SUJE
ISSN: 2146-7455

Received : 02.11.2022
Published : 10.03.2023
Available Online : 30.04.2023

SAKARYA UNIVERSITY

The Effect of Cognitive Behavioral Play Therapy Based Psycho-Education Program on the Level of Violent Content Digital Game Addiction and Aggressiveness

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Abstract

Cognitive-behavioral play therapy-based psycho-education program is important because it shows that this type of intervention can reduce levels of violent content digital game addiction and aggressiveness in adolescents. This has implications for the development of effective prevention and intervention strategies and highlights the benefits of integrating play therapy and psycho-education techniques in treating addiction and aggression in youth. The main aim of this investigation is to examine the effect of cognitive-behavioral play therapy-based psycho-education program on the level of addiction to digital games with aggressive content and aggressiveness in children. The study was conducted with 219 students from 4th grade in a primary school in Turkey in 2020. The research, that has an experimental design, has one independent variable which is the cognitive-behavioral play therapy-based psycho-education program and two dependent variables which are digital game addiction and aggressiveness scores. Data was collected through "The Computer Game Addiction Scale for Children" and "Aggressiveness Scales". Data was analyzed by using the SPSS 22.00 packet program. According to the study findings, cognitive-behavioral play therapy-based psycho-education program was found to have a significant effect on the level of digital game addiction and aggressiveness in the experimental group. However, a positive and high-level correlation was found between digital game addiction and aggressiveness through the correlation analysis. Finally, the findings of the study were discussed in the light of the relevant literature, and recommendations were made for further research.

Keywords

Cognitive behavioral play therapy, Psycho-education, Digital game addiction, Aggressiveness, Children.

Ethics Committee Approval: Ethics committee permission for this study was obtained from Sakarya University Ethics Committee with the decision dated 04.11.2020 and numbered 28/17.

Suggested Citation: Söylemez, A., & Ayas, T. (2023). The Effect of Cognitive Behavioral Play Therapy Based Psycho-Education Program on the Level of Violent Content Digital Game Addiction and Aggressiveness. *Sakarya University Journal of Education, 13*(1), 68-83. doi: https://doi.org/10.19126/suje.1196533

Note: This study is derived from a doctoral dissertation prepared by the first author under the supervision of the second author.

iThenticate The similarity rate determination of this study was carried out using iThenticate software.

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INTRODUCTION

It can be assumed that one of the most important and an influential invention of the post-modern world is the innovation of the internet. A significant purpose of the internet is also to play online games depending on the age and gender groups, even adults. Games are a way of expressing thoughts and emotions and experiences by children (Crenshaw & Stewart, 2017). Games played by children are basically divided into two separate areas; physical and virtual. In this study, the subject will be discussed based on games played in the virtual platform. Ögel (2012) classifies digital games as action, adventure, fighting, riddle, entertainment, role, simulation, sports, strategy and mission games. Another research by Burak and Ahmetoğlu (2015) found that 64.25% of students playing digital games prefer violent games in their study at primary school level. According to these study findings, it can be said that the rate of users who prefer violent games among these game types has increased significantly.

Apart from game types with violent content, there is a crucial matter with the limit of games. Twenge (2018) has asserted that adolescents spend 1.5 hours with digital games in a routine day. Another research realized by ESA (2018) showed that 30% of digital gamers are individuals under the age of 18, which is accepted by the UN (1989) as a child. Judging by the type of game played, fighting and action games account for 35% and 28% of all digital games. In this context, it can be said that the games that children prefer in the digital platform mostly contain violence and action. Furthermore, both Anderson and Dill (2000) and Gentile et al. (2004) found in their studies that adolescents who prefer violent digital games exhibit more aggressive behaviors and have lower school success. The results of these studies prove that the preferred game type is related to the behavioral style.

On the other hand, there are some statistically proven studies about the positive aspects of digital games played by children at the same time. Entertainment Software Association (ESA) (2018) states that 55% of video game players connect with their friends thanks to these games, and 46% contribute to spending time with their families. Actually, it is not a big problem that a child plays virtual games in the digital environment exactly, the main problem is the unlimited duration of games. Individuals, especially children, can lose their individual control in terms of time and content with the effect of the attractiveness of the game while playing games in the virtual environment. Ofcom (2018) has stated that 74% of children aged 8-11 play computer games and spend an average of 10 hours a week playing online games. If the game is played in an unlimited way, by losing track of time, this can also lead to an addiction problem. Game addiction can be defined as excessive gaming, which negatively affects health, academic faculties, and daily life of children (Horzum, 2016). The problem here is not with playing the game but with the style of game and the duration dedicated to it.

Although addiction is generally considered as an extreme tendency towards any chemical substance such as cigarettes or alcohol in the psychology literature, it is possible for the individual to spend excessive time on a certain object without any drugs (Griffiths, 2012). Therefore, technology incorporates addiction elements that can be considered in this context because it can turn into an addictive behavior. However, at the 72nd World Health Council meeting held in 2019, WHO (2021) included digital gaming addiction, which has similar epidemiological, neurobiological, and symptomatic similarities with gambling addiction, into the category of disorders related to behavioral addictions. Griffiths (1996) claims that the concept of behavioral addiction is not quite different from other substance addictions in terms of dependency and that it should be treated in the same manner.

Behavioral addiction consists of six components: attractive goals at a distance, irresistible and unpredictable positive feedback, an increased sense of growth and progress, tasks that gradually become more difficult over time, tensions that require resolution, and strong social connections (Alter, 2018). With observations and statistical instruments, most of these components can be shown among the characteristics of individuals with digital game addiction.

Significant study around the world has put forward game users' expressing aggressive behavior (Kılıç, 2019), a positive relationship between obesity and digital games (Muslu & Gökçay, 2019), and social anxiety in game users (Karaca at. all, 2016). Voltan Acar (2015) describes psycho-education as groups which aim to change target behavior with cognitive-oriented techniques. Apart from this, Yalom (2015) assesses psycho-education as closed groups because of its construction of time and person limitations.

The use of play in therapy was first discussed by the pioneers of child psychotherapists such as Anna Freud (1928, 1964, 1965), Margaret Lowenfeld (1935, 1970) and Melanie Klein (1961, 1987). The term of play therapy is defined by Association of Play Therapy (2021) as the systematic use of a theoretical model to establish an interpersonal process using the therapeutic powers of play in order to help clients prevent or solve psycho-social difficulties and achieve optimal growth and development.

Aggressiveness

Aggressiveness is one of the most referred words that relate to digital games in the studies. Myers (2010), who explains aggression with instinctive theory, frustration theory, and social learning theories, defines physical or verbal behavior that causes harm to someone as aggression. Gerrig and Zimbardo (2018) on the other hand, define aggression as behavior that would cause psychological or physical harm to others. Accordingly, physical aggression represents situations where the child gets into a fight or hits, bites, or kicks another child, while social aggression refers to situations where the child spreads bad rumors about someone else or makes others dislike a particular classmate.

In the meantime, some researchers evaluated the concept of aggression under the category of behavioral disorders (Austin & Sciarra, 2012). Apart from that, Dattilio and Freeman (2017) who are from the school of thought that put forward cognitive psychology theory, dealt with the term aggression mainly in two groups: reactive and proactive. Reactive aggression is the type of aggression created by anger and frustration; whereas in proactive aggression, physical pain is not the ultimate goal. To illustrate this situation, removing the device on which the child wants to play digital games may cause reactive aggression. In this context, just like other psychological problems, aggression also has some treatment plans in order to reduce the bad effects on children who bear any potential of impulsive aggression. Although aggression can be treated as a single disorder or in relation with others such as digital game addiction, treatments can be developed. Cognitive or behavioral approaches, and family interventions are the main components of a comprehensive program designed for the treatment of aggressive children. Therefore, in this study cognitive-behavioral play therapy was used for addiction to digital games with aggressive content.

Cognitive-behavioral play therapy (CBPT)

Knell (2009) shaped the principles of cognitive-behavioral play therapy by adapting to Beck's cognitive therapy principles, as presented below;

Cognitive-behavioral play therapy is based on the cognitive model of emotional problems.

Cognitive-behavioral play therapy is short and time limited.

The therapeutic relationship is a necessary condition for the effectiveness of cognitive-behavioral play therapy.

Cognitive-behavioral play therapy is based on collaboration between the therapist and the child.

Cognitive-behavioral play therapy uses the Socratic questioning method for the purpose of externalizing the client.

Cognitive-behavioral play therapy is structured and goal-directed.

Cognitive-behavioral play therapy is problem-centered.

Cognitive-behavioral play therapy is based on an educational model.

Cognitive-behavioral play therapy uses an inferential and deductive technique.

Cognitive-behavioral play therapy uses homework in therapy sessions effectively.

In addition to these, CBPT uses cognitive restructuring, problem solving, systematic desensitization, role-playing, exposure, relaxation techniques, bibliotherapy and psycho-education in the therapy phase with children (Knell & Dasari, 2009). All these therapeutic techniques have been used in available research when the psycho-education program was conducted. Besides that, Knell and Dasari (2016) suggested in a different study that initiation, evaluation, treatment, and termination stages were taken as basis when applying CBPT, respectively. Finally, the main purpose of this study is to decrease the level of digital game addiction and aggressiveness in the primary school children.

METHOD

This study was carried out in a mixed practice of 2x3 (experimental/control group X test-posttest-follow-up test) of the pre-group real trial types. The 1st factor of the design is independent (experimental-control groups), the 2nd factor of the design is three repetitive measurements (pre-post-follow-up test) of the dependent variable (Büyüköztürk et al., 2008). The independent variables are changed by the experimenter while the dependent variable is the response measurement of the experiment, which depends on the response of the subject in the changing environment (Kantowitz et al., 2009). The independent variable of the study is the psycho-educational program based on CBPT, and the dependent variable is the scores obtained from the scale of computer game addiction in children and aggression scale.

Participants

The participants of this study were determined by applying the Game Addiction Scale for Children to 219 students attending 4th grade of primary school. The control and experimental groups were determined by assigning 30 people with the highest scores in the risky and dependent category for the study group, one by one, to the 1st and 2nd groups from 2 separate groups. In order to avoid interaction between individuals, attention was paid to the fact that the class branches of the students were different. In the preliminary interview with 30 students, the scope and content of the study to be carried out were explained in detail. 5 of the 15 students determined as the control group were excluded from the study group in line with their own or their families' wishes. On the other hand, 3 people from the experimental group were excluded from the study group because they did not volunteer and 2 of them did not attend the first 3 sessions after the psycho-education program started.

Thus, the study was conducted with 20 participants, all of whom were male, 10 in the experimental group and 10 in the control group.

Procedure

All parents were informed about the purposes and the process of the study. In the beginning of the study, participants also completed all the instruments that are used in the study in their natural environment as a pretest. After 10 weeks, the psycho-education program was completed and the posttest procedure was implemented to the participants. Subsequently, after 3 months, the follow-up test was realized in order to test the effect of the psycho-education program in the long term. The time and subject table that was prepared for the implementation process of the CBPT-based psycho-education program is presented below.

Table 1

Group session number, name, date and duration

Session number	Session name	Date	Duration
Parent session 1	Giving information on plan	02/01/2020	90 minutes
Pre-interview	Information and contract	03/01/2020	30 minutes
Session 1	Meeting each other	06/01/2020	60 minutes
Session 2	Exposure to the problem	13/01/2020	60 minutes
Session 3	ABC technique	03/02/2020	60 minutes
Session 4	Effective time management	10/02/2020	60 minutes
Session 5	Improve motivation	17/02/2020	60 minutes
Session 6	Creating behavioral change	24/02/2020	60 minutes
Session 7	Acquisition of self-management	02/03/2020	60 minutes
Session 8	Behavior orientation	09/03/2020	60 minutes
Session 9	Behavior reinforcement	11/03/2020	60 minutes
Session 10	Termination of psycho-education	19/03/2020	60 minutes
Parent session 2	Evaluation	23/03/2020	60 minutes

Instruments

At the beginning of the study, a demographic questionnaire was used in order to determine some features of the participants like age, gender and class. Furthermore, Computer Addiction Scale for Children by Horzum, Ayas and Çakır-Balta (2008) and Aggressiveness Scales (Şahin, 2004) were used in order to determine the participants' level of game addiction and aggressiveness, in beginning, ending, and follow-up stages of the psycho-education program.

Computer Game Addiction Scale for Children (Horzum, Ayas, & Çakır-Balta (2008)

The purpose of CGASC, which was developed by Horzum et al. (2008), is to determine the computer game addictions in primary school and above. The scale, consisting of a total of 24 items, was conducted with 460 students from different socio-economic statuses attending in Trabzon. The scale has been determined as 4 factors: not being able to give up playing games on the computer and being disturbed when blocked, keeping the computer game alive in one's dreams and associating it with real life, disrupting tasks due to playing computer games, and preferring playing games to other activities.

Lastly, with the value of .85, Cronbach's Alpha internal consistency coefficient of the scale meets the psychometric qualities.

Aggressiveness Scales (Şahin, 2008)

The aim of this measurement tool developed by Şahin (2008) is to determine the aggression levels of children aged 10-11 based on social learning and cognitive theory. The scale, consisting of 18 items, was carried out with a total of 450 students attending 4th and 5th grades in Primary Schools in the city of Burdur, which were determined by cluster sampling method. The validity and reliability scores, calculated as .77 Cronbach's Alpha coefficient, show that the scale can be used to determine the aggression levels of children aged 10-11.

Statistical Analysis

The collected data was analyzed with the SPSS 22.00 package program. In the analysis of the data, the value of .05 was taken as the significance score. In this context; a two-factor ANOVA test was used to decide whether the change observed in repeated measures of the effect of the experimental procedure on the dependent variables (game addiction and aggression) was of significant difference between the experimental and control groups. Therefore, statistical analyses were performed against the violation of the assumptions (normal distribution, homogeneity, and sphericity) of the two-factor ANOVA test of the data set (Shavelson, 2016). In the analysis process of the research design, Shapiro-Wilks test for normal distribution, Levene test for homogeneity, Box's M for equality of covariance, and Mauchly's Test of Spherecity analysis tests were performed to decide the independence of difference scores calculated in terms of sphericity.

Ethical Principles

Ethics committee permission for this study was obtained from Sakarya University Ethics Committee with the decision dated 04.11.2020 and numbered 28/17.

FINDINGS

Table 2

Shapiro-Wilks Normality Test Results on Digital Gaming Addiction

Dependent Variable	Group	Measure	Shapiro-Wilks Statistic	sd	p
Game addiction	Experiment	Pre-test	.758	10	.004
		Post-test	.959	10	.773
		Follow-up test	.884	10	.144
	Control	Pre-test	.866	10	.089
		Post-test	.939	10	.547
		Follow-up test	.929	10	.442

According to Shapiro-Wilks normality test, it will be observed that the dependent variable has a normal distribution in all subgroups (except from pretest of experimental group) separately ($p > .05$). The results related to homogeneity assumption have been presented in Table 3.

Table 3

Levene, Box's M and Spherecity Test Results on Homogeneity of Variances and Equal Covariances of Groups

Groups	Variable	Levene				Box's M			Spherecity Test	
		F	sd1	sd2	p	İstatistik	F	p	Mauchly's W	p
Experiment and Control	Pre-test	.127	1	18	.725					
	Post-test	.051	1	18	.828	4.954	.674	.670	.878	.330
	Follow-up	.103	1	18	.752					

When Table 3 is examined, it will be seen that the variances of the scores obtained from the groups were equal through Levene test ($p > .05$), the covariances of the groups are equal for binary combinations of measurement sets via Box's M test ($p > .05$), and spherecity assumption test with Mauchly's W ($p > .05$). When all these findings are evaluated in general, it can be concluded that the data set meets the two-factor ANOVA assumptions.

Table 4

Arithmetic Mean and Standard Deviation Values of Digital Game Addiction Scale for Experimental and Control Groups

Group	Pre-Test			Post-test			Follow-up Test		
	N	$\bar{x}$	SS	N	$\bar{x}$	SS	N	$\bar{x}$	SS
Experiment	10	62,70	10,63	10	45,30	9,26	10	40,70	10,17
Control	10	66,90	10,60	10	61,20	11,24	10	67,90	8,98

When Computer Game Addiction Scale is examined in the way of pretest, posttest and follow-up test scores for experimental and control groups; pretest scores mean for experimental group is X = 62.70, posttest score mean is X = 45.30, and follow-up test mean is X= 40.70; pretest scores mean for control group is X = 66.90, posttest score mean is X = 61.20, and follow-up test mean is X = 67.90. According to these findings, when the mean score of computer game addiction of the experimental group is compared with the pretest scores, a significant decrease is noticed in the mean scores of the posttest and follow-up tests. In terms of control group, on the other hand, although there was a very low decrease in the posttest mean scores when compared to the pretest, follow-up test mean scores increased again, reaching a higher mean than the pretest mean scores. Although, an inference about the increasing and decreasing in the mean scores of the findings in the descriptive analysis table is possible, it was obtained from ANOVA tests for repeated measures whether this difference is significant.

Two-factor ANOVA test results of the data set whose assumptions were met have been presented in Table 4.

Table 5

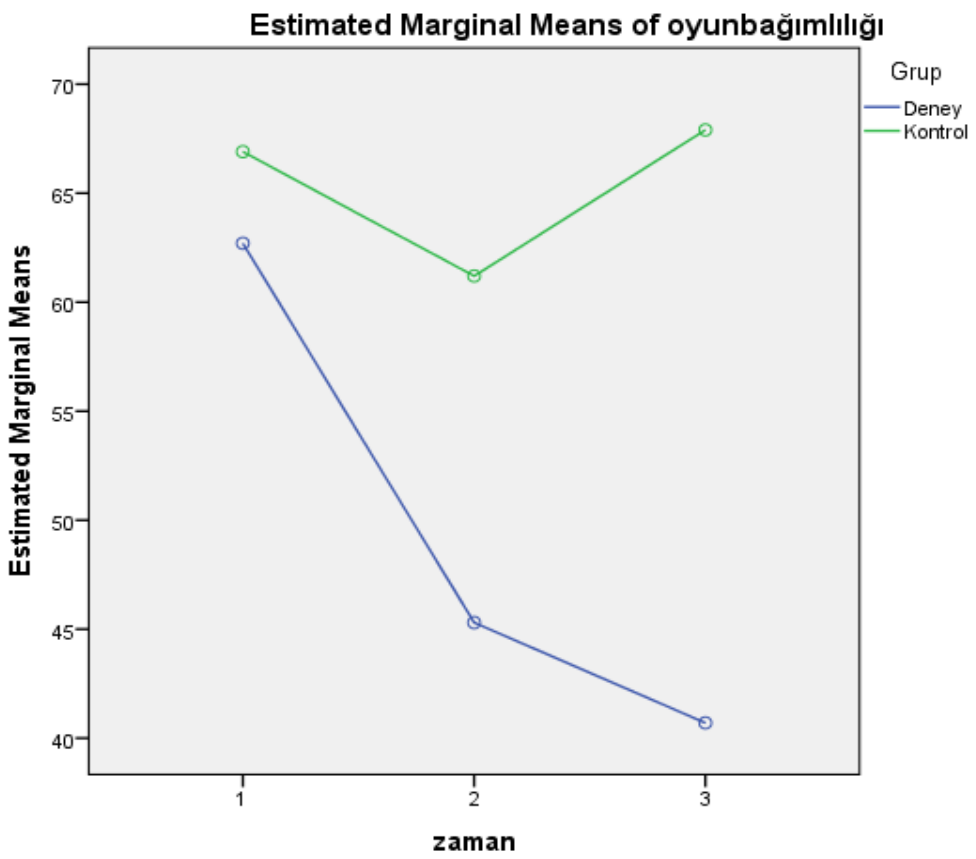
ANOVA Results of Game Addiction Scale Pretest, Posttest, and Follow-up Test Scores

Resource of Variances	Sum of Square	Sd	Average square	F	*p*	Partial Eta-Kare
Intergroup intervention	2380,950	19				
(Experiment-Control)	1242,939	1	1242,939	19,660	,000	,522
Error	1138,011	18	63,223			
In-group	6290	20				
Time (Pretest-Posttest-Follow-up)	2668,050	1	2668,050	16,546	,001	,479
Intervention*Time	638,450	1	4,245	7,189	,015	,285
Error	2902,500	18	161,250			
Total	8670,95	39				

Partial eta-squared value was found as .479 in ANOVA table. It can be said with this value that the %47,9 of the variation in the dependent variable of computer game addiction was explained by the time variable.

Figure 1

Game addiction mean score graph of the experimental and control groups from the pretest, posttest and follow-up measurements



It is seen at the Table that cognitive behavioral play therapy-based psycho-education program has a decreased effect on the digital game addiction level of experimental group as after experiment and following process. This change is not necessary for the control group. Consequently, findings related to the digital game addiction support the idea of psycho-educational program is effective in decreasing the level of digital game addiction.

Table 6

Paired Comparison of Aggression Pre-Post and Follow-Up Tests Scores of Experimental and Control Groups (Bonferroni Compatible) Post-Hoc Analysis Results

		Experiment		Control	
		Pre-test Average Fark I-J	Post-test Average Fark I-J	Pre-test Average Fark I-J	Post-test Average Fark I-J
Experiment	Pre-test		2.100	-4.200	
	Post-test	-2.100			-4.200
Control	Pre-test	4.200			2.100
	Post-test		4.200	-2.100	

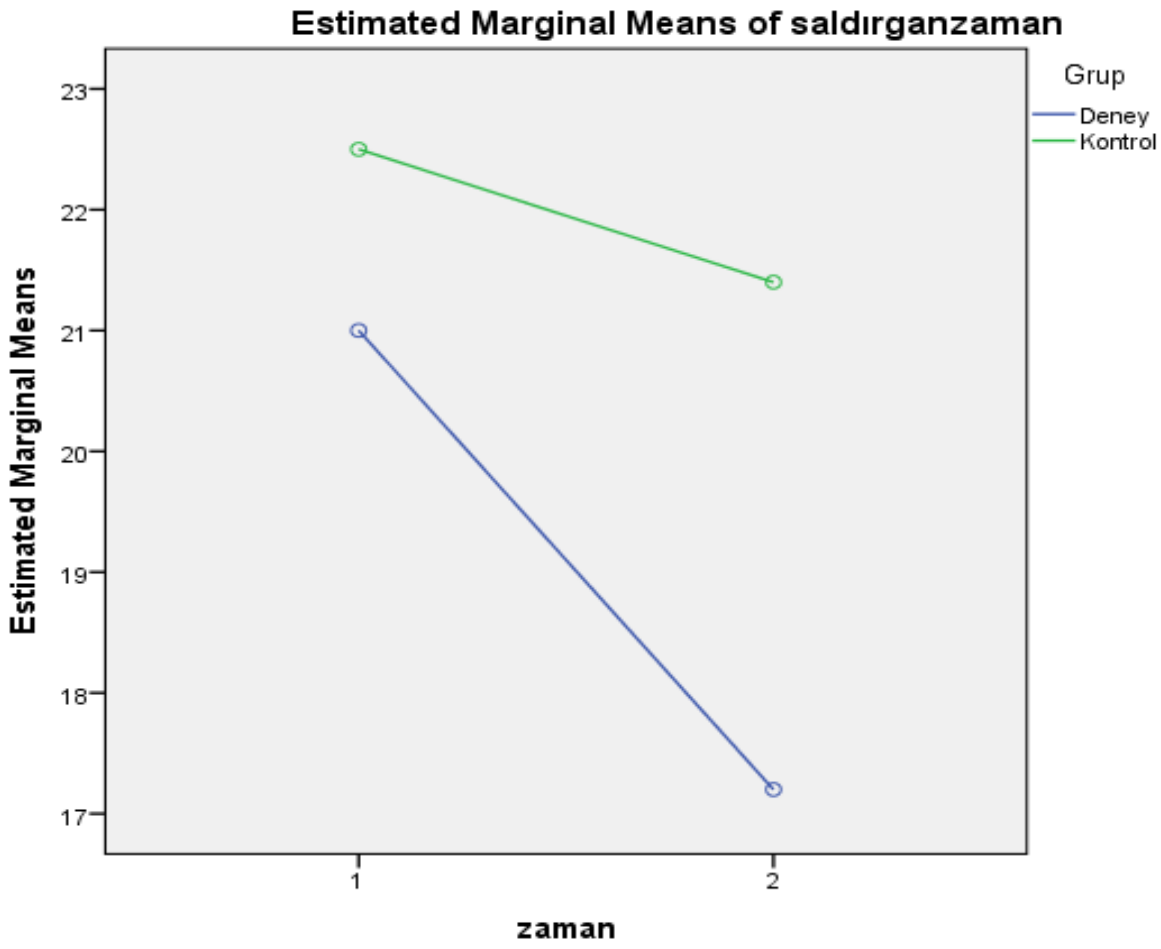
Looking at Bonferroni compatible Post-Hoc test in Table 19, although the difference between the mean score obtained from the experimental group pre-test measurements (X = 19.30) and the post-test mean scores (X = 17.20) is not significant, it is seen that there is a decrease. In other words, it can be said that the experimental process is partially effective in reducing the aggression level of the experimental group. According to the result, although the experimental process is not significant, it has been reduced the level of aggression in the experimental group (p<.05). Similar with the experimental group, although there was a difference between the mean score obtained from the pre-test measurements (X = 23.50) and the post-test mean score (X = 21.40) for the control group, it was found that this difference is not significant. When the mean scores of the experimental and control groups in terms of pre-test (X = 19.30/X = 23.50) and post-test (X = 17.20/ X = 21.40) are compared, it is seen that there is no significant difference between the measurements of the groups (p<.05).

When all these data were evaluated; although the experimental procedure could not show a significant effectiveness in terms of the experimental and control groups, it was observed that there was a decrease in favor of the post-test between the first and the last test on the experimental group.

The multiple comparison findings between the measurements given in Table 6 are also presented in the Figure 2 interaction graph below.

Figure 2

Aggressiveness mean score graph of the experimental and control groups from the pretest, posttest and follow-up measurements



Looking at the Figure 2, it has been observed that there is a certain decrease in the aggression scores of the individuals in the experimental group after the experiment procedure compared to the results beforehand. Although there is an effect of the experimental intervention, control group has also a similar line of experimental group in the graph.

When all these findings were evaluated, it can be said that psycho-educational program has an effect on aggression level of the experimental group. In terms of the control group, there is a decrease in the level of aggression yet it is not same as the experimental group. Consequently, all these results have displayed that cognitive behavioral play therapy-based psycho-educational program has a reduced effect on the aggression level but it is not known whether the effect goes on following the intervention process.

However, there can be a relationship between terms of digital game addiction and aggression as dependent variables of the research. In other words, children who are playing aggression contented digital games may also have some aggressive characteristics. Pearson correlation analysis was used to

determine the relationship between digital game addiction and aggression as dependent variables of the research. Correlation data related to both variables has been presented in Table 7.

Table 7

The Relationship between The Variables of Digital Game Addiction and Aggression Level

Variances	Analyze Type	Game Addiction	Aggressiveness
Game Addiction	Pearson Correlation	1	.538
	Significance Value	-	.014*
Aggressiveness	Pearson Correlation	.538	1
	Significance Value	.014*	-

*= $p < .05$

The relationship between digital game addiction and aggression was examined via Pearson Moments Coefficient. If the Table is observed, it will be seen that there is a value of r = ,538 and $p < .05$ between digital game addiction and aggression variables. According to these results,

It can be said that there is a significant positive relationship between both variables. Pallant (2017) accepts .50 and more as a significantly strong relationship. Therefore, it can be determined that there is a significant and strong positive relationship between digital game addiction and aggression.

Ultimately, Table 7 has shown that these results support the research's hypothesis that there is a relationship between digital game addiction and aggression. In other words, digital game addictive children can have a high level of aggression. Yet, it cannot be said that digital game addiction affects directly the aggression in children.

DISCUSSIONS

Basically, it can be observed that the children who participated in the psycho-education program, which was developed to reduce the level of digital game addiction and aggressiveness in children, showed a significant decrease in the level of digital game addiction compared to those who were not included in the program. When the literature was reviewed, no study was found to reduce the level of digital game addiction with the cognitive-behavioral game therapy-based psycho-education program. In the thesis study by Kaşıkçı (2020), it was also seen that there was a statistically significant difference between the groups that played and did not play violent games in terms of the level of trait anger. However, it is possible to come across studies such as the effect of cognitive-behavioral therapy on the level of digital game addiction or motivational interview techniques on the level of game addiction. To illustrate that, the research findings are consistent with the findings of a research conducted using the psycho-educational model developed based on the motivational interview technique (Özcan, 2018).

One of the other findings is that there is a high level of correlation between the concepts of digital game addiction and aggression. This situation can also be evaluated as the aggression levels of children with high levels of digital addiction may also be high. When the literature is reviewed, supportive evidence is seen. Güvendi et al. (2019) conducted a study with secondary school students and found a positive and significant relationship between aggression and digital game addiction. Furthermore,

Starcevic et al. (2011) also found a non-significant relationship between problematic video game use and psychopathology. Although the psychopathological status of the concept of aggression is discussed, considering its harmful effects on children's mental health, it can be considered a study that supports the current research in terms of the negative consequences of violent digital games.

In light of all these findings and discussion; once fundamental conditions are controlled such as the absence of violence in the content, playing under parental control, setting a time limited considering the developmental stages of children, sleep time, and homework, the digital games can be used to contribute to children's academic and social development. In this context, while Yeşilay (2018) emphasizes that those children under the age of 2 should have a screen-free life; it suggests that students in the first 4 years of primary education can spend a maximum of 45 minutes a day with games and entertainment on the internet and that there should be no more.

According to Elkind (2011) computer games are a part of our environment and they have both good and bad sides. In the case of preschool and school-age children, computers can serve as entertainment as well as education if used judiciously. Moreover, many studies have shown that digital games include stability (Shute et al., 2015; Ventura et al., 2013), spatial skills (Dorval and Pepin, 1986; Feng et al., 2007; Green and Bavelier, 2003), problem-solving skills (Adachi et al., 2003; Willoughby, 2013; Prensky, 2012). Finally, digital games are not merely harmful for children, yet some precautions could be taken by the parents in order to benefit their children optimally by filtering negative effects of digital games.

Limitations

Considering basic scientific criteria, this research bears some limitations. First of all, the study is limited with a sample from a certain area that can be related to easy access to target sample. Another limitation can be counted as the gender of participants that consists of boys because of their selection of aggressive digital games when the researcher surveyed game kinds. In addition to that, the study is limited with 10 cognitive-behavioral play therapy psycho-education sessions. However, the research results may have been affected by the COVID-19 period which people had to spend most of their times at home using technological devices for some reasons related to the work, education and, especially entertainment.

Conclusions

Taking everything into consideration, the study has some crucial conclusions that affect the life of children in several ways. First of all, cognitive-behavioral play therapy-based psycho-education program was found to be effective in reducing digital game addiction and aggression levels of primary school 4th-grade students. In addition to this, during the implementation of the psycho-education program, it was observed that the participants developed a controlled perspective on digital games and aggression. Moreover, after the cognitive-behavioral play therapy-based psycho-education program, parents shared their observations that children showed a relatively more controlled approach to digital games and decreased aggressive impulses. According to these statistical results and findings, it can be accepted that the cognitive-behavioral play-based psycho-education program is effective reducing the level of digital game addiction and aggression in children. To sum up, the psycho-education program can be implemented to different samples in the future in order to increase its scientific and empirical validity.

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Author Contributions

The authors contributed equally for writing the article, conceptualization of the article, data collection, analysis and discussion.

Conflict of Interest

No potential conflict of interest was declared by the author.

Supporting Individuals or Organizations

No grants were received from any public, private or non-profit organizations for this research.

Ethical Approval and Participant Consent

Ethics committee permission for this study was obtained from Sakarya University Ethics Committee with the decision dated 04.11.2020 and numbered 28/17.

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Acknowledgements

No acknowledgements.