The Influence of Educative Puzzle Game to Concentration of Children with Attention Deficit and Hyperactivity Disorder In Arogya Mitra Acupuncture Klaten

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Abstract. ADHD is characterized by attention deficit, impulsivity and hyperactivity disorder that is not in accordance with the child's developmental stage. These conditions certainly can cause various problems such as learning, behavior, and social difficulties, and one of them is difficult to concentrate. One of the efforts to increase concentration on children with ADHD is through educative puzzle game. This study aimed to determine the effect of educative puzzle game on concentration of children with ADHD. The study design used was pre-experimental with the one group pretest and posttest design. We used purposive sampling to collect the sample with total samples were 15 respondents. We used concentration questionnaire as an instrument and we analyzed with paired t-test. Concentration scores before given the educative puzzle game was 7.53 (SD ±3.021), which was in the low category. Meanwhile, concentration scores after given the educative puzzle game was 11.80 (SD ±4.074) win the medium category. The score increased about 4.27. Paired t-test results showed p value < alpha (0.000 <0.05). The conclusion of this study suggests that educative puzzle game affect the concentration of children with attention deficit and hyperactivity disorder (ADHD) in Arogya Mitra Acupuncture Klaten.

1. Introduction

Soetjiningsih (2012, p.248) explained that in school-age children, there are several developmental tasks that must be completed. These developments include learning the possibility of physical or agility, forming a healthy attitude towards oneself as a person who grows and develops, learns the role of gender with peers, learn to interact with friends, develop basic abilities in reading and arithmetic, and develop conscience and learning to shape attitudes. However, in the developmental task of the child, not everything goes accordingly. This is due to the emergence of problems that occur in children (Santrock, 2011, p149).
Problems that cause the non-fulfillment of developmental tasks include physical problems, eating disorders, acute and chronic diseases, and behavioral disorders. One behavioral disorder that can occur is attention deficit and hyperactivity disorder (ADHD) (Wong, 2009, p666).

Attention deficit and hyperactivity disorder (ADHD) symptoms of inclusion (Marcdante, 2014, p52). Soetjiningsih (2013, p416) also said GPPH is a biological disorder in chronic brain function that causes cognitive dysfunction (executive function) that is not in accordance with the child's development. Attention deficit and hyperactivity disorder is one of the problems often experienced by school-age children. School-age children with attention deficit disorder and hyperactivity will appear to exhibit hyperactivity, impulsivity, difficulty focusing attention that arises more often, more persistently with more severe levels compared to other children of their age. (Sari, 2015).

Concentration problems and hyperactivity in children can occur at an early age (before age 7 years). This age, if not handled properly, will remain in adolescence or adulthood with the main characteristics of being unable to focus attention, hyperactivity and impulsivity (Muhith, 2015, h414). ADHD symptoms in children based on a certain developmental age that are normal cause difficulties when giving a diagnosis. For example a young age children are usually talkative, impulsive and very active. A child who is tired will become less attentive and will have poor concentration. Criteria for children categorized as ADHD are children who experience these symptoms which lasts for 6 months. (O'brien, 2014, p251).

ADHD prevalence in Indonesia is between 0.4% and 26.2%. Male and female ratio was 2:1. Symptoms of ADHD persist until adolescence in 60%-80% of patients and some continue into adulthood (Marcdante, 2014, h54). Symptoms of hyperactivity and impulsivity ADHD often changes or decreases during adolescence or in early adolescence even though symptoms are less attention and poor concentration. Research in elementary school Sleman Yogyakarta in 2000 showed a prevalence of ADHD 9.5%, while the prevalence of GPPH elementary school children in DKI Jakarta was as much as 26.2% in the age range of 6-13 years (Hidayani, et al, 2013). This is supported by Sholaichah research (2017) conducted in Boyolali that there are (61%) children who are at risk of ADHD.

Based on data from the Central Statistics Agency, the number of children with special needs in Indonesia reached 1.6 million children. In addition, there is prevalence in children aged 24-59 months who have a disability. The disability in question is all the disabilities that can be observed including due to illness or accident trauma. Children with disabilities include children with special needs (blind people, speech impaired, down syndrome, deaf disabled, cleft lip) (Riskesdas, 2013).

Increased ADHD cases certainly have an impact on various aspects of a child's life. These impacts include emotional disturbances, psychological disorders, and maladaptive behavioral patterns. This causes disruption in psychosocial adjustments and most clearly affects the ability in learning activities (Wong, 2009, p636). In learning activities, children often lack concentration, do not want to sit and be quiet in a place that leads to lack of learning achievement and is labeled as a naughty child (Soetjiningsih and Ranuh, 2015, p418).

Research results by Rahma (2014) showed that there were as many as hyperactive children (22%) who had binge eating, (33.3%) were in the category of over nutrition or obesity. Another thing that is common between anxiety and easily solved another concentration. These problems are more often observed in difficult and repetitive tasks or tasks that are considered boring children (Santrock, 2011, p166). Ministry of Health (2011) explains that approximately 10-90% of children who suffer ADHD also experiencing specific learning difficulties. Difficulties found by children with ADHD are more related to memory, executive function and concentration.

Concentration is a way for children to focus on doing or doing something so that it can be done in a certain time (Wulansari, 2017). Children with ADHD can easily switch their attention from an activity to another activity so that the time span is very short compared to other children of the same age. Symptoms of lack of concentration that occur in ADHD children can interfere with the child's
development in terms of cognitive, behavioral, socialization and communication. Some behaviors that appear such as; tend to act recklessly, easily offended, forget school lessons and homework assignments, difficulty working on tasks, difficulty in carrying out orders, dreamy, emotional, like to cut the talks could go forward as, difficulty in listening and often making noise is a form of general behavior that characterizes children with ADHD who are less concentrated (Hastiningsih, 2013, p325). In accordance with Ainusyifa research (2012) that there were ADHD (6.3%) children who were lazy to learn and (17.5%) had high emotions.

As one of the efforts that can be done in handling this can be done with early treatment. Handling in ADHD children in addition to medical treatment with medication, can be given management of behavior modification therapy, sensory integration therapy, music therapy, conservative therapy, brain wave therapy and play therapy (Santrock, 2011, p166; Muhith, 2015, p427).

Play therapy provides a sense of security, attention, and environment that can accept children to express their feelings and social exercises to help children overcome maladaptive behavior or traumatic experiences (Susana, 2011, p58). Play therapy for people with ADHD can be used to minimize or eliminate aggressive behavior, self-harm behavior, and eliminate useless behavior. This can be done by training certain movements for children, such as applause, stretching out hands, composing puzzles, playing hammers and pegs and other playing tools. Introducing children to constructive games like puzzles will also help children get to know the order, help develop motor, and developing cognitive (Muhith, 2015, p427).

Azmira (2015, p104) explained that composing puzzles is believed to increase children's concentration which often occurs in hyperactive children. Iswinarti and Cahyasarj (2017) stated that in children with ADHD can be given play therapy in increasing children's concentration, the results of the study show that the traditional game "engklek" able to increase the concentration of children with an increase in concentration of 36%. The results of research by Ramadhani, et al (2016) showed that there was a significant effect of puzzle play therapy on the concentration of children's learning as many as 31 respondents in the first grade of Pokoh Elementary School. Research by Perdana (2013) conducted with a qualitative descriptive of 2 children with hyperactivity, indicating that puzzle play therapy given to children can be improved in terms of concentration which has been good. This study aimed to determine the effect of educative puzzle game on the concentration of children with attention deficit and hyperactivity disorder (ADHD).

2. Methods
This study used pre-experimental with one group pretest posttest design. We only used one treatment group without control group. The intervention group was given the initial test (pretest) then we gave the treatment in the form educative puzzle game in 5 days consecutive for 15 minutes. After 5 days, they received the final test (posttest) in order to give grace period between pretest and posttest, so respondent didn’t remember question and answer.

Data collection was carried out on May 14th -18th, 2018 at Arogya Mitra Acupuncture Klaten. The pretest and intervention began on May 14, 2018 and the posttest was held on May 18, 2018. The population in this study was 49 children with ADHD who were diagnosed by a doctor in Arogya Mitra Acupuncture Klaten. The sampling technique uses purposive sampling. The number of samples obtained was 15 respondents with defined inclusion and exclusion criteria. The inclusion criteria was children who diagnosed with ADHD, aged 6-12 years old, duration of treatment ≤ 1 month, who live in dormitory and were willing to become participants who were approved by the guardian (parents/caregivers). While, the exclusion criteria was respondents who experienced speech disorder, hearing impairment, physical disability and respondents who were absent (sick).

The instruments used in this study were Construction Puzzles, measurements and tools, demographic data, cameras for documentation and questionnaires with 19 items of questions made by the researchers themselves. The questionnaire has been tested for validity and reliability by researchers in
the SLB Lentera Harapan in number of 20 respondents with the Pearson correlation minimum score> 473, which states that r count > from r table (0.444). Whereas for Reliability to get results is 0.98643 so the questionnaire is declared reliable.

We conducted analysis bivariate with paired t-test. This study used significant level 0.05. Before we performed t-test, firstly we run normality test using Shapiro-Wilk test because the amount samples were less than 50.

3. Results

Table 1. Concentration Score

| Variable          | N  | Min | Max | Mean  | SD   |
|-------------------|----|-----|-----|-------|------|
| Concentration Score Pretest | 15 | 3   | 13  | 7.53  | 3.021|
| Postest           | 15 | 5   | 18  | 11.80 | 4.074|

Based on table 1 above shows that respondents before being intervened with educational puzzle game tools obtained an average value of 7.53 with SD 3.021. Whereas after the intervention the puzzle educational game tool was obtained with a mean value of 11.80 with SD 4.074.

Table 2. Concentration Score before and after being given APE Puzzle construction.

| Variable | Average | N | Mean  | SD   | Std. Error | PValue |
|----------|---------|---|-------|------|------------|--------|
|          |         |   | Mean  | SD   |            |        |
| Pretest  |         | 15| 7.53  | 3.021| 0.780      | 0.000  |
| Postest  |         | 15| 11.80 | 4.074| 1.052      | 0.000  |

* t-test

Based on Table 2 above shows that the results of the concentration before being given educational puzzle game equipment obtained a mean of 7.53 pretest with SD = 3.021. Based on the table above shows that the results of concentration before being given educational puzzle game tool obtained the pretest mean of 11.80 with SD 4.074.

4. Discussion

4.1. Effect of Educational Puzzle Game Tools

The results showed that the respondents before intervention with educative puzzle game obtained a mean value 7.53 (SD ±3.021). Minimum and maximum score of concentration were 3 and 13, respectively. While after intervention, the mean score was 11.80 (SD ±4.074) with a minimum and maximum score were 5 and 18, respectively.

These results show that there is an increase in value from before and after being given therapy to educational puzzle game equipment for 5 consecutive days. P value obtained significant value 0.000 or p value <0.05, so that the p value is smaller than alpha (0.000 <0.05). So it was found that therapeutic games for educative puzzle games affect children's concentration with GPPH in Arogya Mitra Acupuncture Klaten. Concentration is a way for children to focus on doing or doing something so that it can be done in a certain time (Wulansari, 2017). Concentration is important to be honed, especially for ADHD children. When children are able to concentrate, they will automatically be able to capture information obtained from the surrounding environment (Cahyasari, 2016). Engkoswara in Setiani (2014) explained that children are said to be able to concentrate on having several characteristics shown such as cognitive behavior, affective behavior, psychomotor behavior and language behavior. Concentration is not associated with high and low intelligence but the function of the brain that works not like a normal child.

Factors affecting barriers ADHD concentration in children is associated with growth inhibition system. The development of inhibition systems develops smaller, so that the inhibiting system in the
brain is less powerful which causes children to tend to be difficult to control their activities. In addition, there is a colossum pre frontal layer that connects the left and right brain hemispheres, 5-6% smaller basal nucleus and a disturbance in the neurotransmitter, dopamine and adrenaline. (Paternotte & Buitelaar, 2010).

As one of the efforts that can be done in this case can be done with early treatment. Handling in ADHD children in addition to medical treatment with medication, can be given management of behavior modification therapy, sensory integration therapy, music therapy, conservative therapy, brain wave therapy and play therapy (Santrock, 2011, p166; Muhith, 2015, p427). Erinta (2012) explained that types of games such as throwing balls, swings, ball relay and puzzles can help reduce impulsive behavior in GPPH children so that they focus and concentrate.

Azmira (2015, p104) explained that composing puzzles is believed to increase children's concentration which often occurs in hyperactive children. In line with Perdana (2013) study conducted with a qualitative descriptive of 2 children with hyperactivity, showed that puzzle play therapy given to children can experience improvement in terms of concentration that has been good.

Fajar (2017) explained that playing puzzle is an easy way to train brain function. When a child matches one color to another or arranges a building, the brain releases the dopamine hormone, a chemical compound in the brain that functions to convey messages to the nerves that function to improve the ability of the brain. While playing the puzzle, then the child will form something of mind that is able to develop and train the brain concentration.

This research was conducted can not be separated from several obstacles experienced that can affect the results of treatment. The obstacle experienced was that the researcher did not involve other people in conducting pre and post-test observations. Assessment is only done by researchers in a long time, so as to enable ineffectiveness of researchers in providing assessments. The researcher suggested to the next researcher to research using a qualitative research design in order to know the character and concentration of the child deeply.

5. Conclusion
The results and discussion about influence of play therapy to concentration children with attention deficit and hyperactivity disorder, we can concluded that there is influence educative puzzle game against concentration children with attention deficit and hyperactive with p-value < alpha (0.000 <0.05).

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