

## The Addictive Game toward Children with ADHD

Luqyana Dhiya Amira<sup>1</sup>, Abdul Huda<sup>2</sup>, Rizqi Fajar Pradipta<sup>3</sup>

<sup>1</sup>SLB Autis Laboratorium UM, Malang, Indonesia

<sup>2,3</sup>Universitas Negeri Malang, Malang, Indonesia

E-mail: rizqi.fajar.fip@um.ac.id

**Abstract:** Games are a technology that is constantly evolving and very attractive to many people. High game usage will continue because of the increased quality of technology, especially smartphones. Addictive game is the impact of the use of games that are not controlled. Everyone has the possibility to addictive games, including children with special needs. For example, ADHD is very attached to his favorite object. This study aims to determine the addictive characteristics of games on ADHD, the impacts and treatment by people around the child. This study uses a qualitative research design with a single case study type. Qualitative with this type of single case study conducted because of the uniqueness of the things to be studied and will be examined more deeply. The research subjects are children with ADHD, seven years old, who are addicted to games. Data collection was carried out through three techniques, interviews, observation, and documentation. The results showed that children with ADHD are more vulnerable to addictive games and have a considerable risk than children in general. It can be seen in the characteristics and addictive impacts of games on ADHD.

**Keywords:** Addictive, Game, Smartphone, ADHD, Behavior

### INTRODUCTION

Nowadays, children prefer to play smartphone games. Children will play a game secretly with their parents if it is forbidden. According to Henry (2010), games are inseparable from children's daily lives. The number of gamers is increasing because the game triggers adrenaline and gives a sensation when played. Children will be increasingly challenged to face the difficulties of the following levels. The number of addiction game users will continue to grow, accompanied by an increase in the quality of technology, especially smartphones, and the expansion of the internet network. It is easier to download games and use games that are many downloaded by users. A smartphone or cellular phone is a communication device that can be carried anywhere and used because of its small size and does not need to be connected to a wired network when accessing the internet. The smartphone has a function as a personal digital assistant. Electronic devices are small and can be carried everywhere (Wikipedia, 2019). Games inside a smartphone also make it easier for users to use games freely wherever and whenever, but the simplicity needs to be questioned. If the game can be accessed everywhere and used at any time, it will increase the potential number of users who have an addiction to the game.

Addictive is something that is addictive and causes dependence on the users (KBBI). The game can be opium and make people always want to play it because it triggers adrenaline. The birth of new

games and sophisticated smartphones that support game development will increase the number of people addicted to the game. The game has a good impact if the use is within normal limits and, according to the ESRB reference, a rating system for game software (Henry, 2010). However, excessive use of the game has a harmful impact. According to Kuss and Griffiths in Beranuy et al. (2013), addiction is a form of attitude that feels bound to an object, affecting cognitive, social emotions, behavior, and real life. Some of the effects caused by the addictive game are the emergence of psychiatric problems and stress. For example, on April 20, 1999, high school students in America named Eric Harris and Dylan Klebold killed 13 people and committed suicide. These students are fans of the 3D video game *Wolfenstein Doom* (Henry, 2010). Addictive cases to the game also appear in children aged five years in Indonesia. Children are hospitalized in mental hospitals because they have an addiction to smartphones (Abdussalam, 2019). Director of RSJ Jabar, Dr. Elly Marliyani, said that currently, addictive smartphones could make children become people with mental problems.

According to several sources, including online articles and research that has been done, said that ADHD has a more considerable risk of gaming addiction. According to news on CBC News in April 2013, people with ADHD and Asperger's are very vulnerable to addictive gaming (Dwiputra, 2018). Other articles also convey that children who often play games show symptoms of ADHD (Asrianti, 2018). Dr.

Perry Renshaw, a psychiatrist from the University of Utah researching addictive games for Fifteen years, found that addictive games can occur more in children with ADHD. In addition, according to research from the University of Southern California, adolescents who use technology excessively have twice the risk of showing symptoms of ADHD (Ra, 2018). ADHD is a developmental and neurological barrier characterized by difficulty in self-control, difficulty in attention or focus, hyperactivity, and impulsivity, which causes difficulty behaving, thinking, and controlling emotions, which hinder daily life (Mangunsong, 2011). Based on several previous articles, ADHD has a more significant risk for addictive gaming, and children who often play games will show symptoms of ADHD.

Previous research states that games can influence adolescent aggressive behavior (Amanda, 2016). The study is in line with the following research, "The Effect of Online Games on Behavior Change in Children of Samboja 1 Junior High School," which showed an effect of playing games on changes in student behavior. Changes in behavior occur in children in general, as well as children with special needs. For example, ADHD is a child with special needs who have characteristics that are constantly changing, impulsive and unpredictable. Currently, there are many cases caused by the addictive game. Hence, the need for further studies on the risk of addictive games on ADHD to take precautions and intervene earlier when addictive symptoms arise can control the use of games on children with special needs.

## **METHOD**

This research uses a qualitative method with a case study approach. According to Sukmadinata (2005), qualitative research analyzes phenomena, events, social activities, attitudes. This type of qualitative research is very suitable for analyzing this research. This type of research is a case study. According to Bungin (2005), some of the strengths of case studies are that they provide information about variables and processes that require broader explanation and understanding, provide insight into the basic concepts of human behavior, and present data or findings to build greater and more profound research. The presence of researchers in this study is as an instrument or research tool. According to Sugiyono (2018), data collection is carried out through various places or circumstances, sources, ways, and natural settings. Data collection techniques are by interview, observation, and documentation. Checking the validity of the data from the three data collection techniques used by researchers is triangulate data.

Data analysis was carried out before going data collection, during data collection, and after data collection. After the interview, the researcher analyzes

the answers of the interviewees. If the answers are not satisfactory, the researcher will conduct an interview again, to a certain extent, to obtain data that is considered credible. Qualitative data analysis is carried out continuously until it is complete so that the data is already saturated (Miles & Huberman, 1984). Data analysis was performed using three techniques, data reduction, data presentation, concluding, and data verification. Data reduction is summarizing, choosing main points, focusing on essential things, grouped by themes and answer patterns. The next step after data reduction is data presentation. The presentation of data in qualitative research is in the form of a brief description and charts. The conclusion in qualitative research is a new finding that has never before existed. Findings in the form of descriptions or pictures of previously still faint objects after being investigated again become clearer (Sugiyono, 2018).

The first is the stage of research preparation that prepares things needed when research, research design, insights on the study of theories related to research to understand the fundamental problems. The second is data collection with the three techniques, interviews, observation, and documentation. After that, it is processed by data reduction and data triangulation. Data reduction summarizes choosing things that often appear in research and grouped according to the focus of the answers. After the reduction is made, the next is the presentation of data. Again, the presentations have been grouped and categorized according to aspects that have been found. The third step is concluding and verifying data. Finally, conclusions with valid and consistent data evidence, the study's conclusions can be said to be credible.

## **FINDING AND DISCUSSION**

### **Finding**

Addictive characteristics of games in ADHD are grouped into three broad lines, a) Communication and language, b) Behavior, c) Psychological Symptoms. The addictive characteristics of smartphone games on ADHD can be briefly seen in Table 1.

#### *Communication and Language*

The first characteristic of communication and language is that children experience delays in verbal communication skills. Children should communicate verbally with others at the age that children cannot and imitate game sounds. Second is the child always conveys desires and answers instructions in repetitive

**Table 1. Addictive Characteristics of Smartphone Games on ADHD**

No	Aspect	Characteristics
1	Communication and Language	Having delayed verbal communication skills Conveying desires and answering instructions or questions in repeated language The child imitates words, sounds, notes, and rhythm in the game
2	Behavior	Imitate the action in the game There are many ways that children do so they can play the game Just focus when playing games
3	Psychological Symptoms	Children's feelings change easily It cannot be controlled to stop playing games Up to tantrums when prohibited from playing games

**Table 2. Addictive Impact of Smartphone Games on ADHD**

No	Aspect	Impact
1	Attitudes and Behavior	<ul style="list-style-type: none"> <li>Indifference and impatience in routine</li> <li>Self-harming behavior</li> <li>Conduct behaviors that harm others</li> </ul>
2	Academic Ability	<ul style="list-style-type: none"> <li>Less learning interest</li> <li>Concentration is easily distracted when studying.</li> <li>The child's academic ability is delayed</li> </ul>

**Table 3. Addictive Handling Efforts to Smartphone Games on ADHD**

No	Handling Efforts
1	Use of the game is stopped
2	Avoid war-themed shows or attacking things
3	Lower the facilities that support children playing games
4	Encourage children to do fun activities
5	Be firm and consistent
6	Provide the therapy to children
7	Good cooperation from parents, teachers, and people around

language. For example, the words that he repeated such as going to “eat, eat, eat, pee pee pee, no no no, stop stop stop.” The third is that the child imitates words, sounds, notes, and rhythm in the game almost every time. Children talk as if they are playing games, such as “attack, move forward, destroy.” The child always murmurs sounds he hears in games, like ju ju ju ju, em em em em, and other unclear sounds.

*Behavior*, Behavior that appears in ADHD is an addictive game, and the first is that the child imitates the action in the game. The behavior of imitating

movements is done suddenly, when eating, learning, playing, children suddenly imitating action in games, such as lying down, climbing, hiding behind objects, shooting, and others. Sometimes the items around are also used as firing or pistols, such as pens, pencils, and books. Second, children do many ways to play games by looking for hidden smartphones. Even in places that are difficult to reach, he still finds it. Children steal the opportunity to hold people's smartphones around and download the game themselves if the desired game is not on the smartphone he is holding. The third is the child's focus when playing games. Children with ADHD have the unique characteristics of being inattention, hyperactive and impulsive. Conversely, when a child with ADHD is addicted to the game, the child will focus and concentrate fully on his game until there is no response when called.

*Psychological Symptoms*, Here are some psychological symptoms that appear as addictive characteristics of smartphone games in ADHD. The first is that children's feelings are more easily changed. Children with ADHD can easily change their feelings and emotions caused by things that are not liked or certain things. When the child is angry, the child will bang on the table, banging hands, with furious noises. Second, the child cannot be controlled to stop playing games. The child is angry and upset. Third, children are angry to tantrums when they are prohibited from playing games. Some efforts such as prohibiting children from playing games are also made. Addictive child responses to the game will become angry and tantrums. Fourth, angry children slam objects like doors, smartphones. The child is angry, panicked, uncomfortable, and the child can bang himself on the floor.

These characteristics have an impact on children's daily lives. Addictive smartphone games on ADHD can impact two things, a) Impact on attitudes and behavior, b) Impact on academic ability. The addictive impact of smartphone games on ADHD can be briefly seen in Table 2.

*Impact on attitudes and behavior*, The impact on attitudes and behaviors that arise is an indifferent attitude to the routine that he should do when children play games. When children play games, children will ignore eating, bathing, to school. Children will be angry when children play games, then invited to eat or go to school. The second is to conduct self-harming behavior. Children hurt themselves or self-abuse. When prohibited from playing games, the child hurts himself by lying on the floor, banging his head, rolling in front of the school paving. Children can also endanger themselves when imitating sports movements, such as climbing and jumping from high places. The third is that the child performs behaviors that endanger others. For example, the child has seen a war-themed game. It can affect the attitude of children, and children will be

more courageous. When a child is beaten and pushed by his brother, the child responds to push and hit. Then he quickly gets emotional when tempted, then hits spontaneously. In addition, the imitation behavior done by children is to use items around them used as tools for shooting. This behavior can endanger others when the child is holding a real weapon.

*Impact on academic ability,* Children with ADHD barriers that are being addicted to games show three impacts on academic ability, and the first is lack of interest in learning. Children prefer playing games rather than learning. Children always run to the teacher's room to play games on the computer. Children must be forced so that children want to go to the classroom to learn. The second impact on academic ability is concentration easily distracted when studying. The child's concentration is very easily distracted by the things he uses to demonstrate the game. As a result, when entering into learning, children become unfocused. For example, the child makes a "bang bang bang bangbang," pencil is used for toys while saying "re re re re." The third impact is that the child's academic ability is delayed. Learning outcomes in children with the concentration that easily distracted is less so that academic results are achieved later than when children with ADHD are not addicted to the game.

The surrounding environment has made efforts to deal with addictive games for children, including families and teachers. The opinions of psychologists also support the results. There are seven points of handling efforts made in children with ADHD that are addictive to the game. Efforts to deal with addictive smartphone games on ADHD can be briefly seen in Table 3.

First, the use of the game is stopped. Even if the child plays the game for only a short time, he will be reminded of the game and behave imitatively or imitate the behavior and sound in the game. In addition, children are not allowed to play games because when children are given time to play first, children are increasingly angry, and difficult to be invited to the classroom to learn. Second, avoid war-themed shows. Children's behavior is very influential on the theme of the game being played. Children play war-themed games, so children imitate shooting action and imitate gunshots. Children also attack, push and hit others. Third, reduce the facilities that support children playing games.

The internet quota is reduced or turned off, the WiFi speed is lowered, and the quality of the smartphone is lowered so that when children want to play games, children cannot play because of limited facilities. Fourth, encourage children to do fun activities and sports. Children are invited to exercise to take advantage of excessive movement in children to be easier to be invited to learn or do valuable activities. Then, children are better given real games, like biking

and jumping rope. Fifth, be firm and consistent so that children know what to do and what should not be done, and the child is more focused when listening. Firmness and alertness to teachers can also reduce the risk of children doing behaviors that endanger themselves or others. Sixth, giving therapy to children in order to change their behavior periodically. Some therapy can be given to children with ADHD who are addicted to games, behavioral therapy to increase concentration. Concentration exercises such as tracing, inserting beads, and coloring needs to be done to increase the child's concentration so that it is not easily hit. Fourth, behavioral therapy improves obedience so that children obey the instructions given, and consistently children want to do without being given a prompt. This therapy can also reduce the effects of addictive games on children and can control children to stop playing. The following therapy is sensory integration therapy. Sensory integration therapy is used to utilize excessive energy and movement of children. The seventh treatment effort is good cooperation from parents, teachers, and people around. Lack of cooperation will result in inconsistent interventions. The inconsistency of giving interventions to some people will have a significant impact on children's behavior. Children will become lazy and at the will of their own accord. Good cooperation includes communication links between parents and teachers so that the handling given to children is consistent and everyone around does not give games to children.

## Discussion

Some addictive characteristics of the game in ADHD are grouped in communication and language. The first is children experiencing delays in verbal communication skills. The task of developing children aged 0-6 years is learning to speak. Children learn to speak from imitation (Yusuf, 2001). Therefore, children hear game sounds more often than talking to people around them. Children only imitate game sounds and make children experience delays in verbal communication with others because what children say is game sounds. The second characteristic is that the child conveys desires and answers instructions or questions in a repetitive language such as "eating, eating, drinking drinking drinking, pee pee, playing games, no-no, yes yes yes yes, what is nothing." It is consistent with the opinion of Hallahan, Kauffman & Pullen, 2019 in Mangunsong (2011) that one of the identical characteristics in ADHD is perseverative behavior, behavior that tends to repeat activities continuously. The third characteristic is that children imitate words, sounds, notes, and rhythm in games. Children always imitate words, sounds, and a rhythm at any time. Sometimes children mumble with voices

that are not clear and have no meaning. It follows the characteristics of hyperactivity in ADHD, where children always talk excessively and issue language that has no meaning (DSM IV, 1995 in Baihaqi and Sugiarmmin, 2006).

Addictive characteristics of the game in ADHD are also seen in the behavioral aspect. First, the child imitates the action in the game. According to an article on *Republika.co.id* that refers to Dr. Perry Renshaw, the impact of excessive playing games, ADHD symptoms will appear, impulsive and hyperactive, so children with ADHD that are addictive to the game will also experience an increase in hyperactivity and impulsivity. Increased hyperactivity is shown when children imitate action in games, such as shooting, lying down, climbing, and others. According to Santrock, 2002 in Marlina (2015), children with ADHD do many physical activities. In addition, according to Young (2009), addiction makes someone fantasize about games when doing other things. The second behavior is that children do many ways in order to be able to play the game. According to Griffiths (2008), there are symptoms in someone who is addicted to the game. One of them is to do everything possible to play the game. It is the same as that done by children with ADHD who are addicted to games. For example, the child seeks a hidden smartphone, steals the chance to hold the smartphone, and downloads the desired game if it is not on the smartphone he is holding. The third is the child's focus when playing games. It is supported by the opinion of Eva (2015) that children with ADHD will focus on the things they like, like playing games.

Psychological symptoms include the addictive characteristic aspects of gaming on ADHD. The first psychological symptom is that the child's feelings change quickly, seen when the child is more easily angry with things that he does not like, then returns happy when he gets what he wants. Following Lemmens et al. (2009), there are several addictive characteristics to the game: withdrawal, being an emotional child, easily moody, and being quick to get angry when not playing games. It can be seen when angry, and the child is banging on the table, banging hands, making loud noises. Second, the child cannot be controlled to stop playing games. According to Marlina (2015), impulsivity is the ability to control behavior. ADHD addicted to games will find it very difficult to control their behavior to stop playing because playing games is their desire. The third is that the child will be angry to tantrums when prohibited from playing games. Children are angry, panicked, uncomfortable, anxious, and perform behaviors that endanger themselves (self-abuse) and others. According to Marlina (2015), children with ADHD have impulsivity because children are always impatient if they want something, including games. Angry behavior of children to tantrums, when

prohibited from playing games, is also caused by impulsivity in children.

Addictive smartphone games on ADHD can impact two things, a) Impact on attitudes and behavior, b) Impact on academic ability. The impact on attitudes and behaviors that arise is that of indifference to routine. According to the article on *alodokter.com*, addictive children find it difficult to play other more valuable activities. Children will be angry when playing games, invited to eat, take a bath, or do another routine. Children also experience eating disorders and sleep patterns when the child is playing games. It was also conveyed by Griffiths (2008) that children with addictive games will experience eating disorders and sleep patterns. The second is self-harming behavior. Children with ADHD will do dangerous actions without thinking before (Marlina, 2015). It also happens to children with ADHD who are addicted to games. Children will conduct self-harming behavior or self-abuse, without the child thinking in advance that his actions will endanger himself when children imitate the action in the game, such as climbing, lying down, jumping to and fro, and jumping from a height like cupboards. Third, children perform behaviors that endanger others. According to Marlina (2015), children with ADHD can perform dangerous actions without thinking beforehand, such as easily repaying punches and encouraging others who hit them. In addition, the child always imitates the child's game action, using the surrounding items to be used as a gun. It will endanger others when children hold real weapons. In addition, it is also caused by controlling disrupted behavior, so that it can harm another person in around (West & Hardy, 2005).

Children with ADHD's addictive game barriers also show three impacts on academic ability. First, lack of interest in learning. According to Chen and Chang (2008), one addictive aspect is a compulsion, a constant urge to play games. When children are invited to learn, children will find ways to be able to play games. The child will run to look for games when the child is learning time. The following opinion also supports this behavior that the characteristics of ADHD are complex for children to start learning activities (Baihaqi & Sugiarmmin, 2006). Second, concentration is easily distracted with objects around the child. These objects are used to demonstrate behavior in games, such as shooting. Sometimes books are also used as smartphones as they are being played. Based on DSM IV (Westwood, 1995 in Marlina, 2015), children's activities, including learning, are often abandoned by children because their concentration is easily distracted by things that are considered attractive, such as surrounding items that they can use to demonstrate game movements. The third is the academic ability of children experiencing delays. It is due to the small learning outcomes of

children due to the concentration of children who are easily distracted. Difficult children concentrate on the tasks they do, challenging to complete, children tend to avoid tasks that use much effort. In addition, children are also not concentration when working on assignments (Rief, 2005 in Mangunsong, 2011).

According to Schoenmacker et al. (2018), ADHD does not affect addictive alcohol or drugs, but it is addictive due to the effects of child behavior. In contrast to games, ADHD, which lacks attention that causes gameplay habits, increases, so special handling is needed for addictive games on ADHD. They are handling efforts that have been made by parents and teachers, as well as opinions from psychologists about the handling of addictive smartphone games on ADHD. The first is that the use of the game is stopped because even if only briefly, the child will still remember the game, and the child will imitate what he sees, both behavior in the game to the language. If the child is given little time to play, the child will find it challenging to release the game. Children will not want to do routines and are increasingly angry. Griffiths (2008) said that if various attempts have been made but still fail, the child must be prohibited from playing games. Second, avoid war-themed shows or things that attack because children will imitate shooting movements, gunshots, jumping from heights, climbing, and of course, the behavior is hazardous. This effort is consistent with Henry's (2010) opinion, which avoids FPS or First Person Shooter-themed games, which use a first-person perspective with a shoot-out theme. Third, reduce the facilities that support children playing games. In an article on kompas.com, parents can decide not to use a WiFi internet connection to reduce addiction in children. This effort is one of the efforts to reduce facilities that support children to play games.

Fourth, encourage children to do fun activities. This effort is in accordance with the opinion of Griffiths (2008), the child is taken to a place that he likes in real life, doing actual activities, but still stimulates adrenaline. It is done so that children get the same pleasure when in real life. Fifth, be firm and consistent. Opinions from Baihaqi & Sugiarmin (2006) say the same thing, the beginning of an intervention is the stipulation of clear, firm rules and instructions supported by people. Firmness and consistency so that children know clearly what can and cannot be done. Firmness and alertness can also prevent children from doing harmful behavior. Sixth, giving therapy to children. Therapy given to children with ADHD is expected to be able to change their behavior periodically. Some therapy can be given to children with ADHD who are addicted to games, behavioral therapy (increasing concentration). According to Griffiths (2008), behavioral therapy is given with specific interventions according to children's barriers. For

example, children have concentration obstacles easily and are given interventions to improve concentration, such as tracking the path, inserting beads, and coloring.

Furthermore, behavioral therapy increases obedience aimed at making children obedient to the instructions and regulations that have been set and do without being given a prompt. It is consistent with the following opinion. First, several things are done related to behavioral management, namely, the child is given instructions and responses or consequences (Rief, 2005 in Mangunsong, 2011). Second, sensory integration therapy should also be applied to children with hyperactivity, especially ADHD, such as transferring objects, jumping on a trampoline, riding a swinging bridge, seesaw, and sliding on a skateboard. Sensory integration therapy can reduce hyperactivity and overcome the lack of attention in children (Yasri, 2014). Seventh, Good cooperation from people around. The handling of ADHD is an additional treatment that supports the surrounding environment for handling (Mash and Wolfe, 2005 in Eva, 2015). Fourth, teachers can provide learning methods that can improve academic abilities in children. Addictive ADHD games are difficult to focus on, so the child's academic ability is slow, so the appropriate learning method is needed. One of them with the inquiry method. According to Wibowo (2019), the inquiry method can improve academic abilities in children with ADHD and increase children's enthusiasm when learning to focus on learning. The same thing is done by people around, including parents, to stay away from the game and make other efforts to help the child's development. Everyone must work well together so that the addictive level of games in children decreases.

ADHD and addiction are very related. The addictive of the children, increasing the level of inattentive, hyperactivity, and impulsiveness of ADHD. Children with ADHD who have impulsive, hyperactive, and inattentive behaviors will exhibit a more considerable risk of addiction than children in general. It is supported by Spiliotopoulos et al. (2012) that someone who has symptoms of impulsivity, hyperactivity, and symptoms of less attention will have a higher risk of addictive games. The relationship between ADHD and addiction to games has also been proven in observational studies by Hyun et al. (2015) and also proven by pharmacological studies that ADHD drugs, namely methylphenidate, and atomoxetine, can reduce game addictive symptoms (Park, Lee, Sohn, & Han, 2016; Weinstein & Weizman, 2012).

The addictive level of ADHD that is addictive to games is higher than children in general who also have addictive games, which can be seen from the characteristics and addictive effects of games on ADHD in this study. Furthermore, it can be strengthened from research conducted by Kim et al. (2020). The study was

conducted on addictive ADHD games and non-addictive ADHD games. They are working on a questionnaire used to detect addictive levels in the game, which is the Young Internet Addiction Scale (YIAS). As a result, addictive ADHD games get high scores compared to kids in general who are addictive games. Thus, it shows that there is a close relationship between ADHD with addictive games. In addition, the study also resulted that there was a higher inhibitory function of sensory integration in ADHD with addictive games compared to children in general who were addicted to games.

## CONCLUSIONS

Based on the research results obtained that ADHD with addictive games has a considerable risk than children in general who are addictive games. It is shown from the characteristics of ADHD, which have an addiction to the game. Addictive characteristics of the game on ADHD in aspects of communication and language: the child has a delayed ability to communicate verbally, the child conveys desires and answers instructions or questions with repeated language, and the child imitates words, voices, tones, and rhythm in the game. In the behavioral aspect: children imitating the action game, children do many ways to play games, and children focus when playing games. Characteristics are also seen with psychological symptoms: children's feelings change easily, children cannot be controlled to stop playing games, and children get angry to tantrums when prohibited from playing games. These characteristics have an impact on children's daily lives. Addictive smartphone games on ADHD can impact two things: attitudes and behavior and academic ability. In attitudes and behaviors, the impact is that children are indifferent to routines, children do behaviors that endanger themselves, and children do behaviors that endanger others. The impact on academic ability is lack of interest in learning, concentration is easily distracted when learning, and the child's academic ability is delayed. Seven efforts that can be made to handle addictive smartphone games toward children with ADHD: 1) the use of games to be stopped, 2) avoid war-themed shows, 3) reduce facilities that support children playing games, 4) encourage children to do funactivities, 5) be firm and consistent, 6) provide therapy to children, and 7) good cooperation from parents, teachers, and people around.

## REFERENCES

- Abdussalam, M. S. (2019). Usia 5 Tahun Dirawat di RSJ, *Tribun Jabar*.9.
- Amanda, R. A. (2016). Pengaruh game online terhadap perubahan perilaku agresif remaja di samarinda. *EJournal Ilmu Komunikasi*, 4(3), 290-304.
- Asrianti, S. (2018, September 28). Studi: Ada Kaitan Kecanduan Gim dengan ADHD. *Republika.co.id*. Retrieved from: <https://www.republika.co.id/berita/gaya-hidup/parenting/18/09/28/pfrm6t349-studi-ada-kaitankecanduan-gim-dengan-adhd>, Retrieved on 15 Oktober 2019
- Baihaqi, M, I, F, & Sugiarmim, M. (2006). *Memahami dan Membantu Anak ADHD*. Bandung. PT Refika Aditama
- Beranuy, M., Carbonell, X., & Griffiths, M. D. (2013). A Qualitative Analysis of Online Gaming Addicts in Treatment. *International Journal of Mental Health and Addiction*. 11(2), 149-161. DOI 10.1007/s11469-012-9405-2
- Bungin, B. (2005). *Analisis Data Penelitian Kualitatif*. Jakarta: Rajagrafindo Persada
- Chen, C. Y. & Chang, S. L. (2008). An Exploration of Tendency to Online Game Addiction Due to User's Liking of Design Feature. *Asian Journal of Health and Information Sciences*, 3(1-4), 38-51.
- Dwiputra, K. O. (2018, November 2). Terapi Khusus untuk Atasi Kecanduan Game Online. *klikdokter.com*. Retrieved from: <https://www.klikdokter.com/info-sehat/read/3617417/terapi-khusus-untuk-atasi-kecanduan-game-online>
- Eva. (2015). *Psikologi Anak Berkebutuhan Khusus*. Malang: Universitas Negeri Malang
- Griffiths, M. D. (2008). *Internet and video-game addiction. (CA Essau Der.)*, *Adolescent addiction: Epidemiology, assessment, and treatment*. London: Academic Press (s. 231-267).
- Henry, S. (2010). *Cerdas dengan Game, Panduan Praktis bagi Orangtua dalam Mendampingi Anak Bermain Game*. Jakarta: PT Gramedia Pustaka Utama
- Hyun, G. J., Han, D. H., Lee, Y. S., Kang, K. D., Yoo, S. K., Chung, U. S., & Renshaw, P. F. (2015). Risk factors associated with online game addiction: A hierarchical model. *Computers in human behavior*; 48, 706-713.
- Kim, M., Kim, D., Bae, S., Han, D. H., & Jeong, B. (2020). Aberrant structural network of comorbid attention-deficit/hyperactivity disorder is associated with addiction severity in internet gaming disorder. *NeuroImage: Clinical*, 27, 102263. <https://doi.org/10.1016/j.nicl.2020.102263>
- Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2009). Development and Validation of a Game Addiction Scale for Adolescents. *Media Psychology*, 12(1), 77-95. . <https://doi.org/10.1080/15213260802669458>.
- Mangunsong, F. (2011). *Psikologi dan Pendidikan Anak Berkebutuhan Khusus*. Depok: Lembaga Pengembangan Sarana Pengukuran dan Pendidikan Psikologi

- Marlina. (2015). *Asesmen Anak Berkebutuhan Khusus Pendekatan Psikoedukasional*. Padang: UNP Press
- Miles, M. B & Huberman, M.A. (1984). *Qualitative Data Analysis*. London: Sage Publication
- Park, J. H., Lee, Y. S., Sohn, J. H., & Han, D. H. (2016). Effectiveness of atomoxetine and methylphenidate for problematic online gaming in adolescents with attention deficit hyperactivity disorder. *Human Psychopharmacology: Clinical and Experimental*, 31(6), 427-432.
- Ra, C. K., Cho, J., Stone, M. D., De La Cerda, J., Goldenson, N. I., Moroney, E., ... & Leventhal, A. M. (2018). Association of digital media use with subsequent symptoms of attention-deficit/hyperactivity disorder among adolescents. *Jama*, 320(3), 255-263.
- Schoenmacker, G. H., Groenman, A. P., Sokolova, E., Oosterlaan, J., Rommelse, N., Roeyers, H., Oades, R. D., Faraone, S.V., Franke, B., Heskes, T., Vasquez, A. A., Claassen, T., Buitelaar, J. K. (2018). Role of conduct problems in the relation between Attention- Deficit Hyperactivity disorder, substance use, and gaming. *European Neuropsychopharmacology*, 30, 102- 113. <https://doi.org/10.1016/j.euroneuro.2018.06.003>
- Spiliotopoulos, D., Tzoannos, E., Stavropoulou, P., Kouroupetroglou, G., & Pino, A. (2012, July). Designing user interfaces for social media driven digital preservation and information retrieval. In *International Conference on Computers for Handicapped Persons* (pp. 581-584). Springer, Berlin, Heidelberg.
- Sugiyono. (2018). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.
- Sukmadinata, N. S. (2005). *Metode Penelitian Pendidikan*. Bandung: Remaja Rosdakarya
- West, R & Hardy, A. (2005). *Theory of Addiction*. London: Blackwell Publishing Ltd
- Wibowo, E. W. (2019). Application of Inquiry Methods for Academic Achievement of Children with Attention Deficit Hyperactivity Disorder in Inclusive Schools. *Jurnal Penelitian dan Pengembangan Pendidikan Luar Biasa*, 6(1). Retrieved from: <http://journal2.um.ac.id/index.php/jppplb/article/view/9076>
- Wikipedia. (2019). *Asisten Digital Pribadi*. Retrieved from [https://id.wikipedia.org/wiki/Asisten\\_digital\\_pribadi](https://id.wikipedia.org/wiki/Asisten_digital_pribadi)
- Yasri, H. T. (2014). *Efektivitas terapi sensori integrasi terhadap penurunan perilaku hiperaktif anak ADHD di Pusat Terapi Fajar Mulia Ponorogo. Undergraduate thesis*. Retrieved on 21 April 2020, from E-Reserve Universitas Islam Negeri Maulana Malik Ibrahim.
- Young, K. (2009). Understanding Online Gaming Addiction and Treatment Issues for Adolescents. *The American Journal of Family Therapy*, 37(5), 355- 372. DOI: 10.1080/01926180902942191
- Yusuf, S. (2001). *Psikologi Perkembangan Anak dan Remaja*. Bandung: Remaja Rosdakarya