tool for playing games, and 40% played puzzle brain teasers as the most preferred game type. The mean scores of CDGAS and SA were compared based on the descriptive characteristics of the participating students. Among the descriptive characteristics, it was found that the students whose gender was male, who perceived their income status as good, whose parents were civil servants, who had a tablet/computer/phone, who played games with tablet/computer/phone for 4 hours or more daily, and who preferred the computer the most for playing games had an effect on the mean score of the CDGAS. It was found that male gender, poorly perceived income status, having a civil servant mother and father, having a tablet/computer/telephone, playing games with tablet/computer/telephone for 4 hours or more daily, and preferring computer the most for playing games were effective variables on the mean score of SA ($p<0.05$) (Table 1).

Table 1. Distribution of students' descriptive characteristics according to CDGAS and SA (n=300)

Characteristics		n	%	CDGAS		SA	
				X±SD	Test/p	X±SD	Test/p
Age (Year)	10 years old	128	42.7	59.39±23.50	t: 1.262	5.12±0.45	t: -1.499
(10.57±0.49)	11 years old	172	57.3	56.00±22.56	p:0.208	5.52±0.42	p:0.135
Gender	Female	156	52	47.78±17.28	**t:-8.309**	18.85±5.23	**t:-2.672**
	Male	144	48	67.91±23.85	**p:0.000**	20.40±5.41	**p:0.008**
Clasroom	Grade 4	150	50	59.54±23.35	t:1.584	5.12±0.41	t:-1.835
	Grade 5	150	50	55.35±22.50	p:0.114	5.56±0.45	p:0.067
Income status	Good [a]	103	34.3	61.82±24.13	**F:6.454** **p:0.002** **Bonferroni**	19.87±5.15	**F:6.642** **p:0.002** **Bonferroni**
	Middle [b]	178	59.3	53.76±21.11		19.01±5.20	
	Bad [c]	19	6.3	68.21±27.01	**a>b, c>b**	23.57±6.42	**c>a, c>b**
Mother's profession	Housewife [a]	246	82.0	54.30±19.56	**F:35.646** **p:0.000** **Bonferroni**	19.09±5.13	**F:12.893** **p:0.000** **Bonferroni**
	Officer [b]	34	11.3	85.41±30.47		23.82±5.54	
	Self employment [c]	20	6.7	48.55±12.55	**a<b, c<b**	18.60±4.92	**b>a, b>c**
Father's profession	Unemployment [a]	34	11.3	51.73±15.01	**F:20.818** **p:0.000** **Bonferroni**	18.08±5.51	**F:5.033** **p:0.002** **Bonferroni**
	Officer [b]	71	23.7	74.52±29.22		21.61±5.44	
	Retired [c]	22	7.3	56.36±17.76		19.68±4.75	
	Self employment [d]	173	57.7	51.70±18.15	**b>a, b>c, b>d**	19.05±5.19	**b>a, b>d**
Ownership of tablet/computer	Yes	82	27.3	69.69±30.33	**t:4.742** **p:0.000**	6.08±0.67	**t:3.897** **p:0.000**
	No	217	72.3	52.84±17.51		4.85±0.32	
Ownership of telephone	Yes	36	12.0	77.25±31.50	**t:4.170** **p:0.000**	22.88±6.18	**t:4.016** **p:0.000**
	No	263	87.7	54.75±20.19		19.15±5.09	

		N	%				
Duration of daily play with tablet/computer /telephone (Hours) (1.82±1.59)	0-1 hour[a]	173	57.7	49.72±15.71	**F:39.368** **p:0.000** **Bonferroni** **c>b>a**	18.35±4.64	**F:17.838** **p:0.000** **Bonferroni** **c>b>a**
	1-3 hour[b]	92	30.7	62.84±25.04		20.36±5.28	
	4 Hour and over[c]	35	11.7	81.42±27.30		23.74±6.51	
Most preferred vehicle for playing games	Computer[a]	25	8.3	81.76±31.12	**F:13.254** **p:0.000** **Bonferroni** **a>b, a>c, a>d**	24.44±6.89	**F:10.614** **p:0.000** **Bonferroni** **a>c, a>d**
	Game console[b]	18	6.0	56.77±16.85		20.83±4.94	
	Telephone[c]	184	61.3	53.14±18.77		18.57±4.70	
	Tablet[d]	73	24.3	60.13±25.47		20.23±5.50	
The type of game you play the most	Adventure games	53	17.7	56.11±20.16	F:2.608 p:0.052	19.09±5.25	F:1.872 p:0.134
	War games	62	20.7	63.82±26.09		20.70±5.82	
	Sports games	65	21.7	58.67±23.82		20.15±4.83	
	Puzzle and brain games	120	40.0	54.08±21.48		18.95±5.39	
Evaluating Friend Relationships (0-10 points) (X±SD)						8.12±1.96	

SA:Aggression Scale, CDGAS:Digital Game Addiction Scale for Children

The mean scores obtained by students from CDGAS and SA are provided in Table 2.

Table 2. The mean scores obtained by students from CDGAS and SA (n=300)

Scale	Min-Max	X±SD
Total score of the CDGAS	24-120	57.45±22.99
Total score of the AS	13-39	19.60±5.36

SA:Aggression Scale, CDGAS:Digital Game Addiction Scale for Children

The groups in which the students' total scores on the CDGAS were graded are given in Table 3.

Table 3. The rating of total CDGAS score (n=300)

CDGAS	N	%
Normal group (1-24 points)	5	1.7
Low-risk group (25-48)	128	42.7
Risk group (49-72)	107	35.7
Dependent group (73-96))	29	9.7
Highly dependent group (97-120)	31	10.3

The results of the Pearson Correlation analysis for the relationship between the mean scores of the students on the CDGAS, the SA, the evaluation of their friendships, and the duration of the games played daily with the tablet/computer/phone are given in Table 4. A weak positive correlation (0.26≤r≤0.49) was found between CDGAS and SA (r=0.363; p<0.05). There was also a weak positive correlation (0.26≤r≤0.49) between CDGAS and the daily time spent playing games on tablet/computer/phone (r=0.418; p<0.05). Additionally, a very weak negative correlation (0.20<r) was observed between CDGAS and the evaluation of peer relationships (r=-0.149; p<0.05). It was determined that there is a weak positive correlation (0.26≤r≤0.49) between SA and the daily time spent playing games on tablet/computer/phone (r=0.344; p<0.05), and a very weak negative correlation (0.20<r) between SA and the evaluation of peer relationships (r=-0.144; p<0.05).

Table 4. Correlation evaluation of the correlation between students' CDGAS, SA, assessment of friend relationships and duration of daily play with tablet/computer/telephone (n=300)

Pearson Correlation		Duration of Daily Play with Tablet/Computer/ Telephone	Assessment of Friend Relationships	CDGAS	SA
Duration of Daily Play with Tablet/Computer/Telephone	r	1			
	p				
Assessment of Friend Relationships	r	-0.126[*]	1		
	p	0.030			
CDGAS	r	0.418[**]	-0.149[**]	1	
	p	0.000	0.010		
SA	r	0.344[**]	-0.174[**]	0.363[**]	1
	p	0.000	0.003	0.000	

According to the regression analysis results in Table 5, when the significance level corresponding to the F value is analyzed, it is seen that the model is statistically significant (F=22.832; p<0.05). When the beta coefficient value, t value and significance level of the independent variable were examined; it was determined that the duration of the games played with the tablet/computer/phone per day, the evaluation of friendship relationships and the total score of the SA of the CDGAS had a statistically significant effect (t=3.889, p<0.05; t=-2.031, p<0.05; t=4.362, p<0.05). The duration of daily play with tablet/computer/phone explains 18% of the variation on the assessment of peer relationships and the total score of the SA of the CDGAS (Adjusted R2=0.180). A one-unit increase in the variable of daily playing time with Tablet/Computer/Telephone causes a 0.225 increase (β=0.225) on the total score of SD, a one-unit increase in the variable of evaluating peer relationships causes a 0.108 decrease (β=-0.108), and a one-unit increase in the variable of ESOC causes a 0.253 increase (β=0.253). There is no autocorrelation problem in the model. Durbin Watson value is between 1.5 and 2.5 (DW=1.846).

DISCUSSION

In today's world, all technological tools have the task of educating, informing and entertaining people. Each individual is affected and exposed to these tools in different ways and at different rates. Undoubtedly, the role of these tools is very important for children to form a healthy personality and worldview [28]. Improper use of digital

games can lead to negative consequences, especially for children, families and the whole society [17]. One of these negative consequences is addiction and it is shown that playing digital games increases addiction and aggressive behavior [28]. In the light of this information, the study was conducted to determine the effect of digital game addiction on aggression in school-age children and discussed in line with the literature.

According to the descriptive characteristics of the students; it was found that the gender of male students was effective in the average digital game addiction. According to TUIK 2021 data, it was determined that the rate of boys playing digital games is higher than the rate of girls playing digital games [2]. In a study conducted by Küçük and Çakır (2020), it was determined that boys had higher digital game addiction than girls [1]. Likewise, this finding is compatible with the literature in other studies [3,27,29,30]. This result may be due to

the fact that boys are more interested in games, the internet, and visit game halls or cafes more. In the study, it was found that students whose parents were civil servants and who perceived their income status as good had a high level of digital game addiction. There are different results with this finding in the literature [1,30]. In a study conducted by Küçük and Çakır (2020), it was found that the average of digital game addiction of students whose mothers did not work was high, but this difference was not significant, and the working status of the fathers was found that the average of the group whose father was a tradesman was higher than the other groups (non-working, worker, civil servant), but this ifference was not significant [1]. The reason for the different findings with the literature may be that civil servant families spend more time outside the house and children spend more free time at home, and those with better income can access technological opportunities and tools more easily.

Table 5. Multiple regression results on the effect of students' CDGAS, SA, assessment of friend relationships and duration of daily play with tablet/computer/telephone on SA (n=300)

Analysis	Unstandardized Coefficients		Standardized Coefficients	t	P	Collinearity Statistics		95% Confidence Interval	
	B	Standard Error	Beta			Tolerance	VIF	Lower	Upper
Fixed	17.225	1.494	-	11.528	0.000	-	-	14.284	20.166
Duration of daily play with tablet/computer/telephone	0.756	0.195	0.225	3.889	0.000	0.821	1.218	0.374	1.139
Assessment of friend relationships	-0.295	0.145	-0.108	-2.031	0.043	0.973	1.028	-0.581	-0.009
CDGAS	0.059	0.014	0.253	4.362	0.000	0.816	1.226	0.032	0.086

*SA Aggression Scale, CDGAS: Digital Game Addiction Scale for Children, DW: 1.846, R2:0.188, Adjusted R2:0.180, F:22.832, *p:0.000*

In the study, digital game addiction was found to be higher in children who play games with tablet/computer/phone for 4 hours or more daily. According to TUİK 2021 data, boys who stated that they regularly play digital games played digital games for an average of 3 hours and 2 minutes and girls played digital games for 2 hours and 18 minutes on weekdays, while boys played digital games for 2 hours and 59 minutes and girls played digital games for 2 hours and 11 minutes on weekends [2]. Hasting et al. (2009) reported that children play video/computer games for an average of 3.4 hours a day [31], and Aydoğdu-Karaarslan (2015) reported that 88% of children spend 2-5 hours of their free time on the computer and internet every day [16]. In Güvendi, Demir, and Keskin's (2019) study, it was found that students with a game playing time of 120 minutes or more also had a high level of digital game addiction [27]. There are many studies in the literature that are compatible with this finding [22,30,32]. This result may be due to the fact that children who play games for a long time are left alone and have no other activities to do, and the level of addiction increases by directing the rest of their time to the game more.

In the study, it was found that children who had a tablet/computer/phone had a high level of digital game addiction. In the literature, no study was found to determine the addiction levels according to the status of having a technological device. This finding may be due to the fact that parents are civil servants, their income status is high and children have technological tools more easily compared to other years and can be considered as an important finding for the literature. In the study, it was found that the students who mostly preferred the computer to play games were effective in the average of digital game addiction. There are also studies in the literature containing similar findings [29]. In the literature, Güvendi, Demir, and Keskin (2019) reported that the digital game addiction of students who go to internet cafes to play digital games is higher than those who play on the phone [27]. Considering that they play computer games in internet cafes, it is seen that there are similar results. In addition, in Küçükali's (2015) study, which was conducted in different age ranges, it was stated that 97.7% of children in the 6-10 age group preferred computers for games and that this group also had high digital game addiction [32].

According to the descriptive characteristics of the students, it was found that male students had an effect on the mean level of aggression. In the literature, it is seen that there is a difference in studies looking at aggression levels according to gender. In the study of Küçük and Çakır (2020), it was concluded that the mean aggression scores of girls were higher, but this difference was not significant in the sub-dimensions of the aggression scale (physical aggression, verbal aggression, hostility, indirect aggression) [1]. In the studies conducted by Kongur (2015) [33] and Hazar et al. (2017) [3] on secondary school students, no differences were found according to gender. However, in the research conducted by Hazar and Ekici (2021) [29], Arslan et al. (2014) [15], Özgür, Yörükoğlu and Arabacı (2011) [34], Ustabaş (2011) [35] to examine aggression with various variables, it was concluded that the average aggression of males was higher. These differences in aggression rates according to gender in the literatüre may be due to the cultural differences in which students live and grow up, cognitive, affective and psychomotor differences due to the developmental period, the value given to gender in the place where they live, or the opportunities they have to play games. In the study, it was determined that students whose parents were civil servants and whose income status was perceived as poor had higher levels of aggression. In a study conducted by Küçük and Çakır (2020) [1], the aggression averages of students whose mothers worked were found to be high. Şahin and Owen (2009) argued that the relationship between family income level and aggression is significant and that the feeling of deprivation that increases with the inability to meet the needs brings aggression behavior [36]. In the study, it was found that children who played with tablet/computer/phone for 4 hours or more daily had a significant effect on aggression behavior. In Güvendi, Demir, and Keskin's (2019) study, it was observed that the mean aggression scores of students who played games for 120 minutes or more were significantly higher [27]. It may be due to the fact that children who play digital games for a long time exhibit aggressive and impatient behaviors due to decreased communication with the environment. In the study, it was found that the aggression scores of children who had a tablet/computer/phone were high. There is no study in the literature that determines the level of aggression according to the status of having a technological tool. Therefore, this finding can be considered as an

important finding for the literature. In the study, it was found that students who preferred computers had an effect on the mean aggression level. Again, in Güvendi, Demir, and Keskin's (2019) study, it was observed that the aggression scores of students who went to internet cafes to play digital games were significantly higher compared to their phones [27]. Considering the fact that they play with computers in internet cafes, it is a finding compatible with the literature.

According to the digital game addiction scores of the students; 1.7% were found to be in the normal group, 42.7% in the low-risk group, 35.7% in the risky group, 9.7% in the addicted group and 10.3% in the highly addicted group. In Demir's study conducted in 2024, it was concluded that children's digital game addiction is at a low level [30]. In the study conducted by Güvendi, Demir, and Keskin (2019) for secondary school students, it was concluded that students were in the risky group in digital game addiction and were inclined to exhibit aggressive behaviors [27].

In the study, a positive and weak relationship was found between digital game addiction and aggression. Violence and aggression are common in digital games. 89% of games played by children are designed to cause injury or death to another person. There is consistent evidence of a relationship between exposure to violent digital games and aggression [37,38]. Küçük and Çakır (2020) found a positive and weak correlation between digital gaming and aggression [1]. Güvendi, Demir, and Keskin (2019) also found a significant positive correlation between aggression and digital game addiction [27]. Studies in the literature also show that playing digital games increases addiction and aggressive behavior [28,39]. In the study, a positive and weak relationship was found between digital game addiction and daily playing time with tablet/computer/phone, and a positive and weak relationship was found between aggression and daily playing time with tablet/computer/phone. This finding obtained from the research is also consistent with the regression analysis. Güvendi, Demir, and Keskin (2019) found a positive relationship between playing time and digital addiction [27]. In the study, a negative and very weak relationship was found between digital game addiction and friend relationship evaluation, and a negative and very weak relationship was found between aggression and friend relationship evaluation. This finding is also consistent with the regression analysis. In the literature, it has been reported that violent digital games are associated with mental and psychosocial problems such as loneliness, depression and anxiety, aggression, tendency to violence, and distraction [40]. This situation may also be reflected in friendship relationships.

Limitations

The study has four limitations. The first one is that the study was conducted in a province in eastern Turkey and with students between the ages of 10 and 11. Considering the living conditions and sociocultural structure of the region and the age group in which the measurement tools were used, the results of the study cannot be generalized to all students. Secondly, the scales used to collect the study data are based on self-assessment. Therefore, it should be taken into consideration that students may have concealed their true feelings. Third, the results obtained from the analyses are based on cross-sectional data; longitudinal studies should be conducted to obtain stronger results.

Strengths of the Study

The strengths of this study are that it has findings that support the studies in the literature and there are very few studies in the literature that examine the effect of digital game addiction on aggression in school-age children.

CONCLUSION

In the study, it was determined that as students' digital game addiction levels increased, their aggression levels increased. At the same time, it was determined that as the daily playing time of the students increased,

their digital game addiction and aggressive levels increased. In line with these results; individual problem detection and solution can be made in children. Parents and teachers have a role to play in the formation of conscious internet and digital game use behaviors with both time and content control. In order to prevent digital game addiction, it can be suggested that children should use digital environments more instructively and be directed to sports and physical activity.

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