Cognitive Behaviour Therapy (CBT) Lowers Online Game Addiction Rates in Adolescents

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A B S T R A C T

High curiosity in adolescents is often shown by playing online games excessively. Continuous and excessive use of online games has many negative impacts, including reduced sleep duration, reduced focus on learning, and increased financial costs incurred. Action that can be given to overcome the negative impact of using online games is the provision of psychotherapy. Psychotherapy that can be given and is believed to be able to reduce the level of online game addiction in adolescents is cognitive behavior therapy (CBT). This study aims to identify the benefits of CBT in reducing online game addiction in adolescents. This type of research is quasi-experimental with a nonequivalent control group design. The research subjects were divided into two groups: the intervention group (23 people) and the control group (23 people). The research was conducted at the Malang National Vocational School in September-November 2022. Data were analyzed using the Wilcoxon and Mann-Whitney tests. This study showed that the treatment group's average value of online game addiction statistically decreased with a p-value of 0.000 (p <0.05). In contrast, in the control group, there was no difference in the p-value of 0.059. A different test for the two groups yielded a p-value of 0.000. From these results, it can be seen that there is a difference in the level of online game addiction between the treatment and control groups. Giving CBT to adolescents is statistically proven to reduce addiction to online games so that adolescents can improve their quality of life by carrying out positive activities that benefit them.

A B S T R A K

Rasa keingintahuan yang tinggi pada remaja sering ditunjukkan dengan bermain game online secara berlebihan. Penggunaan game online yang dilakukan secara terus menerus dan berlebihan memiliki banyak dampak negatif, antara lain berkurangnya durasi tidur, fokus belajar berkurang, dan meningkatnya biaya finansial yang dikeluarkan. Tindakan yang dapat diberikan dalam mengatasi dampak negatif penggunaan game online yaitu pemberian psikoterapi. Psikoterapi yang dapat diberikan dan dipercaya dapat menurunkan tingkat adiksi game online pada remaja yaitu cognitive behavior therapy (CBT). Studi ini bertujuan mengidentifikasikan manfaat pemberian CBT dalam menurunkan tingkat adiksi game online pada remaja. Jenis penelitian ini adalah quasi-experimental dengan rancangan nonequivalent control group design. Subjek penelitian dibagi menjadi dua kelompok yaitu kelompok intervensi (23 orang) dan kelompok kontrol (23 orang). Penelitian dilakukan di SMK Nasional Malang pada bulan September-November tahun 2022. Data dianalisis menggunakan uji Wilcoxon dan Mann-Whitney. Hasil penelitian ini menunjukan nilai rata-rata tingkat adiksi game online pada kelompok perlakuan secara statistik

mengalami penurunan dengan p-value 0,000 (p<0,05), sedangkan pada kelompok kontrol tidak terdapat perbedaan p-value 0.059. Uji beda dua kelompok didapatkan hasil p-value 0.000, dari hasil ini terlihat ada perbedaan tingkat adiksi game online antara kelompok perlakuan dan kontrol. Pemberian CBT pada remaja secara statistik terbukti menurunkan tingkat adiksi game online, sehingga remaja dapat meningkatkan kualitas hidup dengan melakukan aktivitas positif yang bermanfaat bagi remaja

INTRODUCTION

The increasingly advanced development of the internet has an impact on increasing the use of online games, especially among adolescents. (Eskasasnanda, 2017; Kök Eren & Örsal, 2018; Novrialdy et al., 2019; Ozgur & Hasan, 2019; Sussman et al., 2018). Teenagers who use online games in various countries have experienced a significant increase. In 2016, online game users in Australia, reached 76% of the total number of teenagers. This has increased by 39% compared to the previous four years (Brand et al., 2017). Meanwhile in Indonesia, it is known that the number of teenagers addicted to online games is 10.15%; in other words, 1 out of 10 teenagers in Indonesia are addicted to online games (Jap et al., 2013). Teenagers are vulnerable to the adverse effects of using online games, which affect the quality of life of adolescents (Afriwilda & Mulawarman, 2021; El-Sherbini & Abdou, 2020; Karaca et al., 2020; Novrialdy, 2019). Adolescents who cannot control themselves in using online games result in a pathological condition, which is called online game addiction (Dieris-Hirche et al., 2020; Evren et al., 2018; Karaca et al., 2020; Lutfiwati, 2018; Novrialdy et al., 2019; Wong et al., 2020). *Online game addiction* is a significant problem that needs attention in adolescents and has been recognized internationally as a mental health problem (Andrade et al., 2022; Andreassen et al., 2016; González-Bueso, Santamaría, Fernández, Merino, Montero, & Ribas, 2018; González-Bueso, Santamaría, Fernández, Merino, Montero, Jiménez-Murcia, et al., 2018; Griffiths, 2014; Jap et al., 2013; Krossbakken et al., 2018; Montag et al., 2019; Sugaya et al., 2019).

Online game addiction is included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the official diagnosis of ICD-11 as a mental health disorder (Andrade et al., 2022; Darvesh et al., 2020; King et al., 2020; Pontes & Griffiths, 2015; Sussman et al., 2018; Wichstrøm et al., 2019). *Online game addiction* is a behavioral disorder that hurts various aspects of life, such as health, psychological, academic, social, and financial (Novrialdy, 2019; Zeliha, 2019). Increased brain activation creates motivation to play online games and triggers relapse (Zhang et al., 2016). Symptoms of online game addiction include; preoccupation; refusal if the game is stopped; tolerance; failure to control the game; loss of previous hobbies; continuing to play online games even though they already know the impact; lying; using online games as an escape from problems; harm and loss significant relationship (APA, 2013). Someone experiences online game addiction if there are 5 of 9 symptoms (J.S. et al., 2015; Sussman et al., 2018). This measurement can be carried out on someone who uses online games excessively and lasts at least six months (Jap et al., 2013).

The impact of using online games can be positive or negative. Playing online games is positive if used as entertainment, relaxation, and driving away boredom from the exhaustion of various school assignments. Playing online games is negative if teenagers play them excessively, which causes mental health problems (Eskasasnanda, 2017; Kim, 2017; King & Delfabbro, 2019; Nuyens et al., 2019). Adolescents who experience online game addiction often delay completing assignments which affects a decrease in academic achievement (Kurniawan, 2017). Online game addiction experienced by a person in the long term will result in a loss of self-control in terms of cognitive and deviant behavior and withdrawal symptoms similar to drug use disorders (APA, 2013; Karaca et al., 2020; Lindenberg et al., 2022; Schivinski et al., 2018). Thus, addiction is not only used for clients with drug addiction but can also be used in a condition that makes a person physically and psychologically dependent (Novrialdy, 2019).

With its many impacts on adolescents who experience online game addiction, it is essential to overcome this problem (Torres-Rodríguez et al., 2018a). CBT is a tested and effective intervention to help people consider their beliefs, thoughts, feelings, behavior patterns, and actions. CBT can help someone who is addicted to online games to realize and change their behavior and prevent relapse (El-Sherbini & Abdou, 2020; Mestre-Bach et al., 2022; Torres-Rodríguez et al., 2018b). Based on the research results of González-Bueso et al. (2018), CBT is effective in reducing diagnostic criteria and reducing psychotic symptoms in clients who experience addiction to online games. The research results by Park et al. (2016) stated that there was an improvement in brain function in clients who experienced addiction to online games after giving CBT interventions, which could be seen from the neuroimaging results. This study hypothesizes that adolescents have decreased online game addiction after being given CBT.

METHOD

This research is a quasi-experimental study with a nonequivalent control group design, with the application of CBT and Counseling interventions in the treatment and control groups. This research was conducted at the National Vocational School of Malang, East Java Province, from September 26 to November 4, 2022. The subjects in this study were class X adolescents who indicated an addiction to online games based on the screening results. This study's total population experiencing online game addiction was 50 people, with a sample size of 46 people (23 respondents for the intervention group and 23 respondents for the control group).

The sampling technique used is a simple random sampling technique. Data collection began with screening to

determine class X students who experienced online game addiction and asked for approval to become research respondents by signing informed consent. Next, the researcher conducted a study with a pre-test about online game addiction. After the intervention was completed, it ended with a post-test.

Primary data collection in this study using a questionnaire (as a research instrument) which is an instrument to obtain the characteristics of respondents and is used to measure the level of online game addiction in adolescents, namely by using the instrument "The development of Indonesian online game addiction questionnaire" developed by Jap et al. (2013). Bivariate analysis used the Wilcoxon and Mann-Whitney tests. The Wilcoxon test was used to see differences in online game addiction levels before and after the intervention. The Mann-Whitney test was used to see differences in online game addiction levels in each group. This research passed an ethical test by the ethics committee of the faculty of health sciences at Brawijaya University on August 23, 2022, with number: 4045/UN10.F17.10/TU/2022.

RESULTS AND DISCUSSION

The average age of teenagers experiencing online game addiction in the treatment group was 16, as many as 15 people (32.7%). The lowest age is 15, and the highest age is 17 years. The average age of teenagers experiencing online game addiction in the control group was 15 years, namely 11 people (24%). The most significant proportion of the sex experiencing online game addiction was male in the treatment group of 22 people (47.8%) and the control group of 21 people (45.7%). The games used in both groups mainly used mobile legend online games, namely 12 people each (26.1%). The history of using online games in the two groups was the same for more than one year, namely 19 people (41.3%) in each group. The use of online games was carried out for more than 3 hours a day. Namely, in the treatment group, there were 16 people (34.8%), and in the control group, 17 people (37%). Playing online games used by teenagers in this study, the majority in groups, namely in the treatment group, were as many as 18 people (39.1%), and in the control group, as many as 14 people or 30.4% (Table 1).

Table 1.
Distribution of Respondents Based on Characteristics (Age, Gender, Game Name, History, Time of Day, and Type of Play)

Characteristics	Treatment (N=23)	%	Control (N=23)	%	Total (N=46)	% (100%)
Age						
15 years	6	13	11	24	17	37
16 years	15	32.7	10	21.7	25	54.3
17 years	2	4.3	2	4.3	4	8.7
Gender						
Man	22	47.8	21	45.7	43	93.5
Woman	1	2.2	2	4.3	3	6.5
Game						
Mobile legend	12	26.1	12	26.1	24	52.2
FF	7	15.2	6	13	13	28.2
PUBG	4	8.7	5	10.9	9	19.6
History						
6 – 12 months	4	8.7	4	8,7	8	17.4
> 1 year	19	41.3	19	41.3	38	82.6
Time of day						
2-3 hours	7	15.2	6	13	13	28.2
> 3 hours	16	34.8	17	37	33	71.8
Type						
Alone	5	10.9	9	19.6	14	30.5
Group	18	39.1	14	30.4	32	69.5

Changes in Online Game Addiction Levels in Adolescents Before and After CBT Intervention and Counseling in the Intervention and Control Groups.

The Wilcoxon test was carried out to decrease the level of online game addiction in adolescents before and after the intervention in the treatment and control groups. The average level of online game addiction in the treatment group before the CBT intervention was 20.96, meaning that most teenagers were at a mild-moderate level, with a standard deviation of 1.988. After being given the CBT intervention, the measurement results showed that the average online game addiction level was 8.91, meaning that it had decreased to no addiction, with a standard deviation of 2.485. The average decrease in the level of online game addiction in adolescents before and after the intervention in the treatment group was 12.05. The statistical test results obtained a p-value <0.05, which means that there was a significant decrease in the level of online game addiction in

adolescents before and after the CBT intervention, intervention in the treatment group (Table 2).

The average level of online game addiction among adolescents in the control group before being given the counseling intervention was 17.09, with a standard deviation of 2.745, which means that the majority were at a mild-moderate level of online game addiction. The measurement results after counseling interventions showed an average level of online game addiction in adolescents was 16.87 with a standard deviation of 2.801, meaning that adolescents remained at a mild-moderate addiction level. The average decrease in the level of online game addiction in adolescents before and after the intervention in the control group was 0.22. The statistical test results obtained a p-value > 0.05. It can be concluded that there was no significant decrease in the level of online game addiction in adolescents before and after the counseling intervention in the control group (Table 2).

Table 2.
Results of Analysis of the Effect of Giving CBT to the Treatment Group and Counseling to the Control Group on the Level of Online Game Addiction in Adolescents

Variable	N	Mean	SD	p- value
Online game addiction rate in the treatment group:				
a. Before	23	20.96	1.988	0.000
b. After	23	8.91	2.485	
Online game addiction rate in the control group:				
a. Before	23	17.09	2.745	0.059
b. After	23	16.87	2.801	

Differences in the Levels of Online Game Addiction in Adolescents Who Received CBT Actions in the Treatment Group and Those Who Received Counseling Actions in the Control Group

The Mann-Whitney test was carried out to see the decrease in the level of online game addiction before and after the intervention in the two groups. The average level of online game addiction between the treatment group and the control group differed significantly by 22.7 after giving CBT to the treatment group and after counseling the control group. Statistical tests showed that the treatment group's average level of online game addiction was lower than in the control group after being given the intervention. The statistical test results obtained a p-value <0.05 (0.000), meaning that there was a significant difference between the administration of CBT and counseling in the treatment group and the control group. The level of online game addiction was higher in the control group than in the treatment group. The most effective intervention in reducing online game addiction in adolescents is the administration of CBT (Table 3).

This study has identified the level of online game addiction in adolescents who received CBT and counseling. The level of online game addiction in the treatment group was lower or had no online game addiction compared to the control group, with an average score that was still high after counseling was given. According to Luthfia et al. (2019), Adolescents are the most active and potential age to use online games. Adolescents who experience online game addiction are more concerned with playing online games than other activities (Seok et al., 2018). This impacts health problems, psychological disorders, academic disturbances, social disturbances, and increased expenses (Novrialdy, 2019).

Table 3.
Results of Analysis of Differences in CBT Intervention in the Treatment Group and Counseling Intervention in the Control Group in Reducing Online Game Addiction Rates in Adolescents

Group	Variable	N	Mean Rank	Z	p- value
Treatment	CBT Intervention	23	12.15	-5.778	0.000
Control	Counseling Intervention	23	34.85		

The excessive use of online games shows the condition of mental, social, and emotional instability in adolescents (Bhagat et al., 2019; Ferreira et al., 2021). In this study, it was found that male adolescents experienced more online game addiction than women; the most widely used online game was a mobile legend. This research states that online mobile legend games have become more commonly used by male adolescents than female adolescents (Arthy, 2019 ; Hasan *et al.*, 2021). Teenagers say that the mobile legend online game is exciting because it can excite the players to compete to win the game (Rani et al., 2019).

The attraction to always playing online games excessively for a long and prolonged period hurts adolescents futures (Surbakti, 2017). In line with the results of Winarti et al. (2021), the consequences of using online games are deviant behavior in adolescents, including thinking about dirty words, unstable emotions, being lazy to do other activities and exposure of teenagers to pornography which triggers free sex behavior. Prolonged use of online games negatively impacts psychosocial and social aspects, causing problems in adolescent education, adolescent sleep duration, destructive emotions, indifference, quarrelsomeness, anxiety, and difficulty getting along. This will put adolescents at risk of mental health problems (Agustarika & Adam, 2020; Fitri et al., 2018 ; Twenge & Campbell, 2018).

Cognitive Behavior Therapy (CBT) is a psychotherapy that can be used to reduce the level of online game addiction in adolescents. CBT is used to change negative thoughts into positive thoughts. Negative thoughts in adolescents, in this case, mean immature thinking in understanding the destructive effects of excessive use of online games. Based on the research results of Karaca et al. (2020), said that it is necessary to take preventive measures against online game addiction, especially at school age. Suppose online game addiction experienced by school age is not addressed immediately. In that case, it can result in students being out of control due to their inability to limit the time they play online games. The study by Iik et al. (2021) said that if someone does not experience online game addiction at first, if they continue to play online games, it will cause online game addiction.

CBT measures help overcome online game addiction. CBT actions can calm the mind so that a person can think positively, change negative behavior and physically improve (Fitri et al., 2018). This is in line with the results of Lindenberg et al. (2022) stated that CBT is effective in reducing symptoms of online game addiction in a person. Providing CBT therapy reduces the frequency and intensity of

playing online games and decreases, and adolescents do more positive activities such as interacting with family and peers and completing school assignments, and adolescents can make the best decisions for themselves (Narullita & Yuniati, 2021; Torres-Rodríguez *et al.*, 2018). CBT effectively reduces anxiety and the time spent playing online games experienced by online game addiction sufferers. For this reason, CBT can be used as a long-term intervention in reducing online game addiction (Stevens et al., 2019).

The CBT stages in this study consisted of 4 sessions, including session 1: identifying bad experiences experienced by adolescents, identifying negative automatic thoughts and behaviours, exploring positive aspects of adolescents and using these positive aspects to counter thoughts and behaviours negative auto. In session 2: identifying automatic negative thoughts and behaviours that are still there and dealing with them. In session 3: identify internal and external support systems that adolescents have. In session 4, evaluate the benefits adolescents get against automatic negative thoughts and behaviours. The application of CBT in this study is very beneficial for adolescents addicted to online games. For adolescents who experience mild-moderate levels of addiction after being given CBT, the results show a decrease in the level of addiction to no addiction. Changes in adolescent behaviour from initially maladaptive to adaptive after being given CBT. Teenagers have been able to control themselves by reducing the time playing online games with other activities that are more beneficial for teenagers. In line with the statement that CBT is a promising intervention to overcome the problem of online game addiction because it can improve the quality of life of adolescents (El-Sherbini & Abdou, 2020).

Counselling given to the control group in this study consisted of 4 stages, including stage 1: orientation and exploration in building a trusting relationship. Stage 2 is the transitional stage, namely the process of understanding the characteristics and dynamics of adolescents. Stage 3: carry out a process of exploring in-depth problems and practical actions in dealing with adolescent problems. Stage 4: the final stage in seeing changes in adolescent behaviour. After providing counselling to adolescents, most experienced mild-moderate levels of addiction. It was found that very few experienced positive behaviour changes. Teenagers still cannot reduce the time they play online games, put aside other essential activities, often experience sleep deprivation, forget to do school assignments, and are late for school. This is in line with the results of Mustamiin (2019), which states that there is no effect of providing counselling to adolescents who are addicted to online games.

The action was given to the treatment group by giving CBT, and the action was given to the control group by counselling action. It was found that there was a significant difference between giving CBT action and Counseling action in reducing the level of online game addiction in adolescents through the Mann-Whitney test with a significance value (p-value) = 0.000 < 0.05. From these results, it is known that CBT is effective in reducing the level of online game addiction in adolescents. Adolescents who receive CBT therapy can control themselves by using online games for less than 2 hours per day and can control themselves to divert online games with other activities that are more beneficial for adolescents. In the control group that was given Counseling, there was no change in adolescent behaviour in online games and a very slight decrease in the score, namely 0.22. Thus, CBT is very effective and helpful in reducing the level of online game addiction in adolescents by changing their mindset of adolescents. Become a better mindset so that adolescent behaviour also changes into positive behaviour.

CONCLUSIONS AND SUGGESTIONS

CBT is perfect and helpful in reducing the level of online game addiction for teenagers. The difference before and after, CBT intervention in the treatment group was 12.05. The difference before and after the counseling intervention in the control group was 0.22. There is a significant difference in the level of online game addiction among adolescents between the treatment group with CBT and the control group with Counseling. Research on the effectiveness of CBT for families with teenagers needs to be done to prevent online game addiction.

ETHICAL CONSIDERATIONS

This study was approved by the Health Research Ethics Committee, Faculty of Health Sciences, Brawijaya University, with number 4045/UN10.F17.10/TU/2022.

Conflict of Interest Statement

The author states that there is no potential conflict of interest related to the writing and publication of this research article.

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