Investigating Psychological Effects of E-sports Games on Players

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Abstract: E-sports games have recently become a popular internet game especially among young people and are played at a professional and amateur level. The effect of replacing traditional games with such digital games on the development of children and young people is hotly discussed among the parents and educators. This study aims to investigate psychological problems of players arising from playing e-sports games. The research was designed with a survey model. The sample consisted of 100 players that were accessed over the internet. The data were collected using an electronic questionnaire prepared by adapting the computer games addiction scales. The majority of the participants are high school students and their average age is 17.5 years. About half of them have e-sports experience of five years and above. It is seen that the participants have low level addiction problems in the dimensions of "associating e-sport with real life" and "neglecting responsibilities because of e-sport" and medium level addiction problems in the dimensions of "preferring e-sport to other activities" and "can not giving up e-sport". Gender, age and school type have no effect on these dimensions.

Keywords: Electronic games, E-sport, Psychological effects, Addiction, Youngsters

Introduction

As a result of rapid developments in the digital age and related transformative effects, the concept of traditional sports has been changed just like the other activities and the concept of e-sports has entered our lives. E-sports is the abbreviation of electronic sports. Over the last decade, as a new kind of sports, it has become one of the most popular activities, especially in adolescents and emerging adult culture. Since it is still a developing concept, there are a few definitions of e-sports in the literature. For example, Wagner (2006) defines it as a sports activity where people improve their physical and mental skills through information and communication technology (ICT). According to Rosell (2017) it is playing video or computer games in a competitive environment based on the rules. For Newzoo (2018) it includes meeting of players towards a specific goal in a tournament based on mutual competition over the computing networks. Within the framework of these definitions, Büyükbaykal and İli (2020) state that it is a sport emerging from the cooperation of entertainment

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and sports and it is based on mutual competition, played individually or as a team through various electronic devices, including sponsors, organizers and viewers. All these definitions indicate that the concept of e-sports includes ICT, sports and entertainment.

E-sports games are developed as highly interactive virtual environment accessed by digital devices and they allow players to take control of a person or an object and perform functions specific to each game. They are usually played either individually or in teams for an award or title. E-sports games are often organized as national or international amateur or professional tournaments that involve sponsors, organizers and viewers/fans (Akın, 2008). Back in the days video games were only played for recreation and entertainment and the only viewers were friends, siblings and family members but over the years the reach of video games has become widespread with high viewership. Nowadays millions of fans watch e-sports daily and support their favorite teams at stadiums.

Not all computer games can be regarded as e-sports. E-sports games can be divided into several categories such as First-Person Shooter (FPS), Multiplayer Online Battle Arena (MOBA), Massively Multiplayer Online Games (MMOG), Role Playing Games (RPG) and Sport Games (Büyükbaykal & İli, 2020). FPS games (e.g., Call of Duty, Halo, Counter Strike) involve the player taking control of a character holding a handgun or other form of projectile, which is usually the central focus of the game. MOBA games (e.g., League of Legends, Defense of the Ancients) are strategy-based video games in which two teams compete against each other on a predefined battlefield. MMOG (e.g., World of Warcraft) are often played on the same computer server with hundreds or thousands of players. RPG (e.g., Star Wars) involve the player taking control of a character in a fictional virtual setting. Sport games (FIFA, Football Manager) are traditional sports branches adapted to virtual environments.

E-sport games have recently become a popular internet game especially among young people. According to data comes from NewZoo, which is the world's most trusted and quoted source for games market insights and analytics, e-sports audience increased from 395 million viewers in 2018 to 454 million the following year, expecting that by 2022 the audience will exceed 645 million viewers (Pannekeet, 2019). More than half of these are from Asia-Pacific region where e-sports is very popular. Even though e-sports was not so popular in the beginning, in recent years it has turned into a billion-dollar industry. As the number of spectators increased, the revenues of this industry increased as well. According to Newzoo statistics, in 2018 earnings from e-sports amounted to over $865 million, reaching $1.1 billion in 2019 and projected to increase to almost $1.8 billion in 2022 (Pannekeet, 2019).

The potential consequences of playing e-sports on both the development and future of the new generations have been noted and debated by scholars, educators as well as parents. There is a growing public concern and discussion about these games. However, there is no agreement about the effects of e-sports among the experts and their study results. Some show that playing e-sports may result in increases brain stimulation, developing critical thinking skills, quick reactions (increasing hand-eye coordination), having fun, relieving stress, making

money, on the other hand, some indicate that high involvement in these games may lead to time management problems, sleep deprivations, weight gain, obesity, physical complaints (e.g., eye straining, backache), increase in aggressive behavior, rash decision-making, and addiction (Can & Tekkurşun Demir, 2020; Saito, Isogai & Takahashi, 2021; Sarper Kahveci, 2020). Of course, it is not possible to make final and certain judgments because there is not enough research on these consequences. A recent bibliometric analysis of previous research studies conducted in the last 15 years indicates that the number of studies conducted on e-sports in the last five years increased and are more than the previous years (Büyükbaykal & İli, 2020). The most research on this subject is from China, United States, South Korea and Germany, where e-sports games are very popular and related sector is developed. This topic and related studies are still in their development stages. There is a need for more studies especially in different cultures and populations in the word to make final assertions.

The effect of replacing traditional games with such digital games on the development of children and young people is hotly discussed among the parents and educators. However, while the studies in the literature focus on addiction and muscle and skeletal problems caused by intense internet usage, they are limited in terms of the psychological and physical effects of e-sport games on the players. Therefore, in this study, it was aimed to investigate the psychological problems of the players arising from playing e-sports games and their relationships with some demographics. In order to fulfill this purpose, the following research questions were formed:

- To what extend are players addicted to e-sports games?
- Do their addiction levels differ across gender and education level?
- Are their addiction levels related to age?

Method

Since this research explores the current state of the potential psychological consequences of e-sports players based on their self-report data from a descriptive point of view, it was designed with survey research model within the quantitative research methods. Survey studies are generally conducted to explore how opinions, attitudes, or characteristics are distributed in the sample, a part or the whole of the target population, rather than how they originate (Buyukozturk, Kilic, Cakmak, Akgun, Karadeniz & Demirel, 2011). They aim to reveal the existing situation on a particular subject, to explain, compare and describe attitudes and behaviors (Karasar, 2012). Within the framework of this research methodology, this study was structured in a quantitative research context that includes data collection within a scale.

The population of this research includes amateur and professional level e-sports gamers living in Turkey. Using a criterion-based convenience sampling, the sample comprised 100 volunteer gamers accessible over the Internet. This sampling method adds speed and practicality to research because the researcher chooses a situation that is close and easy to access (Büyüköztürk et al., 2011).

The data were collected using an electronic questionnaire that was shared with players on the related Internet forums and social media platforms. In the first part of the questionnaire form there were some questions to solicit personal information and gaming profile. During the examination of related literature, no specific scale was found to measure the psychological effects of e-sports games on players. Thus, the Computer Games Addiction Scale (CGAS) by Horzum, Ayas and Çakır Balta (2008) was adapted to e-sports games. The CGAS has a total of 21 5-point Likert-type items (1=completely disagree, 5=completely agree). The items are grouped under four main dimensions: inability to stop e-sports and be bothered when blocked, dreaming of e-sports and associating it with real life, neglecting responsibilities due to e-sports, and preferring e-sports to other activities.

Results

Of the participants, 86% of them were male and 14% were female players. The majority of the participants (84%) are high school students while the remaining slight parts (16%) are university students. The ages of the participants ranged from 15 and 27 and the mean age was 17.54 years (SD=2.72). Regarding e-sports experience, 23% have been playing e-sports games for less than a year, 32% for 1-4 years, and 45% for five years and above. The frequency of weekly e-sports gaming was distributed as follow: 1-10 hours (54%), 11-20 hours (24%), and 21 hours and more (22%).

The participants' item scores in the CGAS were summed up for each dimension to calculate dimension scores. After this, the mean scores and standard deviation of each dimension in the CGAS were calculated and presented in Table 1. The mean score for the "inability to stop e-sports and be bothered when blocked" dimension was 30.38 (SD=6.26) while the actual scores ranged from 9 to 43. The mean score for the "dreaming of e-sports and associating it with real life" dimension was 9.31 (SD=3.26) while the actual scores ranged from 4 to 17. The mean score for the "neglecting responsibilities due to e-sports" dimension was 7.28 (SD=2.57) while the actual scores ranged from 3 to 13. The mean score for the "Preferring e-sports to other activities" dimension was 10.40 (SD=3.18) while the actual scores ranged from 4 to 19.

Table 1. Participants' Addiction Scores

Addiction dimension	Min	Max	Mean	SD
Inability to stop e-sports and be bothered when blocked	9	43	30.38	6.26
Dreaming of e-sports and associating it with real life	4	17	9.31	3.26
Neglecting responsibilities due to e-sports	3	13	7.28	2.57
Preferring e-sports to other activities	4	19	10.40	3.18

Independent-samples t-tests were conducted to compare participants' addiction scores across gender (Table 2). There was no significant difference [$t_{(98)}$=1.42, p>.05] in "inability to stop e-sports and be bothered when blocked" addiction dimension between males (Mean=30.02, SD=6.45) and females (Mean=32.57, SD=4.52). There was no significant difference [$t_{(98)}$=1.21, p>.05] in "dreaming of e-sports and associating it with real life"

addiction dimension between males (Mean=9.15, SD=3.21) and females (Mean=10.28, SD=3.50). There was no significant difference [$t_{(98)}$=.79, p>.05] in "neglecting responsibilities due to e-sports" addiction dimension between males (Mean=7.20, SD=2.64) and females (Mean=7.79, SD=2.08). There was no significant difference [$t_{(98)}$=.79, p>.05] in "preferring e-sports to other activities" addiction dimension between males (Mean=10.29, SD=3.23) and females (Mean=11.07, SD=2.78).

Table 2. Comparison of Participants' Addiction Scores by Gender

Addiction dimension	Gender	N	Mean	SD	t	p
Inability to stop e-sports and be bothered when blocked	Male	86	30.02	6.45	1.42	.16
	Female	14	32.57	4.52		
Dreaming of e-sports and associating it with real life	Male	86	9.15	3.21	1.21	.23
	Female	14	10.28	3.50		
Neglecting responsibilities due to e-sports	Male	86	7.20	2.64	.79	.43
	Female	14	7.79	2.08		
Preferring e-sports to other activities	Male	86	10.29	3.23	.85	.40
	Female	14	11.07	2.78		

Independent-samples t-tests were also conducted to compare participants' addiction scores across education level (Table 3). There was no significant difference [$t_{(98)}$=1.45, p>.05] in "inability to stop e-sports and be bothered when blocked" dimension between high school (Mean=30.77, SD=6.04) and university students (Mean=28.31, SD=7.18). There was no significant difference [$t_{(98)}$=.75, p>.05] in "dreaming of e-sports and associating it with real life" dimension between high school (Mean=9.41, SD=3.25) and university students (Mean=8.75, SD=3.38). There was no significant difference [$t_{(98)}$=-.27, p>.05] in "neglecting responsibilities due to e-sports" dimension between high school (Mean=7.25, SD=2.61) and university students (Mean=7.44, SD=2.42). There was no significant difference [$t_{(98)}$=.89, p>.05] in "preferring e-sports to other activities" dimension between high school (Mean=10.52, SD=3.25) and university students (Mean=9.25, SD=2.79).

Table 3. Comparison of Participants' Addiction Scores by Education Level

Addiction dimension	Education	N	Mean	SD	t	p
Inability to stop e-sports and be bothered when blocked	High school	84	30.77	6.04	1.45	.15
	University	16	28.31	7.18		
Dreaming of e-sports and associating it with real life	High school	84	9.41	3.25	.75	.46
	University	16	8.75	3.38		
Neglecting responsibilities due to e-sports	High school	84	7.25	2.61	-.27	.79
	University	16	7.44	2.42		
Preferring e-sports to other activities	High school	84	10.52	3.25	.89	.38
	University	16	9.25	2.79		

When Pearson correlation coefficients were calculated, it was revealed that players' age was not significantly associated with "inability to stop e-sports and be bothered when blocked" (r=-0.18, p>.05), "dreaming of e-sports and associating it with real life" (r=-0.05, p>.05), "neglecting responsibilities due to e-sports" (r=-0.01, p>.05), and "preferring e-sports to other activities" (r=-0.13, p>.05) dimension scores.

Conclusion

Participating e-sports players in this study have low level addiction problems in the dimensions of "associating e-sport with real life" and "neglecting responsibilities because of e-sport" and medium level addiction problems in the dimensions of "preferring e-sport to other activities" and "cannot giving up e-sport". They show some symptoms of both cognitive and behavioral occupation with e-sports and unsuccessful efforts to control e-sports gaming behaviors. Individual item scores of the CGAS suggest that there seems to be a displacement effect of e-sports gaming on participants' other activities (e.g., going out, hanging with friends, sports). Players' addiction problems are not dependent on their gender, age and education level. In order for e-sports players to be less psychologically affected by e-sports games, time arrangements can be made regarding playing e-sports games; since young players may start living in the world of games, it can be emphasized that the games are independent from the real world by ensuring their socialization; it should be ensured that the players focus their attention on their main responsibilities; and e-sports players can be directed to normal sports and by this way supporting their psycho-social and physical development.

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