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Primary School Students' Digital Game Addiction and Happiness Levels at School

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Abstract

This study aims to investigate the relationship between 4th-graders' levels of digital game addiction and their happiness levels at school. The correlational research method is used to determine the relationships between different variables and to predict possible results. A total of 224 fourth-grade students, aged 9 and 10 years old, participated in the fall semester of 2021-2022 (the first year of the outbreak) and the spring semester of 2022-2023 (following the outbreak). Two scales were used to collect the data: "Happiness at School Scale for Primary School Students" and "Digital Game Addiction for Children." Descriptive statistics were used to determine the levels of digital game addiction among primary school students and their happiness levels at school. Correlational research statistics were used to investigate the relationship between the level of happiness at school and the level of digital game addiction. The results showed that a negative, moderately significant relationship was found between students' digital game addiction levels and their happiness levels at school. Distance education has decreased children's happiness at school and increased their addiction to games.

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Introduction

Games have an important role in children's development. They are fun activities that help children to socialize. Başal (2007) defines games as a free activity that lacks a specific purpose emerges spontaneously, and brings happiness. A child's cognitive, emotional, social, and physical skills are all developed through games, which are a valuable tool for integrating their inner and outer social worlds. With the increasing urbanization and inadequacy of playgrounds, as well as technological advancements, interest in traditional children's games has begun to decline, and digital games have taken center stage.

Technological advancements have led to changes in children's games, just as in many other areas. Games played on the streets, outdoors, with toys or various materials have evolved into digital forms with the advancement of technology. In light of this shift, Horzum (2011) characterizes games—which were previously played with friends in parks and on the streets—as virtual activities played at home or in front of computers in internet cafes. With the change, children who move away from the streets and other playgrounds are finding a place for themselves in digital playgrounds with the expansion of Internet content. This gaining a foothold brings with it the process of addiction. The extreme and addictive use of computers or video games that results in social and emotional issues is known as digital game addiction (Lemmens, Valkenburg, & Peter, 2009).

Nowadays, with the increasing use of digital games, studies on digital games and addiction also vary. According to these studies, a connection exists between digital game dependency and obesity (Koçakoğlu, 2019), aggressive behavior and digital game playing time (Güvendi, Demir, & Keskin, 2019), loneliness and digital game playing time (Öncel & Tekin, 2015), and digital game addiction. Studies have examined the relationship between school success and course success (Kestane, 2019) and the Use of digital games to teach mathematics in the classroom (Deng et al., 2020). Only a few studies have examined the relationship between happiness and digital game addiction. These studies examine the predictive effect of secondary school students' happiness levels on their playing of digital games (Cengiz, Peker & Demiralp, 2020) and the connection between the degree of game addiction and subjective happiness among college students (Odabaşı, 2016). Upon reviewing the literature, no research was found that looked at the connection between primary school pupils' levels of happiness at school and their addiction to digital games. It is believed that the research conducted in this aspect will contribute to future studies. This study is important in revealing children's level of commitment to play and its relationship with their level of happiness at school.

School Happiness and Digital Game Addiction

The COVID-19 pandemic has had a profound impact on the lives of people worldwide. It was determined that the pandemic had a significant impact on education (Junaidi et al., 2022) and student learning (Kalman et al., 2023). Schools in several nations have been forced to close due to the COVID-19 pandemic (Suyadi et al., 2023). Consequently, during this period, the increased amount of time spent at home has led to a rise in the use of technology. The physical distancing of students from schools has caused them to turn more to technology, which meets their most needed socialization and play needs. During this period, children's screen time increased to

approximately twice the normal time (Eng, 2020), resulting in a significant increase in students' technology use compared to before the pandemic.

During the pandemic, technology has brought some negatives to individuals, especially children. The inability to manage this process healthily has become a serious problem for students to face various problems, especially internet addiction. As a reflection of the pandemic, it has brought about changes in students' interests, motivation, success, and mental and psychological symptoms. Schools in several nations have been forced to close as a result of the COVID-19 pandemic (Lin, 2020). The adoption of unhealthy lifestyles during this period when the tendency towards online games increases makes it difficult to adapt to daily life (King et al., 2020), and fear and anxiety caused by COVID-19 are associated with internet addiction (Servidio et al., 2021). According to some research, children and teenagers used smartphones more frequently during the COVID-19 pandemic than they did before (Serra et al., 2021; Duan et al., 2021), and loneliness and smartphone addiction are two ways in which the fear of the virus affects mental health (Kayis et al., 2022). These studies show that the prevalence of smartphone use, compared to the previous era, indicates a greater need for technology.

Numerous studies are examining the impact of technology on students' motivation and academic performance during the pandemic. The overuse of short videos during this period negatively impacted students' academic performance (Nong et al., 2023), and school-age children's addiction to online gaming was strongly correlated with their motivation to learn (Rahayu et al., 2021). The overuse of short videos during this period negatively impacted students' academic performance (Nong et al., 2023), and school-age children's addiction to online gaming was strongly correlated with their motivation to learn (Rahayu et al., 2021). These studies demonstrate how students' motivation to learn is affected by digital game addiction following the COVID-19 pandemic.

According to document analysis, children's excessive use of technology in daily life can disrupt their relationships with friends, family, and schoolwork due to the amount of time they spend online. Additionally, the number of children who feel uncomfortable when they are not online has increased (Aslan, 2016). Similarly, with digital games taking a prominent place in daily life, children may disrupt their family, friends, and schoolwork due to the hours they spend playing digital games. In this context, children may not feel happy enough at school because they cannot access computers or technological devices or play digital games. For this reason, the study aims to investigate the relationship between the digital game addiction levels of 4th-grade students and their happiness levels at school.

Within the framework of this general purpose, answers to the following questions were sought:

- How are the digital game addiction levels of fourth-grade primary school students during and after the outbreak?
- What are the happiness levels of primary school fourth-grade students during and after the outbreak?
- Do the digital game addiction levels of primary school fourth-grade students show statistically significant differences during and after the outbreak according to gender variables?
- Do the happiness levels of fourth-grade primary school students differ statistically significantly during and after the outbreak according to gender variables?

- Do the digital game addiction levels of fourth-grade primary school students differ statistically significantly during and after the outbreak according to the variable of being a member of digital game sites?
- Do the happiness levels of fourth-grade primary school students differ statistically significantly during and after the outbreak according to the variable of being a member of digital game sites?
- Does the digital game addiction of fourth-grade primary school students predict their level of happiness at school?
 - Does digital game addiction predict fourth-grade students' digital game addiction and happiness levels at school during the outbreak?
 - Does it predict fourth-grade students' levels of digital game addiction and happiness at school after the outbreak?

Method

The correlational research method was applied in this study. To determine the relationships between various variables and predict potential outcomes, the correlational research method is employed. Determining the relationship between variables enables the forecasting of outcomes that the same variables will produce in various sample groups (Büyüköztürk et al., 2013). The study assessed the relationship between students' levels of school happiness and their dependency on digital games.

Participants

The study sample consists of primary school students in the 4th grade who attended classes in the fall semester of 2021-2022 (the first year of the outbreak) and the spring semester of 2022-2023 (following the outbreak). A total of 224 fourth-grade students aged 9 and 10 years old participated through convenience sampling. Table 1 shows the demographic information of the participants.

Table 1. Demographic information of the participants

Variable		N	%
Period	During Outbreak	85	37.9
	After Outbreak	139	62.1
Gender	Girl	106	47.3
	Boy	118	52.7
Membership to the Digital Game Site	Yes	32	14.3
	No	192	85.7

Data Collection Tools

Two scales were used in the research. Firstly, the "Happiness at School Scale for Primary School Students," which consists of 9 items with a triple Likert-type rating and two sub-dimensions, was developed by Gündoğan, Akar

(2019). The subscales of the scale are “happiness at school” and “unhappiness at school.” Analyses of Cronbach’s Alpha internal consistency coefficients for the happiness at school scale yielded a value of 0.79 for this research. The scale is rated as a three-point Likert type: (1) Never, (2) Sometimes, (3) Always. The lowest score that can be obtained from the scale is nine, and the highest score is 27.

The second scale is the “Digital Game Addiction for Children” scale developed by Hazar and Hazar (2017). The scale features a 5-point Likert-type rating, comprising 24 items and four sub-factors. These sub-factors are; “Excessive Focus and Conflict on Playing Digital Games,” “Tolerance Development During Game Time and the Value Attached to the Game,” “Postponement of Individual and Social Tasks/Homework,” “Psychological-Physiological Reflection of Deprivation and Immersion in the Game.” Cronbach Alpha internal consistency coefficient for the overall scale is 0.90.

Analyses of Cronbach’s Alpha internal consistency coefficients for the “Digital Game Addiction for Children” scale yielded a value of 0.93. The scale is rated as a five-point Likert type: (1) Strongly Disagree, (2) Disagree, (3) Undecided, (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 grading of the scale scoring, the following interpretations are provided: “1-24: Normal group, 25-48: Low-risk group, 49-72: Risky group, 73-96: Dependent group, 97-120: Highly addicted group.”

Data Analysis

Descriptive statistics were used to determine the levels of digital game addiction among 4th-grade primary school students and their happiness levels at school. In the study, Skewness-Kurtosis tests were performed to test the normality of the data. Table 2 gives kurtosis and skewness values for both scales.

Table 2. Kurtosis-Skewness Test Results

		<i>N</i>	Kurtosis		Skewness	
			Statistics	se	Statistics	se
Digital Game Addiction in Children		224	.723	.167	.564	.332
Time period	During Outbreak	85	.665	.261	.007	.517
	After Outbreak	139	.688	.206	.439	.408
Gender	Girl	106	.994	.235	1.266	.465
	Boy	118	.462	.223	-.104	.442
Happiness at School		224	-1.223	.167	1.484	.332
Time period	During Outbreak	85	-1.182	.261	.675	.517
	After Outbreak	139	-1,100	.206	1.045	.408
Gender	Girl	106	-1.151	.235	1.035	.465
	Boy	118	-1.069	.223	.837	.442

Table 2 shows that the scales are usually distributed, as the kurtosis and skewness values for both scales and their sub-dimensions are between -1.5 and +1.5 (Tabachnick & Fidell, 2013). An Independent sample t-test was applied

to determine the difference between the item total scores of *the Happiness at School and Digital Game Addiction for Children* scales, as well as the gender and membership status of digital game sites. Pearson Correlation (r) analysis was performed to determine the relationship between *Happiness at School* and *Digital Game Addiction for Children*. The SPSS package program was used to analyze the data, and a significance level of $p < .05$ was accepted.

Results

The descriptive statistics results of digital game addiction and happiness at school scales are given in Table 3.

Table 3. Descriptive Statistics Results of Digital Game Addiction for Children and Happiness at School Scale for Primary School Students

	N	\bar{X}	SS
Digital Game Addiction Scale	224	48.14	16.608
Happiness Scale at School	224	23.35	2.968

Table 3 indicated that the arithmetic mean of the digital game addiction scale was 48.14, while the mean score of the happiness at school scale was 23.35. The frequency and percentage distributions of participants' digital game addiction levels are given in Table 4.

Table 4. Frequency and Percentage Distributions of Participants' Digital Game Addiction Levels

		During Outbreak		After Outbreak		Total	
		N	%	N	%	N	%
Digital Game Addiction	Normal group	7	8	8	5.5	15	7
	Low-risk group	43	51	64	46	107	48
	Risk group	35	41	65	47	100	44
	Dependent group	0	0	2	1.5	2	1
Total		85	100	139	100	224	100

8% of the students participating in the research during the outbreak and 7% after the outbreak had a normal level of digital game addiction, while 41% during the outbreak and 47% after the outbreak were in the low-risk group. On the other hand, primary school students' digital game addiction has gradually increased after the outbreak. The results of the independent sample t -test comparing 4th-grade students' digital game addiction levels, happiness at school, and time variables are presented in Table 5.

Table 5 indicated that while the digital game addiction of the students increased after the outbreak compared to during the outbreak ($\bar{X}_{\text{during}} = 45.41$, $\bar{X}_{\text{after}} = 49.81$), there was a slight decrease in their happiness levels at school ($\bar{X}_{\text{during}} = 23.99$, $\bar{X}_{\text{after}} = 22.96$). In other words, while primary school students were a normal group in digital game addiction in the pre-pandemic period, they became a low-risk group after the pandemic.

Table 5. The Independent Sample *t*-Test Results

	Time period	<i>N</i>	\bar{X}	<i>SS</i>	<i>Sh_{\bar{X}}</i>	<i>t</i> test		
						<i>t</i>	<i>Sd</i>	<i>p</i>
Digital Game Addiction	During Outbreak	85	45.41	15.90	1.73	-1.93	222	.054
	After Outbreak	139	49.81	16.86	1.43			
Happiness at School	During Outbreak	85	23.99	2.83	.31	2.56	222	.011
	After Outbreak	139	22.96	2.98	.25			

The independent sample *t*-test results comparing 4th-grade students' digital game addiction levels and gender variables are presented in Table 6.

Table 6. Digital Game Addiction Levels of Students by Gender

Digital Game Addiction	Gender	<i>N</i>	\bar{X}	<i>SS</i>	<i>Sh_{\bar{X}}</i>	<i>t</i> test		
						<i>t</i>	<i>Sd</i>	<i>p</i>
During Outbreak	Girl	42	41.60	13.22	2.04	2.245	78.05	.028
	Boy	43	49.14	17.52	2.67			
After Outbreak	Girl	64	47.69	17.81	1.28	1.373	137	.17
	Boy	75	51.61	15.90	1.84			
Total	Girl	106	45.27	16.36	1.59	2.48	222	.014
	Boy	118	50.71	16.48	.52			

In general, the digital game addiction scores of boys ($\bar{X} = 50.71$) differ from those of girls ($\bar{X} = 45.27$), and this difference is statistically significant ($t_{(222)} = 2.48, p = .014$). Digital game addiction of boys and girls is significantly different from each other, and boys have higher levels of digital addiction than girls ($p < 0.05$).

The digital game addiction scores of boys ($\bar{X}_{\text{during}} = 49.14$) differ significantly from those of girls ($\bar{X}_{\text{during}} = 41.60$), and this difference is statistically significant ($t_{(78.05)} = 2.45, p = .028$) during an outbreak. Digital game addiction of boys and girls is significantly different from each other, and the digital addiction levels of boys were higher than girls during the outbreak ($p < 0.05$). Furthermore, the digital game addiction mean scores of boys ($\bar{X}_{\text{after}} = 51.51$) are different from those of girls ($\bar{X}_{\text{after}} = 47.69$), and this difference is not statistically significant ($t_{(137)} = 1.37, p = .17$) after the outbreak. The mean scores of digital game addiction of both boys and girls increased after the outbreak compared to during the outbreak.

Whether the participants' happiness levels at school differed by gender during and after the outbreak was compared using an independent samples *t*-test, and the results are presented in Table 7. The mean happiness at school level of girls ($\bar{X} = 23.51$) is slightly different from that of boys ($\bar{X} = 23.51$), and this difference is not statistically significant ($t_{(222)} = -.77, p = .44$). When the process during outbreak is examined, the mean scores of boys ($\bar{X} = 23.67$) is different from that of girls ($\bar{X} = 24.31$) and this difference is not statistically significant ($t_{(83)} = -1.305, p = .30$). When the after outbreak is examined, the mean scores of boys ($\bar{X} = 22.98$) is very close to that

of girls ($\bar{x} = 22.93$) ($t_{(137)} = -.100, p = .92$). The happiness at school levels of both girls and boys decreased after outbreak compared to before outbreak. In other words, students' happiness levels at school decreased after the pandemic.

Table 7. Happiness at School Levels of Students by Gender

Happiness at School	Gender	<i>N</i>	\bar{x}	<i>SS</i>	<i>Sh_x</i>	<i>t</i> test		
						<i>t</i>	<i>Sd</i>	<i>p</i>
During Outbreak	Girl	42	24.31	2.64	.41	-1.305	83	.30
	Boy	43	23.67	3.01	.46			
After Outbreak	Girl	64	22.93	3.05	.38	-.100	137	.92
	Boy	75	22.98	2.94	.34			
Total	Girl	106	23.51	2.95	.287	-.77	222	.44
	Boy	118	23.20	2.98	.27			

The results of the independent sample *t*-test, used to determine the digital game addiction levels and membership status of digital game sites among fourth-grade students, are presented in Table 8.

Table 8. The Independent Sample t-Test Results of the Digital Game Addiction Levels and Membership Status of Digital Game Sites

Digital Game Addiction	Membership Status on Digital Platforms	<i>N</i>	\bar{x}	<i>SS</i>	<i>Sh_x</i>	<i>t</i> test		
						<i>t</i>	<i>Sd</i>	<i>p</i>
During Outbreak	Yes	17	49.06	15.10	3.64	1.057	83	.293
	No	68	44.50	16.20	1.96			
After Outbreak	Yes	15	56.73	18.15	.4.67	1.696	137	.092
	No	124	48.98	16.58	1.49			
Total	Yes	32	52.66	16.74	2.96	1.65	222	.098
	No	192	47.39	16.51	1.19			

The digital game addiction scores of members of digital game sites ($\bar{x} = 52.66$) were higher than the average of non-members ($\bar{x} = 47.39$); however, there was no statistically significant difference ($t_{(222)} = 1.65, p = .098$). When the outbreak is examined, the mean scores for digital game addiction among members of digital platforms ($\bar{x}_{\text{during}} = 49.06$) are higher than those for non-members ($\bar{x}_{\text{during}} = 44.50$). However, this difference is not statistically significant ($t_{(83)} = 1.06, p = .293$). After examining the outbreak, the mean scores of digital game addiction for those who are members of digital platforms ($\bar{x}_{\text{after}} = 56.73$) are higher than those for those who are not ($\bar{x}_{\text{after}} = 48.98$). This difference is not statistically significant ($t_{(137)} = 1.70, p = .092$).

The results of the independent sample *t*-test, used to determine the happiness levels of 4th-grade students at school and their membership status on digital game sites, are presented in Table 9.

Table 9. The Independent Sample t-Test Results of the Happiness Levels at School and Membership Status of Digital Game Sites

Happiness Level at School	Membership Status	<i>N</i>	\bar{X}	<i>SS</i>	<i>Sh_x</i>	<i>t</i> test		
						<i>t</i>	<i>Sd</i>	<i>p</i>
During Outbreak	Yes	17	22.60	15.10	3.41	-2.340	83	.022
	No	68	24.34	16.20	2.58			
After Outbreak	Yes	15	21.40	3.78	.98	-2.170	137	.032
	No	124	23.15	2.83	.25			
	Yes	32	22.03	3.58	.63	-2.314	37.58	.026
Total	No	192	23.57	2.80	.20			

When the happiness levels of 4th-grade students and their membership status on digital game sites are examined, the mean scores of students who are members of digital game sites ($\bar{X} = 22.03$) differ from the mean scores of students who are not members of digital game sites ($\bar{X} = 23.57$). There is a statistically significant difference between the mean scores of students who are members of digital game sites and the mean scores of students who are not members of digital game sites, and this difference is in favor of students who are not members of digital game sites ($t_{(222)} = -2.31, p = .026$). In other words, the happiness levels of students who are not members of digital game sites at school are higher than those of students who are members of digital game sites.

When the outbreak is examined, the average happiness level at school of those who are members of digital platforms ($\bar{X}_{\text{during}} = 22.60$) is lower than that of those who are not ($\bar{X}_{\text{during}} = 24.34$). This difference is statistically significant ($t_{(83)} = -2.34, p = .022$). After examining the outbreak, the mean happiness level scores at school for those who are members of digital platforms ($\bar{X}_{\text{after}} = 21.40$) are lower than those for those who are not ($\bar{X}_{\text{after}} = 23.15$), and this difference is statistically significant ($t_{(137)} = -2.17, p = .032$). In other words, primary school students who are members of digital platforms tend to have lower levels of happiness at school than those who are not, and this situation has worsened even further after the pandemic.

Regression and simple linear regression analysis were calculated to determine the effect of digital game addiction on the happiness levels of primary school students participating in the research. Data for this analysis are reported in Table 10.

Table 10. Analysis Results on the Correlation between Happiness at School and Digital Game Addiction

	<i>N</i>	<i>r</i>	<i>p</i>
Happiness Level at School	224	-.538	0.00*
Digital Game Addiction			

Note. * $p < .05$.

Table 10 shows that a statistically significant relationship was found between happiness level at school and digital game addiction ($p < .05$). The significant relationship detected is negative and moderate ($r = -.538$). After a

significant relationship was detected between the variables, regression analysis was started. The statistics for the regression analysis are presented in Table 11.

Table 11. Digital Game Addiction Regression Analysis Results for Predicting Happiness at School

	B.	se	β	R^2	t	p
Intercept	27.97	.514			54.45	0.00*
Happiness at School	-.096	0.01	-.538	.290	-9.52	0.00*

Note. * $p < .05$.

Table 11 showed that digital game addiction in primary school fourth-grade students negatively and significantly predicts their happiness levels at school ($\beta = -.096$, $p < .05$). However, it was determined that digital game addiction explained 29% of the variance in students' happiness levels at school ($R^2 = .29$).

Simple linear regression analyses were calculated to determine the effect of digital game addiction during the outbreak on the happiness levels of primary school students. Data for this analysis are reported in Table 12.

Table 12. Analysis Results on the Correlation between Happiness at School and Digital Game Addiction during Outbreak

	N	r	p
During Outbreak			
Happiness at School	85	-.603	0.00*
Digital Game Addiction			

Note. * $p < .05$.

Table 12 highlighted that a statistically significant relationship was found between happiness level at school and digital game addiction ($p < .05$). The significant relationship detected is negative and moderate ($r = -.603$). After a significant relationship was detected between the variables, regression analysis was started. The statistics for the regression analysis are presented in Table 13. Table 13 shows that digital game addiction in primary school fourth-grade students negatively and significantly predicts their happiness levels at school ($\beta = -.096$, $p < .05$). However, it was determined that digital game addiction explained approximately 36.3% of the variance in students' happiness levels at school ($R^2 = 0.363$).

Table 13. Digital Game Addiction during Outbreak Regression Analysis Results for Predicting Happiness Level at School

	B.	se	β	R^2	t	p
Intercept	28.86	.749			36.51	0.00*
Happiness at School	-.107	0.016	-.603	.363	-6.89	0.00*

Note. * $p < .05$.

Simple linear regression analyses were calculated to determine the effect of digital game addiction on the happiness levels of primary school students after the outbreak. Data for this analysis are reported in Table 14.

Table 14. Analysis Results on the Correlation between Happiness at School and Digital Game Addiction after Outbreak

After Outbreak	<i>N</i>	<i>r</i>	<i>p</i>
Happiness at School	139	-.488	0.00*
Digital Game addiction			

Note. * $p < .05$.

A statistically significant relationship was found between happiness at school and digital game addiction ($p < .05$). The significant relationship detected is negative and moderate ($r = -0.488$). After a significant relationship was detected between the variables, regression analysis was started. The statistics for the regression analysis are presented in Table 15.

Table 15. Digital Game Addiction after Outbreak Regression Analysis Results for Predicting Happiness at School

Variable	B.	se	β	R^2	<i>t</i>	<i>p</i>
Intercept	27.26	.693			39.30	0.00*
Happiness at School	-.086	0.013	-.488	.238	-6.54	0.00*

Note. * $p < .05$.

Digital game addiction in fourth-grade primary school students negatively and significantly predicts their happiness levels at school ($\beta = -.488$, $p < .05$). However, it was determined that digital game addiction explained approximately 23.8% of the variance in students' happiness levels at school ($R^2 = .238$).

Conclusion

While individuals may react to the pandemic in different ways, and individual experiences during these unusual times have a substantial effect on life satisfaction (Hendekci & Kadiroglu, 2024). Especially the closure of schools and the transition to distance education, leading students to be physically away from their schools and peers and start spending time in virtual environments. In this study, the relationship between the digital game addiction levels of fourth-grade primary school students and their happiness levels at school was examined. Students' levels of happiness at school and their addiction to digital games were found to be negatively and moderately significantly correlated. Researchers found a negative correlation between secondary school students' addiction to digital games and their level of happiness (Cengiz et al., 2020; Odabaş, 2016). Children's increased addiction to digital games has a detrimental effect on personal and mental problems as well as their school satisfaction (Şenol et al., 2023).

The research study's conclusions differ based on when and how the outbreak occurred. The degree of digital game addiction among students varied significantly by gender. Boys have higher digital game addiction levels during the outbreak compared to girls. Studies also support this finding (Erboy & Vural, 2010; Gentile, 2009; Şahin & Tuğrul, 2012). After the outbreak, the digital game addiction mean scores of both boy and girl students increased.

Research indicates that children's addiction to online games rose during the pandemic (Han et al., 2022; Li et al., 2021; Vuorre et al., 2021; King et al., 2020). These studies show that there is an increase in students' internet gaming addiction habits during the pandemic period.

Addiction to digital games during and after the outbreak was found to have a negative and significant relationship with school satisfaction. There was a decrease in the happiness levels of girls and boys after the outbreak compared to during the outbreak. The studies showed that school children's problematic internet use during the pandemic period affects their psychological well-being (Chen et al., 2021; Wang et al., 2022). This circumstance may also impact children's school satisfaction.

Students' happiness levels at school varied depending on whether they were members of digital game sites or not. Students who are not members of digital game sites have higher happiness levels at school than students who are members of digital game sites. During the pandemic, gaming rates rose by 75%, particularly in the U.S.A. (Clifford, 2020). In this regard, it has been observed that an increasing number of students are joining online gaming communities due to the rise in digital game addiction during the pandemic.

Study Implications

This research has significant implications for policymakers. In primary school, which is an important period of a child's cognitive, emotional, and behavioral development, students spending too much time in the digital environment will negatively affect their development. Consequently, students' habits have changed as a result of the pandemic. Distance education has decreased children's happiness at school and increased their addiction to games. In this process, several factors contribute to digital game addiction. Families and teachers have significant responsibilities in reducing this dependency. It would be beneficial for families to spend more time communicating with their children and for teachers to organize activities that raise awareness about the harms of game addiction in classes. Discovering the activities, hobbies, and different interests that students can enjoy in real life and providing guidance in that direction will help students be happier in school by reducing their interest in digital media. In future research, studies examining the relationship between digital game addiction and happiness at different grade levels can be included, and more detailed research can be conducted on the subject. Additionally, the findings obtained from this study can be applied to other research by comparing them with studies in the literature.

Statements and Declarations

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References

- Aslan, A. (2016). *Changes in children's safe internet use in Turkey between 2010 and 2015 and reflections of practices* (Unpublished Doctoral thesis). Ataturk University, Erzurum.
- Başal, H. (2007). Children's games played by children in Turkey in the past years. *Uludağ University Faculty of Education Journal*, 20(2), 243–266.
- Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2008). *Scientific research methods*. Pegem Akademi.
- Cengiz, S., Peker, A., & Demiralp, C. (2020). Happiness as a predictor of digital game addiction. *Online Journal of Technology Addiction & Cyberbullying*, 7(1), 21- 34.
- Chen, I. H., Chen, C. Y., Liu, C. H., Ahorsu, D. K., Griffiths, M. D., Chen, Y. P., ... & Wang, S. M. (2021). Internet addiction and psychological distress among Chinese schoolchildren before and during the COVID-19 outbreak: A latent class analysis. *Journal of Behavioral Addiction*, 10(3), 731–746.
- Clifford, T. (2020). Web traffic spiked 20% in one week amid coronavirus shutdown, Verizon CEO says. *CNBC newsletters*. <https://www.cnn.com/2020/03/19/verizon-ceo-web-traffic-up-20percent-in-one-week-amid-coronavirus-shutdown.html> .
- Deng, L., Wu, S., Chen, Y., & Peng, Z. (2020). Digital game-based learning in a Shanghai primary school mathematics class: A case study, *Institute of International and Comparative Education*, 36(5),709-717.
- Duan, L., He, J., Li, M., Dai, J., Zhou, Y., Lai, F. & Zhu, G. (2021). Based on a decision tree model for exploring the risk factors of smartphone addiction among children and adolescents in China during the COVID-19 pandemic. *Front. Psychiatry*, 12, 897.
- Eng, J. (2020). Parents are alarmed as kids' screen time skyrockets during the Covid-19 crisis. Here's what you can do. <https://parents-together.org/parents-alarmed-as-kids-screen-time-skyrockets-during-covid-19-crisis-heres-what-you-can-do/>
- Erboy, E., & Vural, RA (2010). Factors affecting computer game addiction of 4th and 5th grade primary school students. *Aegean Education Journal*, 11(1), 39-58.
- Gentile, D. (2009). Pathological video-game use among youth ages 8 to 18: A national study. *Psychological Science: a journal of the American Psychological Society / APS*, 20(5), 594–602. <https://doi.org/doi:10.1111/j.1467-9280.2009.02340.x>
- Gündüz, M. (2014). Primary school students' thoughts about effective teachers, *YYÜ Faculty of Education Journal*, 11(1), 114–128.
- Güvendi, B., Tekkurşun Demir, G. & Keskin, B. (2019). Digital game addiction and aggression in secondary school students. *OPUS International Journal of Social Research*, 11(18), 1194-1217.
- Han, T. S., Cho, H., Sung, D., & Park, M. H. (2022). A systematic review of the impact of COVID-19 on the game addiction of children and adolescents. *Frontiers in Psychiatry*, 13, 976601.
- Hendekci, A. & Kadiroglu, T. (2024). The Relationship between Coronavirus Phobia and Life Satisfaction among Adolescents in the Post-Pandemic Period *Child Indicators Research*. <https://doi.org/10.1007/s12187-024-10167-w>
- Horzum, M., B. (2011). Examining the computer game addiction levels of primary school students according to various variables. *Education and Science*, 36(159), 56–68.

- Junaidi, F., Suwandi, S., Saddhono, K., & Wardani, N. (2022). Improving Students' Social Intelligence Using Folktales During the COVID-19 Pandemic. *International Journal of Instruction*, 15(3), 209–228. <https://doi.org/10.29333/iji.2022.15312a>
- Kalman, M., Akdas, M. S., Sansur, Z., & Can, F. E. (2023). A qualitative study of home learning during the Covid-19 pandemic in Turkey: A focus on home environments. *Issues in Educational Research*, 33(2), 631-652.
- Kayis, A. R., Satıcı, B., Deniz, M. E., Satıcı, S. A., & Griffiths, M. D. (2022). Fear of COVID-19, loneliness, smartphone addiction, and mental well-being among the Turkish general population: A serial mediation model. *Behav. Inf. Technol.*, 41, 2484–2496.
- Kestane, M. (2019). *The relationship between digital game addiction and the academic success of secondary school students*. (Unpublished master's thesis), Biruni University, Institute of Educational Sciences, Istanbul.
- King, D. L., Delfabbro, P. H., Billieux, J., & Potenza, M. N. (2020). Problematic online gaming and the COVID-19 pandemic. *J. Behav. Addict* 9, 184–186.
- Koçakoğlu, U. (2019). *The relationship between computer game addiction and obesity among 3rd and 4th grade primary school students: Konya example* (Unpublished medical specialty thesis). Necmettin Erbakan University.
- Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, 12(1), 77-95.
- Li, X., Vanderloo, L M., Keown-Stoneman, C. D. G., Cost, K. T., Charach, A., Maguire, J. L. et al. (2021). Screen use and mental health symptoms in canadian children and youth during the COVID-19 pandemic. *JAMA Netw Open*. 4. doi: 10.1001/jamanetworkopen.2021.40875
- Lin, M. P. (2020). Prevalence of internet addiction during the COVID-19 outbreak and its risk factors among junior high school students in Taiwan. *International Journal of Environmental Research And Public Health*, 17(22), 8547.
- Nong, W., He, Z., Ye, J. H., Wu, Y.F., Wu, Y. T., Ye, J. N., & Sun, Y. (2023). The relationship between short video flow, addiction, serendipity, and achievement motivation among Chinese vocational school students: The post-epidemic era context. *Healthcare*, 11, 462.
- Odabaş, Ş. (2016). *Üniversite Öğrencilerinin Online Oyun Bağımlılığı Düzeylerinin Öznel Mutluluk Düzeyleriyle İlişkisi (The Relationship Between Online Gaming Addiction Level And Subjective Happiness Level Among University Students)*, (Unpublished master Thesis), Sakarya University, Sakarya, Türkiye.
- Öncel, M., & Tekin, A. (2015). Examination of secondary school students' computer game addiction and loneliness. *İnönü University Institute of Educational Sciences Journal*, 2(4), 7-17.
- ParentsTogether.(2020). *Survey shows parents alarmed as kids' screen time skyrockets during COVID-19 crisis*. https://parents-together.org/survey-shows-parents-alarmed-as-kidsscreen-time-skyrockets-during-covid-19-crisis/?mod=article_inline
- Rahayu, I. S., Karana, I., Hardiansyah, M. A. , Dewi, D. H., & Elihami, E. (2021). The relationship of online game addiction with learning motivation -in school age children on COVID19 pandemic. *Linguist. Cult. Rev.*, 5, 384–396.
- Serra, G., Scalzo, L.L., Giuffrè, M., Ferrara, P. & Corsello, G. (2021). Smartphone use and addiction during the

- coronavirus disease 2019 (COVID-19) pandemic: Cohort study on 184 Italian children and adolescents. *Ital. J. Pediatr.*, 47, 1–10.
- Servidio, R., Bartolo, M.G., Palermi, A.L., & Costabile, A. (2021). Fear of COVID-19, depression, anxiety, and their association with Internet addiction disorder in a sample of Italian students. *J. Affect. External. Rep.*, 4, 100097.
- Suyadi., Selvi, I. D., Sibiwaihi., Zahroh, U., & Muassomah. (2023). Children's future adversity: Learning loss risk during online learning in Covid-19 pandemic. *International Journal of Instruction*, 16(2), 457–478. <https://doi.org/10.29333/iji.2023.16225a>
- Şahin, C., & Tuğrul, V. M. (2012). Examining the computer game addiction levels of primary school students. *Zeitschrift für die Welt der Türken Journal of World of Turks*, 4(3), 115-130.
- Şenol, Y., Şenol, F.B. & Can Yaşar, M. Digital game addiction of preschool children in the Covid-19 pandemic: social, emotional development and parental guidance. *Curr Psychol* (2023). <https://doi.org/10.1007/s12144-023-04323-8>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (sixth ed.). Pearson.
- Vuorre, M., Zendle, D., Petrovskaya, E., Ballou, N., & Przybylski, A. (2021). *A Large-Scale Study of Changes to the Quantity, Quality, and Distribution of Video Game Play During a Global Health Pandemic*. American Psychological Association.
- Wang, Y., Liu, B., Zhang, L., & Zhang, P. (2022). Anxiety, depression, and stress are associated with internet gaming disorder during COVID-19: Fear of missing out as a mediator—*Frontiers in Psychiatry*, 13, 827519.