ORIGINAL ARTICLE

Investigation of the Effect of Secondary School Students' Digital Game Playing Levels on Loneliness

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ABSTRACT

Background: It is thought that one of the factors affecting the loneliness of the students is the level of digital game playing.

Aim: This study aimed to examine the effect of the digital game playing level of secondary school students on loneliness.

Methods: The universe of the research consisted of 753 secondary school students. The sample consisted of high school students studying in the state schools of Aydın province. Digital Game Addiction (DGA-7) Scale developed by Lemmens et al. (2009) adapted to Turkish by Irmak et al was used. In the third part, The Ucla Loneliness Scale developed by Russel, Peplau and Ferguson (1978) and adapted into Turkish by Demir (1989) was used as data collection tools. In terms of statistics, frequency, percentage and reliability coefficient calculations were performed. Moreover, Pearson Correlation analysis was used to determine the relationship between digital game addiction and loneliness of the participants, and Manova analysis was used to examine the digital game addiction and loneliness levels of the participants in terms of variables.

Results: While the digital game playing level of secondary school students was low, their level of loneliness was found to be moderate, and it was determined that there was a significant and negative difference between digital game addiction and loneliness. A statistically significant difference was found between the levels of Digital Game Addiction (DGA7) and the variable of gender, presence of digital devices, and daily digital game playing status. However, it was concluded that there was a statistically significant difference between the perceived loneliness levels of the participants and their gender, age, income status, and availability of digital devices.

Conclusion: Since students who own digital devices and spend a lot of time with them had high levels of game addiction and perceived loneliness, it was recommended to minimize the contact of students with digital platforms and create environments where they can socialize more.

Keywords: Digital Game, Loneliness, Secondary Education Students.

INTRODUCTION

Although information technologies are an important part of our daily lives, they become indispensable in our lives by increasing their impact day by day[1, 2]; While computers and the internet make life easier in many areas, it is becoming an increasingly popular area of interest as a game and entertainment tool. Digital games have taken the place of traditional game activities due to technological developments that go one step further with each passing day, urbanization, and the insufficiency of playgrounds. These games, which have users of almost all ages, are especially interested in young people and the time they spend playing games is increasing day by day[3, 4]. Nowadays, it is seen that sports, as educational tool, is used by all segments of society[5]. One of these segments can be considered as digital games.

Digital games are games that are programmed with various technologies and provide users with a visual environment and user input[6]. These games, which are programmed with various software and use various technologies, are classified as digital console games, computer games, and online games according to the technology used[7]. The player can play alone (single-player) against artificial intelligence or in multi-player mode against other players[8]. There are many scientific studies on the contribution of these games to child development, especially mental development. An important tool for gaining skills such as strategic thinking, fast and correct decision making, and problem-solving is digital games. However, the nature of these games sitting at a desk for hours has effect children in the developmental period negatively, especially the skeletal, muscular, circulatory, and respiratory systems, and prevent interpersonal communication by disconnecting people from social life. Studies show that especially violent games turn players into individuals prone to violence in the long term. Also, games are causing an important problem like "digital game addiction" which is a type of behavioral addiction[9,10,11,12,13,14,15].

In today's world, where especially the young population using information technologies very actively, the side effects of digital games are frequently mentioned. It is stated digital games cause young people to be negatively affected physically and socially. One of the most important criticisms for the digital games is that it causes addiction and negatively affects children mentally, physically, socially and morally[16]. When similar studies in the literature are examined[17,18,19], it is emphasized that the first come to the mind negativities of digital games are violence and addiction. It is observing that violent digital games increase the sense and behavior of violence in real life[18,20,21,22]. Another important problem that young people are facing by the impact of digital games is loneliness.

In our daily life, we often hear terms such as loneliness and feeling lonely from our surroundings. Especially in recent years, it is thought that factors such as changing and developing living conditions, developments in technology, and changes in social structure are effective in

feeling lonely[23].

On the other hand, when considered as a concept, loneliness means being alone as an individual, and it is a fact that today technology drags people into loneliness. While the concept of loneliness meaning that had no friends 10-15 years ago, today this concept can expressing as playing with technological devices in one's world[24,25]. Nowadays, the proliferation of digital game usage areas, especially the fact that digital games are an indispensable part of young people's daily lives, and the increasingly limited outdoor playgrounds are thought to have not only positive effects but also negative effects on young people[26]. According to this information, this study aimed to examine the effect of secondary school students' level of digital game playing on loneliness.

MATERIAL & METHODS

This study conducted to examine the effect of secondary school students' level of digital game playing on their level of loneliness. In the method part of the study, information about the research model, universe and sample, data collection process and data analysis were included

Research Model: In this research, the relational screening model was used within the scope of the screening model. This model aims to determine the existence and/or degree of co-change between two or more variables[27].

Sample group: The universe of the research consisted of secondary school students. The sample consisted of high school students studying in the state schools of Aydın province. The data were delivered to the participants via Google forms and their voluntary participation in the research was based on. A total of 755 participants were reached and 2 forms that were found to be incomplete or inaccurate were not found suitable for analysis. In the study, 753 forms belonging to the participants were analyzed.

Data Collection Tools: The "Digital Game Addiction (DGA-7)" scale was used to determine the digital game addiction levels, and the "Ucla Loneliness" scale was used to determine the perceived loneliness levels with the personal information form prepared to determine the demographic characteristics of the students.

Digital Game Addiction (DGA-7) Scale: The scale was developed by Lemmens et al.[28] and adapted into Turkish by Irmak and Erdoğan[19]. The scale was a 7-item short form of the DGA-21 scale consisting of 21 items and 7 sub-dimensions. The scale was a 5-point Likert type, with a single factor structure, and the scale was a 5-point scale as 1 = never 5 = always. The minimum score to be obtained from the scale was 7 and the maximum score was 35. There were no reverse scored items in the scale.

Ucla Loneliness Scale: UCLA (University of California Los Angeles Loneliness Scale) Loneliness Scale, developed by Russell, Peplau and Ferguson[29] and adapted to Turkish by Demir[30]. The scale consisted of 20 items, 10 of which were coded straight and 10 were reverse coded. The scale was a 4-point Likert type scale consisting of "I never live", "I rarely live", "sometimes I live", and "I live often". The highest score that can be obtained from the scale was 80 and the lowest score was 20. The higher the score obtained from the scale showed the higher the level of loneliness.

Data analysis: The obtained data were statistically analyzed by using the SPSS 25.0 package program. The extreme values in the data set and the assumption of multivariate normality was examined with the help of Mahalanobis distance values and the data showing extreme values were removed from the analysis. In terms of statistics, frequency, percentage and reliability coefficient calculations were performed. In addition, Pearson correlation analysis was used to determine the relationship between digital game addiction and loneliness of the participants, and MANOVA analysis was used to examine the digital game addiction and loneliness levels of the participants in terms of some variables. Analysis was performed according to 95% confidence interval.

RESULTS

In this part of the study, statistical data regarding the digital game playing and loneliness levels of the students were included.

Table 1. Demographic Information of Participants

Variables		f	%
Age	14 aged and below	123	16,3
	15 aged	218	29,0
	16 aged	190	25,2
	17 aged and above	222	29,5
	Total	753	100,0
Gender	Female	495	65,7
	Male	258	34,3
	Total	753	100,0
Grade	9th grade	304	40,4
	10th grade	221	29,3
	11th grade	121	16,1
	12th grade	107	14,2
	Toplam	753	100,0
Monthly İncome	Bad	51	6,8
	Moderate	448	59,5
	Good	254	33,7
	Total	753	100,0
Having a computer-tablet at home	Yes	304	40,4
	No	221	29,3
	Total	753	100,0
Digital game playing	Yes	422	56,0
	No	331	44,0
	Total	753	100,0
Daily playing time	I do not ever play	227	30,1
	1 hour	234	31,1
	2 hours	97	12,9
	3 hours	75	10,0
	4 hours	37	4,9
	5 hours and above	83	11,0
	Total	753	100,0

According to the results of the examination in Table 1, the majority of the participants were 17 years and older (29.5%). When we look at the highest variables in their category, female participants (65.7%) were in the gender variable; 9th grade students (40.4%) were in the grade variable; those with middle income (59.5%) were in monthly income variable; Participants with a computer-laptop at home (40.4%) in the Having a computer-tablet at home variable. Moreover, the participants who said I play digital games (56%) and participants who play digital games for 1 hour a day (31.1%) were the highest in their category.

Table 2. Reliability Analysis Results

Scales	Cronbach Alpha Coefficient
Digital Game Addiction	,839
Loneliness	,881

Table 3. Descriptive Values for the Scales

Variables	Minimum	Maximum	x̄	SD
Digital Game Addiction	1,00	4,71	1,86	,78
Loneliness	1,16	4,00	2,98	,59

* Very Low (1.00-1.80), Low (1.81-2.60), Medium (2.61-3.40), High (3.41-4.20), Very High (4.21-5.00).

Table 4. Pearson Correlation Analysis Results

	Digital Game	Loneliness
Digital Game Addiction	1	
	-	
Loneliness	-,155**	1
	,000	-

In the reliability analysis conducted to determine the internal consistency of the Digital Game Addiction (DGA-7) Scale, it was seen that the Cronbach's Alpha value was 0.83 and the Cronbach's Alpha value of the Ucla Loneliness Scale was 0.88. According to this result, it was concluded that the scales were "highly reliable" (Table 2).

While the digital game playing level of secondary school students was low, it was seen that their level of loneliness was moderate (Table 3).

According to Table 4, it was seen that there was a significant and negative difference between digital game addiction and loneliness (p<, 05).

When Table 5 was examined, it was seen that the established model was significant (F = 41,963; p = ,00). A statistically significant difference was observed as a result of the Manova analysis performed between the variables of Digital Game Addiction and Loneliness and the gender variable (p< ,05). According to this result, it was determined that the scores of male participants in both scales were higher than female participants.

According to the results of the Table 6 examination, it was seen that the model established was significant (F = 2.214; p =. 039). While there was no statistically significant difference as a result of the Manova analysis performed between Digital Game Addiction and the age variable (p> ,05), there was a statistically significant difference as a result of the Manova analysis performed between Loneliness and the age variable (p< ,05). According to the Bonferonni test conducted to determine which groups had the difference, it was concluded that the loneliness levels of students aged 14 and under were higher than those of 15 years old students.

Table 5. Comparison of Digital Game Addiction and Loneliness Variables by Gender

Scales	Gender	N	$\bar{X}$	SD	F (group)	p	F (model)	p
Digital Game Addiction	Female	495	11,97	4,98	60,202	,000**	41,963	,000
	Male	258	15,09	5,69				
Loneliness	Female	495	55,72	11,39	10,673	,001**		
	Male	258	58,50	10,41				

Table 6. Comparison of Digital Game Addiction and Loneliness Variables by Age Variable

Scales	Age	N	$\bar{X}$	SD	F (group)	p	Bonferonni	F (model)	p
Digital Game Addiction	(1)14 aged and below	123	13,52	5,56	,602	,614	-	2,214	,039
	(2)15 aged	218	12,75	5,45					
	(3)16 aged	190	12,92	5,48					
	(4)17 aged and above	222	13,16	5,34					
Loneliness	(1)14 aged and below	123	58,53	10,69	3,413	,017	1>2		
	(2)15 aged	218	55,03	11,32					
	(3)16 aged	190	57,75	11,50					
	(4)17 aged and above	222	56,32	10,69					

Table 7. Comparison of Digital Game Addiction and Loneliness Variable by Class Level

Scales	Grade	N	$\bar{X}$	Sd	F (group)	p	Bonferonni	F (model)	p
Digital Game Addiction	(1) 9th grade	304	13,18	5,54	,894	,444	-	,929	,473
	(2)10th grade	221	12,60	5,23					
	(3)11th grade	121	13,54	6,12					
	(4)12 th grade	107	13,00	4,71					
Loneliness	(1) 9th grade	304	56,63	11,14	1,078	,357	-		
	(2)10th grade	221	56,75	11,35					
	(3)11th grade	121	55,41	11,86					
	(4)12 th grade	107	58,06	9,73					

When Table 7 was examined, it was seen that the established model was not significant (F = ,929; p = ,473). There was no statistically significant difference as a result of the Manova analysis performed between the variables of Digital Game Addiction and Loneliness and the grade level (p> ,05).

Table 8. Comparison of Digital Game Addiction and Loneliness Variables by Monthly Income Variable

Scales	**Income**	**N**	$\overline{X}$	**SD**	**F (grOup)**	**p**	**Bonferonni**	**F (model)**	**p**
Digital Game Addiction	(1) Bad	51	13,05	5,58	1,334	,264	-	6,826	,000
	(2) Moderate	448	12,79	5,26					
	(3) Good	254	13,48	5,71					
Loneliness	(1) Bad	51	50,43	11,59	11,470	**,000**	3>1 3>2		
	(2) Moderate	448	56,41	10,96					
	(3) Good	254	58,39	10,90					

Table 9. Comparison of Digital Game Addiction and Loneliness Variables According to having a computer-tablet at home

Scales	Computer-Tablet	N	$\overline{X}$	SD	F (group)	p	F (model)	p
Digital Game Addiction	Yes	518	13,66	5,67	22,290	,000	22,728	,000
	No	235	11,67	4,62				
Loneliness	Yes	518	57,72	11,53	15,000	,000		
	No	235	54,36	9,85				

Table 10. Comparison of Digital Game Addiction and Loneliness Variables by Daily Digital Game Play Time

Scales	Duration	N	$\overline{X}$	SD	F (group)	p	Bonferonni	F (model)	p
Digital Game Addiction	(1) Do not ever play	227	9,18	2,89	126,024	,000	2,3,4,5,6>1 3,4,5,6>2 4,5,6>3 5,6>4	46,898	,000
	(2) 1 hour	234	11,97	3,63					
	(3) 2 hours	97	14,14	3,83					
	(4) 3 hours	75	15,46	4,76					
	(5) 4 hours	37	18,40	5,04					
	(6) 5 hours and above	83	20,74	6,16					
Lonelines	(1) Do not ever play	227	55,88	10,69	,692	,630	-		
	(2) 1 hour	234	57,11	10,62					
	(3) 2 hours	97	57,77	10,69					
	(4) 3 hours	75	56,68	11,37					
	(5) 4 hours	37	54,94	14,14					
	(6) 5 hours and above	83	57,07	12,56					

According to the results of the Table 8 examination, it was seen that the model established was significant (F = 6,826; p = ,000). While there was no statistically significant difference as a result of the Manova analysis performed between Digital Game Addiction and income status (p> ,05), a statistically significant difference was observed in the Manova analysis performed between Loneliness and income level (p< ,05). According to the Bonferonni test conducted to determine in which groups the difference was, it was concluded that the level of loneliness of the students with medium and good income was higher than the students with bad income.

When Table 9 was examined, it was seen that the established model was significant (F = 22,728; p = ,00). A statistically significant difference was observed as a result of the Manova analysis performed between the variables of Digital Game Addiction and Loneliness and the variable of having a computer-tablet (p< ,05). According to this result, it was seen that the scores of students who had a computer-tablet at home were higher in both scales.

When Table 10 was examined, it was seen that the model established was significant (F46,898; p = ,000). There was a statistically significant difference as a result of the Manova analysis performed between digital game addiction and daily digital game play variable (p< ,05). According to the Bonferonni test conducted to determine the difference, the addiction levels of those who play daily games were higher than those who did not play digital games; the addiction levels of those who play games for 2 hours or more were higher than those who play digital games for 1 hour a day. Moreover, it was observed that the addiction levels of those who play games for 3 hours or more per day were higher than those who play digital games for 2 hours a day, and those who play games for 4 hours or more per day were higher than those who play digital games for 3 hours a day.

DISCUSSION

With the rapidly increasing technology, the purpose of using technology and the tools used by today's people were changing. While the use of this changing technology responded to our needs, it also brought other problems to the agenda. In this study, the effect of secondary school students' level of digital game playing on loneliness was examined.

According to the results of the examination in Table 1, the majority of the participants were 17 years and older (29.5%). When we look at the highest variables in their category, female participants (65.7%) were in the gender variable; 9th grade students (40.4%) were in the grade

variable; those with middle income (59.5%) were in monthly income variable; Participants with a computer-laptop at home (40.4%) in the Having a computer-tablet at home variable. Moreover, the participants who said I play digital games (56%) and participants who play digital games for 1 hour a day (31.1%) were the highest in their category (Table 1). According to Table 3, while the digital game playing level of secondary education students was low, it was seen that their level of loneliness was moderate. When Table 4 was examined, it was determined that there was a significant and negative difference between digital game addiction and loneliness (p< ,05).

No statistically significant difference was found in gender between the variables of Digital Game Addiction and Loneliness (p< ,05) (Table 5). According to this result, it was seen that the scores of male participants in both scales were higher than female participants. This result was similar to the results of the research conducted by Akbaş, Usta & Çakır[31] on secondary school students in the literature. Also, similar results were obtained in studies conducted on secondary school students[32,33,34,35]. This situation revealed that gender difference affects even digital game addiction.

When Table 6 was examined, there was no statistically significant difference between the digital game addiction and the age variable as a result of the Manova analysis (p> ,05), it was concluded that there was no statistically significant difference between loneliness and the age variable (p> ,05). According to the Bonferonni test conducted to determine in which groups the difference was, it was concluded that the loneliness levels of students aged 14 and under were higher than those of 15 years old students. According to the results of the study conducted by Soyöz-Semerci and Balcı[36], it was concluded that children between the ages of 14-15 were more prone to digital game addiction.

According to Table 7, no statistically significant difference was found as a result of the Manova analysis performed between the Digital Game Addiction and Loneliness variables and the class variable (p> ,05).

While there was no statistically significant difference between Digital Game Addiction and the income variable (p> ,05), a statistically significant difference was found between Loneliness and the income variable (p> ,05). According to the Bonferonni test conducted to determine which groups the difference was, it was concluded that the level of loneliness of the students with poor income was higher than the students with medium and good income. Students with medium and high income can use mobile phones, computers, tablets, etc. Since the probability of having technological devices may be higher than students with a poor income level. Students with medium and good incomes were more likely to spend more time with technological devices, so it can be thought that the level of loneliness perceived by students with low income was higher.

When Table 9 was examined, it was concluded that there was a statistically significant difference between the variables of Digital Game Addiction and Loneliness and the variable of having a computer tablet at home (p< ,05). According to this result, it was seen that the scores of the students who have a computer, tablet at home on both scales were higher than the students who do not have a computer, tablet at home. As a result of the research in the literature, it was seen that students spend time with their mobile phones[36]. In comparing the level of digital game addiction according to the device used while playing games was in favor of students using consoles between students who use smartphones while playing games and students who use consoles. It was determined that the difference in digital game addiction was in favor of students who used computers while playing games and students who used smartphones and those who use computers.

It was seen that there was a statistically significant difference between Digital Game Addiction and the variable of daily digital game playing status (p< ,05). According to the Bonferonni test conducted to determine the difference, the addiction levels of those who play daily games were higher than those who did not play digital games (Table 10). The addiction levels of those who play games for 2 hours or more were higher than those who play digital games for 1 hour a day, it was observed that the addiction levels of those who play games for 3 hours or more daily were higher than those who play digital games for 2 hours a day, and those who play games for 4 hours or more daily had higher addiction levels than those who play digital games for 3 hours a day. According to the data obtained as a result of the research conducted by Mustafaoğlu and Yasacı[37]; Soyöz-Semerci and Balcı[36], which supports this research, it was seen that the time for children to play digital games during the day is 179.9 minutes (3 hours). Also, it was determined that the duration of playing digital games during the day was longer for boys than for girls. However, it was observed that children play digital games on many platforms (tablet, computer, smartphone, etc.). As a result, while it was seen that the effects of digital games on students and as a result, the level of loneliness of individuals was increased psychosocially, efforts can be made to direct young people to stay away from technology and direct these times to leisure time activities. Especially, sports and arts events held at these times can increase the quality of the time, contribute to their social environment, and allow them to reduce their level of loneliness. Since students who own digital devices and spend a lot of time with them have high levels of game addiction and perceived loneliness, it was recommended to minimize the contact of students with digital platforms and create environments where they can socialize more.

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