The Relationship Between Digital Game Addiction, Communication Skills and Loneliness Perception Levels of University Students

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Abstract

Today, with the developing technology, the use of computers, mobile phones and the internet has become indispensable tools of people's lives. Technology has created new risks while facilitating the living conditions. Especially, there are various addiction concepts that negatively affect human life. Digital game addiction has been added to the concepts of addiction. Game addiction negatively affects the cognitive, psychological and social life of the individual. It is seen that such addiction rapidly spreading around the world are also widespread among children and young people in Turkey. The young population in Turkey is quite intense; it is necessary to investigate the problems related to digital games and find the optimal solution. In this research, it is aimed to investigate the digital game addiction, communication and loneliness perception levels of university students in terms of demographic variables. The sample of the study included 646 students studying at İnönü University in the 2018-2019 academic year. A survey that consists of personal information form, Digital Game Addiction Scale, Communication Skills Scale and UCLA Loneliness scale were used to collect data. The data obtained from the study were analyzed using independent t-test, one-way analysis of variance test (ANOVA) and Pearson's Product-Moment Correlation Analysis. According to the results; digital game addictions of the participants vary according to gender, grade, parental educational degree, daily playing time and number of siblings. However, income level has no effect on digital gaming addiction. While gender, grade level, mother's educational degree, duration of play and number of siblings have effects on communication skills; father's education level and income level have no effect on it. There are significant relationships between students' perception of loneliness and gender, mother and father educational degree and duration of playing time. One of the main finding obtained in the study; is a significant relationship between digital game addiction and communication skills while there is no statistically significant correlation between digital game addiction and loneliness.

Keywords: digital game addiction, communication skills, UCLA loneliness scale, socio-demographic variables

1. Introduction

The developing information and communication technology has changed the daily lives and habits. The importance of internet and virtual environment in the lives has increased. Children who previously played traditional games with their friends in street and parks prefer to play on computer in electronic virtual environments (Horzum, Ayas, & Balta, 2008; Gentile, 2009; Yiğit, 2017; Bülbül, Tunç, & Aydil, 2018; Göldağ, 2018). As a result of these preferences, the number of individuals who are addicted to digital games increases day by day in the world. Among the most important problems, digital gaming addiction is seen as a danger for children and young people and now it is a danger for individuals of middle age and older as well. The studies reveal that people feel anxious when they spend time without using phone, browsing daily emails and sharing via social media (Eryılmaz & Çukurluöz 2018, p. 890). Griffiths stated that playing excessive and continuous digital games may lead to addiction and defined as the unconscious use of computer and video games that cause social or emotional problems in the individual (Griffths, 1995)

Although there is no criterion for definitive diagnosis, there are nine-item criteria that determine the digital game addiction published by the American Psychiatric Association (2013). These are engagement of the mind with the game, tolerance (the need to play more and more on the internet), withdrawal symptoms (nervousness, anxiety and sadness), persistence/continuity (failure of attempts to stop or reduce play), displacement (preferring online games to hobby and entertainment activities), continuing to overuse despite the damages known, lying (giving

deceptive information to others about playing time on the internet), escape (using online games as an escape route from negative affect) and conflict/loss (losing opportunities related to work, education or career).

According to the World Health Organization (2018), a period of at least 12 months is sufficient to diagnose addiction, but the duration may be shortened if the severity of symptoms and requirements of diagnostic are met. In some of the studies on game addiction, digital games will contribute positively to the mental development of children and young people (Çavuş, Ayhan, & Tuncer, 2016). Especially, children who have hyperactivity and attention deficit could improve the concentrating on o duty, being careful, adapting to the commands given, and coordinating hand skills (Çavuş, Ayhan, & Tuncer, 2016; Yalçın & Bertiz, 2019). It has been seen that digital games contribute to the development of the child's memory, ranking, classification and problem solving skills. In addition, it has been seen that it provides positive contributions to calm down of stressed adults (Tarhan & Nurmedov, 2011; Mustafaoğlu & Yasacı, 2018). However, the uncontrolled use of these digital games has made "digital game addiction" at the same level as drug addiction. Game addiction negatively affects the cognitive, psychological and social domains of the individual. Regarding the cognitive concept; not thinking in practically, difficulty in responding (Zhou, Yuan, & Yao, 2012), attention deficit (Gentile, 2009), repetition of the same answers, hyperactivity and irritability problem may appear in individuals.

In studies conducted on the psychological effects of game addiction, it was concluded that individuals prefer to stay alone by avoiding face to face communication because they spend more time in virtual platform. As a result of this, it is seen that individuals have loneliness, low life satisfaction, high social anxiety, low self-confidence, high anxiety and depression risk, and exhibit aggressive behaviors. The academic success of individuals who are addicted to digital games also decreases. The spending time increases, the individual may experience psychological difficulties and negligence on their tasks and duties. In many studies, in this topic, it is observed that individuals with digital game addiction have problems in their social behaviors. These individuals have feelings of hostility and tendency to violence (Fischer, Kastenmüller, & Greitemeyer, 2010; Aksel, 2018; Dursun & Eraslan-Çapan, 2018). Overplaying digital games adversely affects the socialization process of an individual and pushes him to loneliness. It causes the individual to move away from society. Personality traits such as ability to communicate, entrepreneurship and courage are negatively affected by decreasing communication skills with increasing digital playing time. Instead of making real friends, one can choose to play games and be alone (Yücel & Gürsoy, 2013, p. 212).

Loneliness, which can be seen in every period of an individual's life, is defined as an increase in the level of anxiety, anger towards his/her environment, sadness and feeling of being different from other people, and not being able to meet the need for intimacy in the community or in private relationships (Esen, 2010, p. 6). Researches have been shown that loneliness that people can experience in every period of the lives, especially in adolescence, is related to individual or social problems, alcoholism, suicide, psychological problems, low self-esteem, obesity, depression. Individuals who cannot establish healthy relationships with their environment are dragged into loneliness and the time spent in virtual environment increases.

The aim of this study is to determine whether there is a relationship between digital game addiction and communication skills and between digital game addiction and loneliness perception levels of university students.

Within the scope of the research, answers to the following research questions were sought:

- What are the levels of digital game addiction among university students?
- What are the loneliness levels of university students?
- What are the perception levels of the communication skills of university students?
- Do the digital game addiction levels of university students differ according to gender, education level of parents, monthly income level and duration of time spent playing digital game?
- Do university students' perceptions of loneliness and communication skills differ according to gender, education level of parents, monthly income level and duration of time spent playing digital game?
- Is there a meaningful relationship between digital game addiction and loneliness levels of university students?
- Is there a meaningful relationship between digital game addiction and perception levels of communication skills of university students?

2. Methodology

2.1 Data

The study was conducted with relational screening model. Screening model is approach that aim to describe a situation as it exists in the past or still present. The subject, individual or object that is the subject of the research is tried to be defined in its own conditions and as it is (Karasar, 2005).

The population of the study consists of students studying at İnönü University in the fall semester of 2018-2019 academic year. Simple random sampling method was used for sample selection.

Table 1. Descriptive statistics of students

	Frequency	Percentage		Frequency	Percentage
Gender			Educational degree of father		
Female	356	55.1	Illiterate	18	2.8
Male	290	44.9	Primary school	190	29.4
Grades			Middle School	113	17.5
First	170	26.3	High school	176	27.2
Second	135	20.9	University	149	23.1
Third	219	33.9	Educational degree of Mother		
Fourth	122	18.9	Illiterate	97	15
Number of siblings			Primary school	270	41.8
Zero	32	5	Middle School	108	16.7
One	82	12.7	High school	103	15.9
Two	137	21.2	University	68	10.5
Three	148	22.9	Income Level (Monthly)		
More than 4	247	38.2	Less than $100	36	5.6
Spent time for online games (hour per day)			$ 100-150	21	3.3
1-3 Hours	411	63.6	$ 151-200	48	7.4
4-6 Hours	166	25.7	$ 201-250	131	20.3
7-10 Hours	69	10.7	More than $250	410	63.5
Total	646	100	Total	646	100

Basic information about the students is given in Table 1. A total of 646 students participated in this study which examined the relationship between digital game addiction, communication and loneliness perception levels of university students. The gender distribution is as follows: 356 females (55.1%) and 290 males (44.9%). 170 of these students are in the first year (26.3%), 135 are in the second year (20.9%), 219 are in the third year (33.9%) and 122 are in the fourth year (18.9%). Number of sibling might be a significant factor for the level of addiction, communication and loneliness. 32 of the students (5.0%) does not have siblings. 82 students (12.7%) has one sibling, 137 students (21.2%) has two siblings, 148 students (22.9%) has three siblings and 247 students (38.2%) has four or more siblings. Parents' educational degree may be another indicator of these levels. Based on the mother's educational degree, 270 (41.8%) mothers of students were primary school graduates, 108 (16.7%) secondary school graduates, 103 (15.9%) high school graduates, 68 (10.5%) university graduates and 97 (15%) mothers are illiterate. When look at the educational degree of fathers, 190 fathers of students (29.4%) were primary school graduates, 113 (17.5%) secondary school graduates, 176 (27.2%) high school graduates, 149 students (23.1%) university graduates, 18 (2.8%) fathers of students are illiterate. One of the important element of the digital game addiction is time spent playing games. 411 (63.6%) of the students who participated in the research played digital games for 1-3 hours a day. 166 students (25.7%) play 4-6 hours and 69 students (10.7%) play digital games 7-10 hours a day. According to the monthly income level of students; 36 students (5.6%) have income less than $100, 21 students (3.3%) have income between $100 and $150, 48 students (7.4%) have income between $151 and $200, 131 students (20.3%) have income between $201 and $250 and 410 students (63.5%) have income more than $250.

2.2 Scales

Three different scales below were used to answer the research questions. In the survey form, first part consists of personal information; second part consists of Digital Game Addiction Scale, Communication Skills Scale and

UCLA Loneliness Scale.

Personal Information Form: This form used to obtain personal information about the participants. There are seven questions to get information about gender, grades, number of siblings, level of income, educational degree of parents and duration of time spent playing digital game.

Digital Game Addiction Scale (GAS): The scale created by Lemmens, Valkenburg, and Peter (2009) was developed to determine the problematic digital game behaviors of adolescents between the ages of 12-18. The reliability and validity of this scale was conducted by Irmak and Erdoğan (2015). Turkish version of the scale's reliability coefficient was 0.72 according to the Cronbach's alpha score. In this study, Cronbach's alpha coefficient of the GAS is 0.82. While the original scale consisted of 21 items, a short form consisting of seven sub-dimensions was used in this study. The scale has a five-point Likert type factor structure and scores are from 1 to 5 (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often). A maximum of 35 and a minimum of 7 points are taken from the survey. According to the GAS-7 scale, monothetic and polythetic diagnoses were used to determine whether an individual is game addicted or not. According to the monothetic diagnosis, if a person scores 3 or more for all seven items, one is defined as game addicted. On the other hand, in a sense of the polythetic diagnosis, if one scores 3 or more for at least four of seven items, one is defined as game addicted. The total scores obtained by the students' survey give the Game Addiction Score. The higher the score, the higher the level of addiction.

Communication Skills Scale (CSS): A scale developed by Korkut in 1996. It was developed to understand how individuals evaluate their communication skills. Firstly, the scale was prepared for high school students and then adapted to university students. The scale, which is a 5-point Likert-type scale, consists of 25 items. Answers are ordered from never (1) to very often (5) as in previous scale. The high of the score obtained from the scale means that individuals evaluate their communication skills positively (Korkut, 1996). Internal consistency coefficient of the scale for high school students was 0.80; reliability coefficient was 0.76 according to the test-retest method (Korkut, 1996).

UCLA (University of California, Los Angeles) Loneliness Scale: The scale was developed by Russell, Peplau and Ferguson (1978) to measure the loneliness levels of individuals and then converted into a new form containing half positive and half negative expressions by Russell, Peplau and Cutrona (1980). UCLA Loneliness Scale was adapted to Turkish by Demir (1989). 10 of the 20 items were coded in one direction and the other 10 were coded in the opposite direction. Items 1, 4, 5, 6, 9, 10, 15, 16, 19 and 20 included in the scale contain positive expressions and positive expressions are scored as Never (4), Rarely (3), Sometimes (2), Often (1). Items 2, 3, 7, 8, 11, 12, 13, 14, 17 and 18 contain negative expressions and scored vice versa, Never (1), Rarely (2), Sometimes (3), Often (4). The total scores obtained by the students' survey give the Loneliness Score. The highest score is 80 and the lowest score is 20. If the score is between 20 and 35, the level of loneliness is low, so these students do not experience the feeling of loneliness. A score of 35 to 60 points is considered as moderate level and a score of 60 and above are considered to be high. The higher the score, the higher the level of loneliness. The validity of the original scale was found to be 0.67 by Russell, Peplau and Ferguson (1978). In Turkey, the validity and reliability of this scale was performed by Demir (1989). In this study, the internal consistency coefficient of the scale (Cronbach Alfa's) was calculated as 0.96. The test-retest reliability coefficient of the scale was found to be 0.94 (Demir, 1989).

3. Results

Statistical analysis of the data was performed using SPSS 24.0 statistical package program. Firstly, the data is examined based on the Kolmogorov-Smirnov and Shapiro-Wilk normality tests. Because the data is obtained from Likert type scale, the tests results show that the data is not normally distributed as generally. However, according to the Kim (2013), if the size of sample is greater than 300, in the case of an absolute skew value less than 2 or an absolute kurtosis value less than 7, the data can be determined as normally distributed. Therefore, the data were tested by descriptive analyzes (mean and standard deviation) and parametric analyzes such as independent t-test, one-way analysis of variance (ANOVA) and Pearson's Product-Moment Correlation Analysis. Confidence level is 95% for all cases.

In this part of the research, findings obtained from the data collected are given. Based on the research questions, the required analysis results are as follows.

Table 2. Digital game addiction status of students

	Monothetic		Polythetic	
	Frequency	Percentage	Frequency	Percentage
Digital Game Addict	28	4.3	143	22.1
Not a Digital Game Addict	618	95.7	503	77.9
Total	646	100.0	646	100.0

The digital game addiction status of the students participating in the research is given in Table 2. According to the monothetic format, 4.3% of the students are digital game addicts and 95.7% are not dependent. According to the polythetic format, 22.1% is addicted to digital games and 77.9% is not addicted.

The relations between the scales (Digital Game Addiction, Communication Skills and Loneliness) and factors (gender, education level of parents, monthly income level and duration of time spent playing digital game) are determined by using statistical methods below.

Table 3. Independent t-test results of digital game addiction, communication skills and loneliness levels based on gender

	Gender	n	$\bar{x}$	S	df	t	p
Digital Game Addiction	Female	356	11.7275	5.24138	644	-7.806	0.000
	Male	290	15.4345	6.82385			
Communication Skills	Female	356	101.1994	16.04016	644	6.061	0.000
	Male	290	92.6690	19.73214			
Loneliness	Female	356	47.3427	6.29961	644	-2.909	0.004
	Male	290	48.9000	7.30315			

All three results are presented based on the Levene's test and tests suggest that there is homogeneity of variances. According to the independent t-test result, there is a statistically significant difference between females and males participating in the study on digital game addiction level (t_{644} = -7.806, p <0.05). When the mean of digital game addiction of female ($\bar{x}_{Female}$=11.7175) and male ($\bar{x}_{Male}$= 15.4345) students are examined, it is seen that the game addiction scores of male students are higher than female students. In the case of communication, there is a statistically significant difference between females and males as shown in Table 3 (t_{644} = 6.061, p <0.05). When the mean of females ($\bar{x}_{Female}$=101.1994) and males ($\bar{x}_{Male}$=92.6690) regarding communication skill levels are examined, it is seen that the average communication skill score of female students are much higher than male students. On the other hand, there is a statistically significant difference between males and females (t_{644} = -2.909, p <0.05) with respect to loneliness score. When the mean of loneliness score of female ($\bar{x}_{Female}$= 47. 3427) and male (($\bar{x}_{Male}$= 48.90) are considered, it is seen that the loneliness score of females are close to males but lower than them.

Table 4. One-way ANOVA test results of digital game addiction, communication skills and loneliness levels based on grades

		Sum of Squares	df	Mean Square	F	Sig (p)	Difference
Digital Game Addiction	Between Groups	548.382	3	182.794	4.721	0.003	1-3
	Within Group	24857.533	642	38.719			
	Total	25405.915	645				
Communication Levels	Between Groups	4179.224	3	1393.075	4.232	0.006	1-2,3
	Within Group	211311.353	642	329.145			
	Total	2 15490.577	645				
Loneliness Score	Between Groups	92.297	3	30.766	0.663	0.575	Not
	Within Group	29797.575	642	46.414			
	Total	29889.872	645				

Student's grade is one of the factors of these three scales. Based on the ANOVA test results, the means of grades are different for digital game addiction and communication skill. After controlling the test of homogeneity of

variances (Levene Statistics), Games-Howell test used to evaluate the differences. On the other hand, there is no statistically significant difference in grade for loneliness. According to Table 4, there is a statistically significant difference between the levels of digital game addiction of the students with respect to the grades they enrolled (F $_{(3;642)}$ = 4.721, p< 0.05). A significant difference was found between the students in first grade ($\bar{x}_{1st\ Grade}$= 14.80) and the students in third grade ($\bar{x}_{3rd\ Grade}$= 12.49). Based on this finding, it can be said that the level of digital game addiction of first year students is higher than that of third year students. This difference could be a cause of being novice in university life and not having social life with classmates. There is a statistically significant difference between the communication skill levels of the students based on grades (F $_{(3;642)}$ = 4.232, p< 0.05). A significant difference was found between the students in first year ($\bar{x}_{1st\ Grade}$= 93.33) and second and third year students ($\bar{x}_{2nd\ Grade}$= 99.40, $\bar{x}_{3rd\ Grade}$= 99.33). It can be said that the communication skills levels of the first year students were lower than the second and third year students. Again, this might be a cause of being beginner in university life. There is no statistically significant difference between the loneliness levels of the students who participated in this research according to the grades (F $_{(3;642)}$ = 0.663, p > 0.05).

Table 5. ANOVA test results of digital game addiction, communication skills and loneliness levels based on mother's education

		Sum of Squares	df	Mean Square	F	Sig (p)	Difference
Digital Game Addiction	Between Groups	1784.383	4	446.096	12.105	0.000	E-A,B,C,D
	Within Group	23621.532	641	36.851			
	Total	25405.915	645				
Communication Levels	Between Groups	5173.264	4	1293.316	3.942	0.004	B-E
	Within Group	210317.313	641	328.108			
	Total	215490.577	645				
Loneliness Score	Between Groups	597.337	4	149.334	3.268	0.011	A-E
	Within Group	29292.534	641	45.698			
	Total	29889.872	645				

A: Illiterate; B: Primary; C: Secondary; D: High School; E: University.

Parents' educational degree is another important element for answer the research questions. ANOVA test results suggest that the means of degrees are different for digital game addiction, communication skill and loneliness. After controlling the test of homogeneity of variances (Levene Statistics), Games-Howell test used to evaluate the differences. According to Table 5, there is a statistically significant difference between the levels of digital game addiction of the students with respect to their mother's educational degree (F $_{(4;641)}$ = 12.105, p < 0.05). A significant difference was found between the students whose mother educational degree was university ($\bar{x}_{University}$ = 17.67) and those whose mother educational degree were primary school ($\bar{x}_{Primary}$ = 12.48), secondary school ($\bar{x}_{Secondary}$ = 13.00), high school ($\bar{x}_{High\ School}$ = 14.55) and illiterate ($\bar{x}_{Illiterate}$ = 12.11). From this result, it can be said that the level of digital game addiction of the students whose mother education level is university is significantly higher than others. It could be the consequence of having a job of educated mothers. There is a statistically significant difference between the communication skill levels of the students according to their mother's educational background (F $_{(4;641)}$ = 3.942, p< 0.05). A significant difference was found between students with maternal education level of university ($\bar{x}_{University}$= 90.86) and students with maternal education level of primary school ($\bar{x}_{Primary}$ = 99.87). Based on this finding, it is seen that the communication skills of the students whose mother educational degree is primary school is higher than the students whose mother educational degree is university. There is a statistically significant difference between the loneliness scores of the students according to their mother's educational background (F $_{(4;641)}$ = 3.268, p < 0.05). A significant difference was found between the students whose mother education level is university ($\bar{x}_{University}$= 46.48) and those whose mother is illiterate ($\bar{x}_{Illiterate}$ = 49.74). Based on this finding, the loneliness level of the students whose mother is illiterate is higher than the students whose mother education level is university.

Table 6. ANOVA test results of digital game addiction, communication skills and loneliness levels based on father's education

		Sum of Squares	df	Mean Square	F	Sig (p)	Difference
Digital Game Addiction	Between Groups	868.657	4	217.164	5.673	0.000	E-B,C
	Within Group	24537.258	641	38.280			
	Total	25405.915	645				
Communication Levels	Between Groups	1893.671	4	473.418	1.421	0.225	Not
	Within Group	213596.907	641	333.225			
	Total	215490.577	645				
Loneliness Score	Between Groups	447.466	4	111.867	2.435	0.046	A-E
	Within Group	29442.405	641	45.932			
	Total	29889.872	645				

A: Illiterate; B: Primary; C: Secondary; D: High School; E: University.

When look at the fathers' educational degree, ANOVA test results suggest that the mean score of degrees are different for digital game addiction and loneliness. As seen in Table 6, there is a statistically significant difference between the levels of digital game addiction of the students based on their father's educational degree ($F_{(4;641)} = 5.673$, $p < 0.05$). A significant difference was found between the students whose father educational degree is university ($\bar{x}_{University} = 15,11$) and the students whose father educational degree is primary school ($\bar{x}_{Primary} = 12.42$) and secondary school ($\bar{x}_{Secondary} = 12.09$). It can be said that digital game addiction levels of the students whose father graduated from university are higher than those who have father graduated from primary school and secondary school. There is no statistically significant difference between the communication skill levels of the students according to the educational level of the father ($F_{(4;641)} = 1.421$, $p > 0.05$). There is a slightly significant difference between the levels of loneliness of the students based on their father's educational degree ($F_{(4;641)} = 2.435$, $p < 0.05$). The students whose father is illiterate ($\bar{x}_{Illiterate} = 50.22$) feel more lonely than the students whose father educational degree is university ($\bar{x}_{University} = 46.89$). All differences are evaluated by the Games-Howell test.

Table 7. ANOVA test results of digital game addiction, communication skills evaluation perceptions and loneliness levels based on spending time for playing digital games

		Sum of Squares	df	Mean Square	F	Sig (p)	Difference
Digital Game Addiction	Between Groups	1321.622	2	660.811	17.642	0.000	C-A,B
	Within Group	24084.293	643	37.456			
	Total	25405.915	645				
Communication Levels	Between Groups	9959.269	2	4979.635	15.579	0.000	C-A,B
	Within Group	205531.308	643	319.644			
	Total	215490.577	645				
Loneliness Score	Between Groups	207.172	2	103.586	2.244	0.017	C-A,B
	Within Group	29682.699	643	46.163			
	Total	29889.872	645				

A: 1-3 Hours; B: 4-6 Hours; C: 7-10 Hours.

The time spent playing online games is an important element for all three scales. According to Table 7, there is a statistically significant difference between the levels of digital game addiction of the students participating in the study with respect to spending time for playing digital games ($F_{(2;643)} = 17.642$, $p < 0.05$). A significant difference is found between the students who play digital games 7-10 hours per day ($\bar{x}_{7-10\ Hours} = 17.67$) and the students who play 1-3 hours per day ($\bar{x}_{1-3\ Hours} = 12.34$) and 4-6 hours per day($\bar{x}_{4-6\ Hours} = 14.\ 36$). Based on this finding, it can be inherently said that the levels of digital game addiction of students who play more games in a day are higher than those who play less games. In a similar sense, there is a statistically significant difference between the communication skill levels of the students according to the time of daily playing ($F_{(2;643)} = 15.579$, $p < 0.05$). Students whose daily playing time is between 7-10 hours ($\bar{x}_{7-10\ Hours} = 89.04$) have less communication skills while the students whose daily playing time is 1-3 hours ($\bar{x}_{1-3\ Hours} = 99.66$) and daily

playing time is 4-6 hours ($\bar{x}_{4\text{-}6\ Hours}$ = 95.15) have more skills. It is obviously seen that the level of communication skills of students who play more games in a day is lower than those who play less games. There is a statistically significant difference between the loneliness levels of the students based on the time they spent on digital games (F $_{(2;643)}$ = 2.244, p < 0.05). Students who play digital games 7-10 hours per day ($\bar{x}_{7-10\ Hours}$ = 49.59) feel more alone than the students who play digital games 1-3 hours per day ($\bar{x}_{1-3\ Hours}$ = 47.49) and the students who play games 4-6 hours per day ($\bar{x}_{4-6\ Hours}$ = 48.75). Based on this finding, it can be said that the level of loneliness of the students who play more games in a day is higher than the students who play less games.

Table 8. ANOVA test results of digital game addiction, communication skills and loneliness levels based on income level

		Sum of Squares	df	Mean Square	F	Sig (p)	Difference
	Between Groups	364.267	4	91.067	2.331	0.055	Not
Digital Game Addiction	Within Group	25041.648	641	39.067			
	Total	25405.915	645				
	Between Groups	1259.523	4	314.881	0.942	0.439	Not
Communication Levels	Within Group	214231.055	641	334.214			
	Total	215490.577	645				
	Between Groups	410.497	4	102.624	2.231	0.064	Not
Loneliness Score	Within Group	29479.374	641	45.990			
	Total	29889.872	645				

The income level has a sensitive point in digital game addiction, communication skills and loneliness. According to Table 8, there is no statistically significant difference between the levels of digital game addiction (F $_{(4;641)}$ = 2.331, p > 0.05), the communication skill levels (F $_{(4;641)}$ = 0.942, p > 0.05) and the loneliness levels (F $_{(4;641)}$ = 2.231, p > 0.05) of the students based on income level.

Table 9. ANOVA test results of digital game addiction, communication skills and loneliness levels based on number of siblings

		Sum of Squares	df	Mean Square	F	Sig (p)	Difference
	Between Groups	1845.940	4	461.485	12.556	0.000	E-A,B
Digital Game Addiction	Within Group	23559.974	641	36.755			
	Total	25405.915	645				
	Between Groups	8649.886	4	2162.471	6.702	0.000	E-A,D
Communication Levels	Within Group	206840.692	641	322.684			
	Total	215490.577	645				
	Between Groups	189.949	4	47.487	1.025	0.394	Not
Loneliness Score	Within Group	29699.923	641	46.334			
	Total	29889.872	645				

A: No Sibling; B: 1 Sibling; C: 2 Siblings; D: 3 Siblings; E: 4 or more Siblings.

According to Table 9, there is a statistically significant difference between the digital game addiction levels of the students according to the number of siblings (F $_{(4,641)}$ = 12.556, p< 0.05). A significant difference was found between the students who have 4 or more siblings ($\bar{x}_{4\ or\ more}$ = 11.87) and the students who have one sibling ($\bar{x}_{1\ Sibling}$=15.67) and no siblings ($\bar{x}_{No\ siblings}$ = 18.50). In accordance with this result, it is seen that the level of digital game addiction of the students with high number of siblings is lower than the students with low number of siblings. Having one or no siblings has a huge effect on digital gaming addiction. There is a statistically significant difference between the communication skill levels of the students according to the number of siblings (F $_{(4,641)}$ = 6.702, p < 0.05). A significant difference was found between students without siblings ($\bar{x}_{No\ siblings}$ = 81.50) and students with three siblings ($\bar{x}_{3\ Sibling}$=98.74) and more than three siblings $\overline{(x_{4\ or\ more}}$ = 98.48). In the lights of this result, it can be said that communication skill levels of students with high number of siblings are higher than students with low number of siblings. There is no statistically significant difference between the loneliness levels of the students based on the number of siblings based on F test score.

Table 10. Pearson's product-moment correlation analysis results of digital game addiction, communication skills and loneliness

n=646	Digital Game Addiction	Communication Level	Loneliness Level
Digital Game Addiction	1	-0.314 (0.000)	0.081 (0.040)
Communication Levels		1	-0.351 (0.000)
Loneliness			1

Pearson's Product-Moment Correlation is applied to the scale to evaluate the correlations. As seen in Table 10, there is a weak negative correlation between total scores of digital game addiction and communication skills (r = -0.341, p < 0.05). Accordingly, as the level of digital game addiction increases, communication skill levels of students decreases. Secondly, there is no correlation between the digital game addiction and loneliness level of students (r = .081, p < .05).

4. Discussion

There is a statistically significant difference between the levels of digital game addiction according to gender. It is seen that the average score of game addiction of male students is higher than female students. When the literature is examined, there are studies that are in line with the findings of the study (Lucas & Sherry, 2004; Huanhuan & Su, 2013; Irles & Gomis, 2015; Aydın & Horzum, 2015; Çavuş, Ayhan, & Tuncer, 2016; Eni, 2017; Aktaş, 2018; Bülbül, Tunç, & Aydil, 2018; Dursun & Eraslan-Çapan, 2018; Eryılmaz & Çukurluöz, 2018; Göldağ, 2018; Kurtbeyoğlu, 2018; Oral, 2018; Taylan, Topal, & Ayas, 2018; Yavuz, 2018). There are studies in the literature that do not find a significant relationship between gender and digital game addiction (Hsu, Wen, & Wu, 2009; Taş, Eker, & Anlı, 2014; Öncel & Tekin, 2015). In conclusion, in most of the studies on digital game addiction, it is seen that male students are more dependent than female students. These results are consistent with the findings. One of the main reasons for the higher level of game addiction for male students is their interest in technology. For male students, they play games at home and outside by using their mobile phones while female students usually prefer social media applications. While computer games are seen as an activity for girls to spend their free time, it is quite different for boys. Male students can build virtual identities through these digital games and it could be a problem in the future.

Another finding obtained in the study, there is a statistically significant difference between male and female students' communication skill levels. This differentiation is in favor of female. There are studies supporting these findings obtained in the literature review (Aküzüm & Gültekin, 2017; Aydın, Çelik, & Baş, 2017; Ocak, Karakuş, & Ocak, 2018). These results also showed that; females are more sensitive to their environment and can communicate better with people. There are studies that do not show parallelism with the findings obtained in the study (Gülbahçe, 2010; Elkatmış & Ünal, 2014; Ceylan & Mocan, 2017; Güney, 2017). In the study, there is a statistically significant difference between the loneliness levels of male and female students. It is seen that the loneliness levels of the female students are lower than the male students. There are studies supporting these findings (Demir, 1990; Haliloğlu, 2008; Çağır, 2010; Özkaya, 2017). There are studies that reach different results in the literature (Kozaklı, 2006; Özbek, 2017; Şanlı & Poyraz, 2018).

There is a statistically significant difference between the levels of digital game addiction of the students participating in the study according to the classes they enrolled. Based on the findings, it can be said that the levels of digital game addiction of first-year students were higher than those of third-year students. There are studies that are in line with the findings obtained in this study (Öncel & Tekin, 2015; Çakıcı, 2018; Kurtbeyoğlu, 2018). The student attending the university environment and being a new environment and not being able to make friends until they get used to it can lead the students to digital games. As the class level increases, the circle of friends expands, close friendships are established so that students may prefer to spend time with friends instead of digital games. However, studies that have obtained different results have been found in the literature review (Eryılmaz & Çukurluöz, 2018). One of the important results of the study is that there is a statistically significant difference between the communication skill levels of the students according to the classes they study. Based on these findings, it can be said that the communication skills levels of the first year students were lower than the second and third year students. Students coming to a different environment need time to get used to the environment and get to know each other. For this reason, it is natural for communication skills to be low in the first year. In the study of Gülbahçe (2010), the communication skills of the first grade students are lower than the upper grade students. However, there are also studies with different results (Yılmaz & Çimen, 2008; Dost, 2017).

There is no significant difference between the levels of loneliness of the students who participated in the study according to the grades. This result is in line with the findings of Çağır's (2010) study. One of the findings is that there is a statistically significant difference between the levels of digital game addiction of the students based on their mother's educational level. It can be said that the level of digital game addiction of the students whose mother education level is university is higher than the mother education level of primary school, middle school, high school, and illiterate. There are studies that are in line with our findings (Gökçearslan & Durakoğlu, 2014; Çakıcı, 2018). Such a result may be due to the fact that the mother with a high level of education has to work, is socially active and cannot take care of her child sufficiently. As a result, children are more unattended and more exposed to digital games. Eni (2017) reached different findings in his study.

The most interesting result is that the communication skill of the students whose mother education level is primary school is higher than the students whose mother education level is university. Some of studies show that the education level of the mother does not affect the communication skills of the students (Yılmaz & Çimen, 2008; Taşkın, 2012). There is a statistically significant difference between the loneliness levels of the students according to their mother's educational degree. The level of loneliness of the students whose mother is illiterate is higher than the students whose mother graduated from university. Kozaklı's (2006) study shows parallelism with these results, that is, the effect of maternal educational degree on loneliness perception.

Another finding obtained from the research is that the father educational degree makes a difference in the levels of digital game addiction among the students participating in the research. According to the data analysis, it can be seen that the level of digital game addiction of the students whose father educational degree is university is higher than the ones whose father educational degree are primary school and middle school. There are studies that have similar results in literature (Gökçearslan & Durakoğlu, 2014; Aktaş, 2018; Göldağ, 2018). The reason for this result is the increase in the education level of the families, especially in Turkey, but also the increase in the income level. This means more convenient access to technological devices such as computers, mobile phones and game consoles. Eni (2017) found a significant relationship between father's education level and digital game addiction. However, unlike the findings in this study, digital game addiction levels decrease as father education levels of high school students participate. On the other hand, Çakıcı (2018) found no relationship between father's educational degree and game addiction.

There is no statistically significant difference between the communication skill levels of the students according to their father's educational degree. Taşkın (2012) reached parallel results with this study. However, Yılmaz and Çimen (2008) obtained different results. Another finding of the study is that there is no statistically significant difference between the loneliness levels of the students according to the father's educational degree. In the literature, there are studies that obtain similar results (Kozaklı, 2006).

According to the data obtained, there is a statistically significant difference between the levels of digital game addiction of the students based on the time the students spent daily to play digital games. It can be said that the level of digital game addiction of the students who play more games in one day is higher than the students who play less games. There are studies in the literature that have the same results (Gökçearslan & Durakoğlu, 2014; Göldağ, 2018). There is a statistically significant difference between the communication skill levels of the students according to the daily playing time. It can be said that the level of communication skills of students who play more games in a day is lower than those who play less games and their loneliness levels are higher.

Another finding of the study is that the levels of digital game addiction of the students do not differ according to income level. There are studies in the literature emphasizing that monthly income variable is a significant difference (Taşkın, 2012). Bilgin (2015) found that digital gaming addiction levels decreased as monthly income levels increased. Eni (2017) has similar results as Bilgin. Göldağ (2018), on the other hand, found that students with high income levels had higher levels of digital game addiction than students with low income levels.

There is no significant difference in communication skills and loneliness levels of the students according to family income. When the literature is reviewed, studies conclude that the economic level is not an important factor on the level of loneliness which is similar to the findings of this study (Özbek, 2017; Şanlı & Poyraz 2018). However, there are also studies that obtained different results (Özkaya, 2017).

It is concluded that the level of digital game addiction of the students showed a significant difference according to the number of siblings. It can be said that the level of digital game dependence of the students with high number of siblings is lower than the students with less number of siblings. In addition, another finding reached in this study is that the communication skills levels of the students with high number of siblings are higher than the students with low number of siblings. There is no statistically significant difference between the loneliness levels of the students according to the number of siblings. There are studies supporting the findings (Demir, 1990;

Kozaklı, 2006).

There is a weak negative correlation between the total scores of digital game addiction and communication skills of the students. Accordingly, as the level of digital game addiction increases, communication skill levels of students decreases. However, there is no statistically significant correlation between the total scores of digital game addiction and loneliness scores of the students. This may be the reason why the students participating in the research do not feel alone as their digital game addictions increase. Çelik and Ulusoy (2019) reported that 51.3% of the students who participated in the study never felt lonely while playing computer games. Aydın and Horzum (2015) found that game addiction is not predicted by extraversion, softness, self-control and openness to experience. Another study that does not show parallelism with the findings obtained is the study of Yılmaz and Karaoğlan-Yılmaz (2018). In this study, it was found that there was a low level positive relationship between online game addictions and perceptions of feeling alone. However, Öncel and Tekin (2015) found that loneliness was lower in children with high levels of play addiction.

5. Conclusion

The aim of this study is to investigate the effects of digital game addiction levels on level of loneliness and perception of communication skills by using demographic variables. 356 female and 290 male students from İnönü University participated in this study.

In fact, it is thought that individuals who are addicted to digital games feel lonely and cannot establish social relations with their environment. But with today's technology, individuals are able to play and chat with the spirit of being a team by coming together online, even if they are in different places.

It is impossible not to use technology which is indispensable in our lives with its positive or negative aspects. However, controlling the use of these technologies is becoming more important. It is necessary to try to minimize its harmful effects. With improvement of new computer software and hardware, digital games have become more realistic and remarkable. Nowadays, people prefer to computer games instead of face-to-face communication. With each passing day technology, digital gaming, mobile phone addictions are becoming widespread. Such addictions are like illness of this age. It causes an increase in stress and anxiety levels in people, negativity in relationships with people around them, excessive irritability, involuntary aggressive thoughts and problems that affect life negatively. It is considered that such studies are important for parents, teachers and authorities to be aware of these dangers and to be effective in program development studies on this issue.

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