

## THE USE OF COGNITIVE BEHAVIOUR THERAPY AS A TREATMENT OF INTERNET ADDICTION DISORDER IN ADOLESCENTS: LITERATURE REVIEW

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### ABSTRACT

**Background:** Internet Addiction Disorder (IAD) is a condition of internet dependence that can hinder adolescent development, as many as 73% of teenagers experience gadget addiction and as much as 75% experience internet addiction. IAD can cause significant losses to teenagers, such as they will not control themselves, feeling restless, anxious, depressed and can impair their daily activities. This can harm their psych and psychology. **Purpose:** This article aims to analyze the effectiveness of Cognitive Behavior Therapy (CBT) on IAD treatment in adolescents. **Method:** The method used in writing this article was a literature review. Reports were obtained through search sites such as Proquest, Science Direct, and PubMed with a range of publication years 2015-2021. Nine main journals were used as references by the authors. **Results:** From the nine major journals, it was found that CBT was effective in treating and reducing the signs and symptoms of internet addiction in adolescents. After being given CBT intervention for 1-12 meetings, there was an improvement in neurotransmitters and imaging results in the brain. Furthermore, giving CBT can reduce the duration of gadget use, anxiety, depression, and impulsive behavior in adolescents with IAD. **Conclusion:** CBT can be used to treat and prevent IAD in adolescents by changing maladaptive behavior into adaptive ones. Individuals are taught to understand and monitor their thoughts to identify which triggers feelings and actions of internet addiction. **Keywords:** Cognitive Behaviour Therapy, Internet Addicted Disorder, Adolescent

## INTRODUCTION

Nowadays, technological developments have a big influence. One of the examples is the massive use of smartphones. The use of smartphones is easily accessible to the public, including adolescents. Through their smartphones, people can easily access various information media with their internet connection. In addition to the many benefits they attained from the internet, on the other hand, these activities harm adolescents' health and development (Karlina, 2020). If this is allowed to continue, they will experience Internet Addiction Disorder (IAD). The clinical manifestations that can be shared by adolescents when experiencing IAD are feeling preoccupied with the internet, needing additional time when playing the internet, unable to control themselves, reducing or stopping internet use, feeling restless, nervous, anxious, moody, depressed when trying to minimize internet duration, and always use the internet as a way to solve problems (Mawarani, 2019; Mihajlov & Vejmelka, 2017). This can be an indication that the internet has become a necessity and causes addiction effects in people which harm their psyche and psychology (Lopez-Fernandez & Kuss, 2019).

Based on a meta-analysis, the highest internet addiction occurred in the Middle East (10.9%), then North America (8.0%) and Asia (7.1%). In Asian adolescents, especially in China, the prevalence of internet addiction is 2.2-9.6%, Japan is 3.1-6.2%, Philippines is 4.9-21.1%, and Hong Kong is 3.0-16.4% (Lau *et al.*, 2017). Based on a survey by *Behavioral Addiction Experts* in 2020, a total of 2,933 teenagers experienced an increase in online duration from 7.27 hours to 11.6 hours per day. That's an increase of 59.7 percent. In Indonesia itself, according to the Central Statistics Agency (CSA) in collaboration with the Association of Indonesian Internet Service Providers (AIISP) recorded the growth rate of internet users reached 71.19 million people until the end of 2013. Then, it increased in 2014 to 83.7 million people (Diarti, Sutriningsih, Rahyu, 2016). Gunawan *et al.* (2021) shows measurements of 2014 respondents in Indonesia for internet/social media addiction conditions occurring in the category of adolescents as much as 73% (467 respondents) and gadget addiction as much as

75% addicted (382 respondents). This shows that adolescents are the group with the most addiction (Gunawan *et al.*, 2021). Maulida & Sari (2017) mentioned that in Indonesia, internet addiction in adolescents is 42.4% of all teenagers who use the internet, 70% access the internet for negative things such as cybercrime, cyberporn, and online games for more than 3 hours per day (Maulida & Sari, 2017).

Efforts to reduce internet use were self-control training in adolescents, but this is less effective due to adolescent behavior that often changes, and adolescents' psychological conditions are uncertain, so they have not been able to control themselves (Ramadhani *et al.*, 2019) fully. Therefore, it is necessary to replace efforts with other activities, for example, the provision of Cognitive Behavior Therapy (CBT). CBT is a therapeutic approach centered on the thought process and is related to emotions, behavior, and psychology (Aini, 2019).

Budi Rahayu & Widiana's research (2019) showed that CBT was effective in helping to deal with several individual psychological problems, namely in the cognitive aspect, emotional aspect, and can control feelings of anger (Budi Rahayu *et al.*, 2019). Thus, CBT seeks to integrate therapeutic techniques that focus on helping individuals make changes in real behavior and fundamental thoughts, beliefs, and attitudes (Sulaiman, 2016).

Kim *et al.* (2018), in their research on the practice of using CBT-IA, showed that more than 95% of clients were able to manage symptoms of IAD at the end of twelve weeks of CBT administration, and 78% experienced recovery after six months of treatment. J. Han *et al.* (2020) stated that giving CBT effectively improved psychological symptoms and social interaction with an improvement value of 66.3%. In addition, the intervention group experienced improvements in terms of internet usage time, anxiety, impulsivity, and social interaction (J. Han *et al.*, 2020).

Based on the above phenomena, the authors are interested in conducting a systematic literature review that aims to analyze the overall effectiveness of CBT in reducing the level of internet dependence in adolescents. This information is needed to

decide on the promotion of CBT intervention as main therapy in reducing symptoms of internet dependence in adolescents in Indonesia.

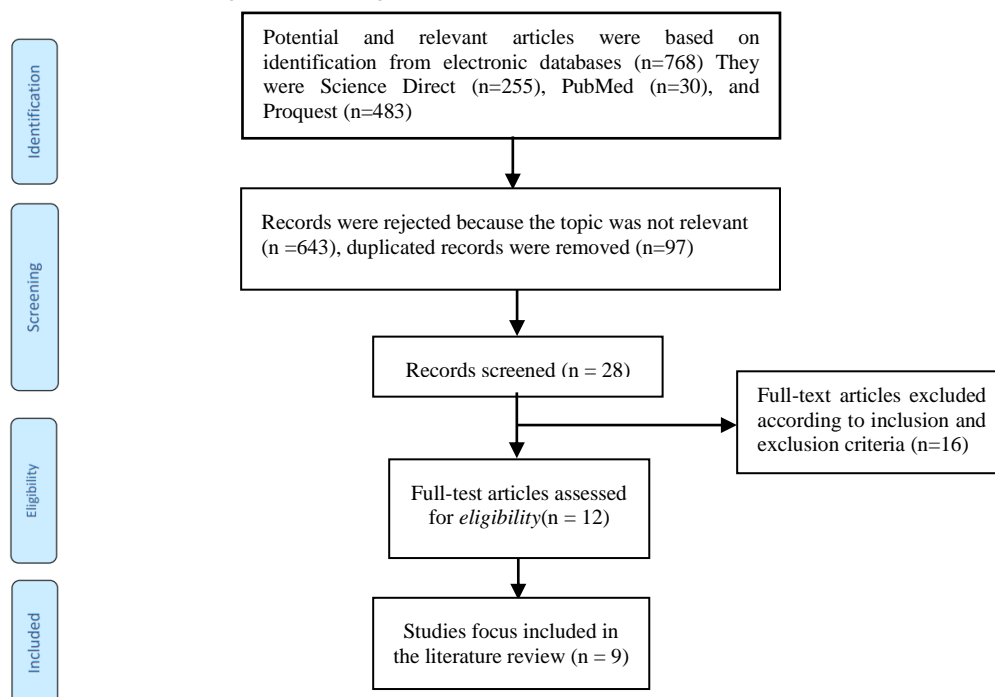
## METHOD

The method used in writing this was a literature review. The authors used critical and systematic thinking methods based on the study results of various research articles by analyzing using logic and argument methods. The literature collected and following the criteria will be examined and synthesized by categorizing it into problem analysis and potential problem-solving. The guidelines in writing this literature review used the PRISMA (Preferred Reporting Items Systematic Reviews and Meta-analyses) method. The literature used was articles obtained from electronic media obtained from Proquest,

Science Direct, andPubMed through the keywords "Cognitive Behavior Therapy," "Internet Addicted Disorder," or "Internet Addicted", and "Adolescent".

In selecting articles, the author used inclusion criteria, including articles in Indonesian and English, the range of publication years from 2015 to 2021, open access journals, and pre/quasi/or experimental studies. The author did not limit the research locations in the search journal. After going through several stages of the article selection process from identification, screening, eligibility, and inclusion, nine journals were obtained as the main reference in writing this literature review. Below was an outline of the article search results :

Chart 1. Article Selection Using PRISMA Diagram



## RESULT

This literature review contains nine journals as a framework for analysis and synthesis in discussing the effectiveness of CBT in reducing and treating the incidence of Internet Addicted Disorder (IAD) in adolescents. The research locations in the nine prominent journals used in this article were in several countries with details of 4 journals in Indonesia, four research journals in

Korea, and one journal situated in China with a range of publication years from 2015 to 2021. The research methods used in the journal also studied varied with the most experimental study with pretest and post-test designs. The CBT intervention applied in the research procedure also had various times ranging from 1 meeting to 14 meetings with the same result that CBT effectively reduced internet addiction. More details can be seen in Table 1 below.

Table 1. Literature Review Matrix

Author & Year	Country	Title	Method	Intervention	Results & Discussion
Zees et al., 2018	Gorontalo, Indonesia	Effectiveness of Cognitive Behavior Therapy (CBT) Against Gadget Addiction in Adolescents at Gorontalo Health Polytechnic	Pre Experimental with one group pretest-posttest approach.	Researchers provide CBT intervention for one time, then undertaken post-test measurements	The results of this study indicate that CBT can reduce the level of gadget dependence on respondents (p-value = 0.000)
Hamu et al., 2020	Surabaya, Indonesia	The Effect of Cognitive Commitment of Behavioral Therapy on Internet Addiction among Adolescents in Kupang City	A quasi-experimental study with pretest and post-test design approach	The intervention consisted of 5 sessions, and each session was once in five days. Meanwhile, each group consists of 10 people with a duration of 45-60 minutes.	This study shows that CBT effectively reduces the level of internet dependence on respondents with a result of p = 0.000. Furthermore, respondents who were given CBT tend to be able to control their emotions and impulsivity.
Seo, H., et al., 2020	Korea	Changes of Neurotransmitters in Youth with Internet and Smartphone Addiction: A Comparison with Healthy Controls and Changes after Cognitive Behavioral Therapy	Experimental studies with pretest and post-test design	Researchers used g-aminobutyric acid and Glx levels in the anterior cingulate cortex to determine the effectiveness of CBT. Moreover, one to two days after completing therapy for nine weeks, respondents underwent MR imaging scans	After being given CBT, children addicted to the internet and smartphones experienced a significant decrease in brain parenchymal- and gray matter volume-adjusted g-aminobutyric acid-to-creatine scores with statistical test results (P=0.034 and 0.26). Both neurotransmitters are closely related to people who experience gadget addiction.
Bong, S. H., et al., 2021	Daegu, South of Korea	Effects of Cognitive-Behavioral Therapy Based Music Therapy in Korean Adolescents with Smartphone and Internet Addiction	Experimental studies with pretest and post-test design	The combination therapy of CBT and music therapy was carried out for eight weeks with a total of 8 therapy sessions. Each session lasts for 75 minutes	The results of the questionnaire measurement after being given CBT intervention and music therapy decreased significantly with p<0.001. Combining music therapy and CBT improves the symptoms of internet dependence on respondents, such as reducing impulsivity, depression and anxiety.
Kim, S., et al., 2018	Seoul, Korea	The Effects of Group Cognitive Behavioral Therapy on the Improvement of Depression and Anxiety in Adolescents with Problematic Internet Use	Experimental studies with pretest and post-test design	Each respondent is given eight sessions of CBT therapy with details of 2 meetings every week	The results of this study indicate that giving CBT sessions for one month can reduce depression and anxiety scores in adolescents with an internet-addicted disorder, with statistical results showing p<0.05
Han et al., 2018	Shanghai, China	Resting-State Activity of Prefrontal-Striatal Circuits in Internet Gaming Disorder: Changes with Cognitive Behavior Therapy and Predictors of Treatment Response	Experimental study research design with rsfMRI	All subjects were resting-state fMRI at baseline with a 3.0-T MR imaging system (GE Signa HDxt3T, USA) with a standard head coil.	The results of this study follow what the researchers expected. Respondents with an age range of 7-19 years show a significant increase in CIAS, SAS, SDS, and BIS-II scores with statistical test results p = 0.001, 0.02, 0.04, and 0.001) and longer playtime with friends.
Sari, S. F., et al., 2020	Surakarta, Indonesia	Cognitive Behavior Therapy Reduce Online Game Addiction In High School Students	Quasi-experiment with pretest and post-test approaches	The CBT therapy given was CBT with four sessions/group, and CBT was given for 45 minutes each session.	The results showed that the average value of online game addiction before the intervention was 57.17, and the average value of online game addiction after the intervention was 43.23. This study concluded that Cognitive Behavior Therapy significantly reduces online game addiction with a p-value of 0,
J. Han et al., 2018	Soul, South Korea	Efficacy of Cognitive Behavioral Therapy for Internet Gaming Disorder	An experimental study with pretest and post-test design	The CBT program is undertaken for 14 meetings; each meeting is 90 minutes long, one therapist handles 4 to 5 patients according to 1-2 times a week	This study indicated that the group of children with IAD experienced an improvement in psychological symptoms and social interaction with an improvement value of 66.3%. In addition, the intervention group experienced improvements in terms of internet usage time, anxiety, impulsivity, and social interaction.
Islamiah et al., 2015	Bogor, Indonesia	Cognitive Behavior Therapy to Increase Self-Esteem in School-Age Children	single-subject research design	The intervention was carried out in 10 meetings. The duration of each session ranges from 90-120 minutes.	The results of the case study research on participants showed that the CBT intervention effectively improved low self-esteem in children. This can be seen from the increase in self-esteem scores as much as 14 as measured using The Rosenberg self-esteem Scale,

## DISCUSSION

### Internet addiction disorder (IAD)

*Internet addiction disorder* (IAD) has many risk factors and some negative consequences that can impact the lives of teenagers. Teenagers mainly use the internet excessively because they feel alone, fear of social interactions, compulsive behavior, and the habit of solving problems with the internet (Kim *et al.*, 2018). Helena Hamu *et al.* (2020) explained that the adolescent brain has increased dopamine levels in the prefrontal cortex but decreased in the nucleus accumbens/pleasure center. Reducing dopamine levels in teenagers could make them more exciting and make them feel euphoric about something. As a result, they will devote everything by looking for something addictive, such as playing online games and surfing the internet; Adolescent nerves are still in the formation stage. Therefore, it is easier for adolescents to make such behavior become an addiction (Helena Hamu *et al.*, 2020). Seo *et al.* (2020) stated that the neurotransmitters could be reversed and normalized with Internet and smartphone addiction and comorbidities improvement. Their study showed that GABA levels were higher in the ACC in young subjects with Internet and smartphone addictions and decreased after nine weeks of CBT. The bp-GABA and GM-GABA correlated with depression and anxiety scores and Internet and smartphone addiction scores (Schür *et al.*, 2016). The bp-Glx and gm-Glx negatively correlated with insomnia severity and sleep quality. So that CBT also can improve the quality of life and overcome insomnia in people with internet addiction (Seo *et al.*, 2020).

### Cognitive Behaviour Therapy (CBT)

Cognitive Behavior Therapy is one approach used for behavior modification (Islamiah, *et al.*, 2015). The modification in question is directing the goals used to obtain the desired new behavior (Şenormanci *et al.*, 2010; Sa'adah and Rahman, 2015). The basic assumption of this therapy is that most problems of behavior, cognition and emotion are the result of learning and can be changed by new learning, this therapy also believes that human thought patterns are formed through a

series of stimulus-cognition-response processes (Zhang, Zhang and Xu, 2019).

The techniques commonly used by experts in performing CBT are (Islamiah, *et al.*, 2015; Maulidiyah, 2015; Han *et al.*, 2018):

- 1) Bibliotherapy, accepting the internal emotional state with something interesting
- 2) Repeating the use of various self-statements in the role of real situations
- 3) Measuring feelings, for example measuring feelings of anxiety experienced at this time on a scale of 0-100 with a predetermined questionnaire
- 4) Stopping thoughts: Counselees learn to stop negative thoughts and turn them into positive thoughts
- 5) Systematic desensitization: Replacing fear and anxiety responses with relaxation responses by posing problems repeatedly and sequentially from the heaviest to the mildest fear responses to reduce the counselee's emotional intensity.
- 6) Social skills training: Train counselees to be able to adapt themselves to their social environment.
- 7) Assertiveness skill training in order to act decisively.
- 8) House assignment. Practicing new behavior and cognitive strategies between counseling sessions.
- 9) In vivo exposure: Overcome the situation that causes the problem by entering into the situation.
- 10) Convert conditioning,

hidden conditioning efforts by emphasizing the psychological processes that occur within the individual to control behavior based on imagination and perception.

Han *et al.* (2018) found that adolescents addicted to online games have abnormal function of some prefrontal-striatal regions and that CBT could attenuate the functional abnormalities in the orbitofrontal cortex (OFC) and the putamen and increase the interactions between them. In addition, CBT is also effective in reducing the signs and symptoms of game addiction (X. Han *et al.*, 2018). Han *et al.* (2018) observed that the amplitude of low-frequency (ALFF) values in

the left superior OFC and the left putamen increased OFC-putamen connectivity after the CBT, which are findings that are consistent with previous observations that suggested that the OFC-striatal circuit may be a potential therapeutic target across addictive disorder (X. Han *et al.*, 2018)

There are three primary IA prevention interventions: cognitive reconstruction, skills development, and lifestyle reorganization (Young, 2013). CBT was one of the approaches used for behavior modification (Islamiah *et al.*, 2015). The improvement in question directs the goals to obtain the desired new behavior (Şenormanci *et al.*, 2010; Sa'adah and Rahman, 2015). According to Zees *et al.* (2020), humans can modify changes in behavior because of their ability to interact with themselves, which allows them to examine the stages of action and assess the advantages and disadvantages of using a smartphone (Zees *et al.*, 2020).

The central element of CBT in increasing motivation and behavior change of online game addicts is to gradually facilitate people with internet game disorder (IGD) to realize the problem of addiction and its negative impacts and facilitate two-way discussions to overcome the problem (Sari *et al.*, 2020).

### Effectiveness Cognitive Behaviour Therapy (CBT)

Research by J. Han *et al.* (2020) stated that CBT intervention in-game addiction sufferers were more effective than other types of supportive therapy. Respondents who were given CBT experienced a reduction in the intensity of playing games, impulsivity, and social avoidance. In addition, respondents also experienced improvements in terms of psychological factors such as a reduction in scores of stress, anxiety, and depression as well as in terms of their environment such as family cohesion, social interaction, and self-confidence compared to the provision of supportive therapy (J. Han *et al.*, 2020).

Zhang (2019) developed a unique treatment, CBT-IA, whose role is to help people find out what causes them to experience IA and find solutions according to the problems and difficulties they faced practically. Furthermore, this therapy is

effective in reducing the symptoms of IA. Therefore, CBT has been considered an appropriate tool for IA because this therapy can show significant results in symptom reduction. Furthermore, Zhang (2019) found that CBT can improve time management skills, emotional, cognitive, and behavioral symptoms. Moreover, Zees *et al.* (2020) research showed that CBT could improve mental aspects distorted to become more rational so that the behavior of playing games is reduced (Zees *et al.*, 2020).

Kim *et al.* (2018), in their study of the practice of using CBT-IA, showed that more than 95% of clients were able to manage symptoms of internet addiction at the end of twelve weeks, and 78% experienced recovery after six months of treatment. Furthermore, CBT motivated respondents to think about alternative activities in using the internet and improving individual self-regulatory abilities. In addition, Kim *et al.* (2018) also demonstrated that CBT can also reduce depression in respondents because this therapy is used to restore the emotional state so that respondents who have compulsive behavior can be modified by doing new healthy activities to prevent a recurrence (Kim *et al.*, 2018).

Young (2013) suggested that CBT effectively improved Internet addiction symptoms: Internet preoccupation, inability to control Internet use. In addition, clients are also more interested in school and fostering social relationships. For six months, 70% of respondents maintained symptom management and continuous recovery. The CBT mechanism in overcoming the problem of gadget addiction in adolescents is through an educational method with a counseling approach through cognitive restructuring, more emphasis on the client to understand his condition, then accept that negative thought, then the client tries to change the mind, behavior, according to the values adopted (Helena Hamu *et al.*, 2020).

Bong *et al.* (2021) investigated the effectiveness of CBT for eight weeks combined with music therapy. They found that this therapy was more effective in reducing the signs and symptoms of internet addiction, lowering anxiety, ADHD, impulsiveness, and depression in children who experience IAD (Bong *et al.*, 2021). In addition, CBT can

increase motivation to stop playing online games, control repetitive behavior, and strengthen decision-making to engage in diversionary activities (Dong *et al.*, 2018; Sari *et al.*, 2020).

Islamiah *et al.* (2015) also showed that CBT could also increase self-esteem in children. When undergoing CBT intervention in children, parental involvement is needed. The role of parents has a significant influence when children experience the intervention and maintenance phase. CBT methods that can apply to children include games, exercises, reflecting on a story, watching shows, thoughts bubbles, etc (Islamiah *et al.*, 2015).

## CONCLUSION

From the nine main journals analyzed by the authors, it was concluded that Cognitive Behaviour Therapy (CBT) effectively alleviated the signs and symptoms of IAD in adolescents. Individuals are taught to understand and monitor their thoughts to identify and modify their behavior, which triggers internet addiction feelings and actions. Individuals with IAD that were given CBT experience improved imaging results in the brain, family cohesion, social interaction, self-esteem, and neurotransmitter. Furthermore, giving CBT can reduce the duration of gadget use, anxiety, depression, and impulsive behavior in adolescents with IAD.

## SUGGESTION

The application of CBT in Indonesia needs to be studied and researched further by multidisciplinary health workers to provide new alternatives in preventing and managing IAD, which often occurs in adolescents in Indonesia. So that CBT can be developed additionally based on standard procedures that have been made and as evidence-based that CBT is an effective alternative therapy in the treatment of IAD.

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## CONFLICT OF INTEREST

Author have no conflict of interest.

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## AUTHOR CONTRIBUTION

Author Lutfian as collecting references, writing background of study, writing methodology and result, leading the discussion in writing the result and discussion. Author Ayunda Puteri Rizanti as translating the manuscript, Inputting all of the references to Mendley, and writing discussion. Author Ilany Nandia Chandra as writing abstract, conclusion, and recommendation, revised the manuscript, and checking the turnitin.

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