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Optimizing Puzzle Media to Reduce Hyperactive Behavior in Early Childhood

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Abstract

Hyperactive behavior in Early childhood such as difficulty focusing, impulsivity, and spontaneous aggressiveness, is a problem that needs to be addressed early interactive learning media, such as puzzle are believed to improve children's concentration self- control and social skills. This study aims to determine the effect of optimizing puzzle media to reduce hyperactive behavior in early childhood. The research approach uses a descriptive qualitative method with one subject with the initials D, who exhibits hyperactive behavior in BA Aisyiyah VII Grogol. Data were collected through observation, interviews with teacher and parents documentation of photos and children's work and a questionnaire on the frequency of hyperactive behavior. Data analysis follows the Miles and Huberman Model (1994) through data reduction, presentation, and verification through triangulation. The result of the study show that providing puzzles regularly twice per week for three months improves children's focus reduces impulsive behavior spontaneous aggressiveness, improves the ability to complete task, and improves social skills and cooperation. Teachers and parents also reported. Prove positive changes in children's self control. Thus optimizing puzzle media is to be proven effective as a learning strategy to reduce hyperactive behavior while improving self-regulation and social skills in early childhood improving self regulation and social skills is early childhood.

Keywords: Child Behavior, Early childhood, Hyperactive Learning Media, Puzzle

Introduction

Hyperactive behavior in early childhood is one of the challenges in the learning process in early childhood education institutions. Children with hyperactive behavior tend to have difficulty concentrating are unable to sit still, and frequently move from one activity to another (Puspitasari & Ulum, 2020). This condition makes it difficult for children to follow teacher instructions and are easily distracted by their surroundings ultimately disrupt classroom order, resulting in a less than optimal learning process Hurlock (1978 in the UMS FKIP Team 2025) explains that hyperactivity is characterized by a tendency to act impulsively without considering the surrounding conditions. This show that hyperactive behavior can impact cognitive, social, and emotional aspects that are still developing. Therefore appropriate learning activities are needed to help children control themselves, channels energy positively, and gain meaningful learning experiences during learning activities.

Based on initial observations at a private Islamic early childhood education school in Sukoharjo Regency hyperactive behavior was found in several children demonstrated through impulsive actions, such as suddenly hitting friends. This behavior appears without clear consideration, both when waiting for their turn, or when asked to sit quietly and follow the teacher's instructions. This behavior appears without clear trigger. This finding is in line with the result by Bestira et al. (2024) who stated that hyperactive children tend to show impulsive actions in the form of sudden aggressive behavior without considering the consequences. Another study by Sholichah and Hasanah (2023) emphasized that high levels of hyperactivity make it difficult for children to control themselves and feel uncomfortable, so that thus affecting the learning atmosphere concentration, and social emotional development, especially in building positive interactions with friends. This condition emphasizes the role of teachers is very important in helping hyperactive children manage their behavior during learning activities. Rodhotul (2023) explains that hyperactive children tend to direct their energy and impulses on unplanned things, so teacher need to create a learning environment that can channel this energy positively. Therefore, teacher educators are required to be creative in choosing learning strategies that can improve concentration, build social skills, and help children understand class rules. This is in line with findings of Mulfiani et al. (2022) who emphasized that teacher support through interesting and meaningful learning activities has a significant influence in addressing children's social problems in kindergarten. Thus, learning strategies that are thematically relevant. directed, and appropriate to children's characteristics is needed so that hyperactive children can channel their energy positively, practice self control, and build better social interactions with peers.

Azizah and Wardhani (2022) stated that providing appropriate stimulation through play activities can encourage children to think creatively, focus, and persevere in completing tasks. Educational play activities also play a role in

optimizing children's cognitive development through enjoyable learning experiences. Similarly, Slamet (2021) explains that activities that are fun mathematically relevant can provide comprehensive stimulation for children's development, including aspects of concentration and emotional regulation. Based on this, optimizing puzzle media in learning is a relevant and potential strategy to help early childhood channel their energy positively, practice self control and reduce the tendency to act impulsively in the school environment. Several previous studies have shown that appropriate stimulation through play activities, fun and thematically relevant activities and teacher's participation in interesting learning activities can help children control their behavior and improve concentration. However, research on the effect of puzzle media in reducing hyperactive behavior is still limited. Therefore, this study aims to explore the effectiveness of puzzles as a stimulation medium in the context of PAUD.

Puzzles media is a learning tool that has educational and therapeutic value for early childhood. Ruqoyah and Nafiqoh (2022) explain that it can puzzle stimulate cognitive abilities through the activity of assembling picture pieces that train concentration eye-hand coordination, and logical problem-solving skills. Andriza and Mahdi (2022) emphasize that playing puzzles also improves focus and perseverance, especially for children who exhibit hyperactive behavior, because children are required to pay attention to details and complete task to completion. This concrete and fun play experiences helps children control behavior, foster self regulation skills, and reduce the tendency to act impulsively. In addition, the use of puzzles supports social development through sharing and cooperation exercises in structured learning situations. Children's cognitive development stages are an important basis for implementing puzzle media. According to Piaget in Fatimah (2015), children aged 2-7 years are in the praoperational stage, where they learn through concrete activities such as play activities that involve imagination and interaction with their surroundings. At this stage, children tend to think symbolically but are still limited to concrete logic. Therefore, activities that require focus, perseverance, and self-regulation are highly relevant. Nunzairina et al.(2021) emphasize that through puzzle activities, children are encouraged to be more patient, focused, and able to complete tasks gradually. The activity of assembling images into a whole not only stimulates cognitive abilities but also trains self-control and perseverance, which are important skills in dealing with hyperactive behavior. Thus, the application of puzzle aligns with Piaget's the principle of children's cognitive development and is an effective strategy to support the control of hyperactive behavior in the learning environment.

Hyperactive behavior in early childhood is one of the main challenges in the learning process. According to Siregar (2022), hyperactive children show difficulty in controlling themselves, are easily distracted, move from activity to activity without completing it, and tend to act impulsively or show spontaneous aggressiveness. Abidin (2023) added that factors causing hyperactive behavior include lack of parental attention, insufficient stimulation and supervision, and expressive orientation toward pleasure. In addition, Clarke et al. (2019) stated that hyperactive behavior can be a symptom of a neurodevelopmental disorder, known as Attention Deficit Hyperactivity Disorder (ADHD), so appropriate intervention strategies are needed so that children can channel their energy positively. Understanding hyperactive behavior is important for teachers in designing learning activities that channel children's energy constructively. Based on theoretical knowledge regarding the cause and characteristics of hyperactivity the use of puzzle media as an educational and therapeutic tool is expected to help children control their behavior foster self-regulation and reduce the tendency to act impulsively gradually.

According to Latif et al. (2024), the behaviorist approach provides a foundation for understanding how young children, including those with ADHD, can be guided to control their behavior through structured learning experiences with positive reinforcement and repeated practice so that adaptive behavior strengthened while maladaptive behavior is minimized. This approach is relevant in the application of puzzle media, because children receive self-regulation stimulation as well as consistent guidance and feedback from teachers, so that desired behavior is formed through repetition and reinforcement. Hurlock (1978 in the UMS FKIP Team 2025) emphasized the importance of fun directed play activities to form positive habits improve children's self-regulation. Thus combination of behaviorist principles with puzzles media enables children to manage energy, improve concentration, reduce impulsive behavior and stimulate cognitive, social, emotional development and behavioral control, especially to children who show symptom of hyperactivity.

Although various theories discuss the benefits of puzzle media children's cognitive development and the characteristics of hyperactive behavior, there are gaps that need to be addressed. Some theories emphasize the function of puzzle in cognitive stimulation or the development of social skills in general, but do not specifically discuss optimizing puzzles to reduce hyperactive behavior in early childhood. Furthermore, existing theories rarely integrate the concepts of self-control, emotional regulation, and educational intervention through puzzle media simultaneously. This indicates the need for targeted approach, combining the principles of cognitive development, learning theory, and the characteristics of hyperactive behavior to create effective learning strategies. Therefore, this study is expected to fill this theoretical gap by exploring the use of puzzle media as an educational and therapeutic tool that positively channels children's energy, improves concentration, reduce impulsive behavior. This gap theory serves as a theoretical foundation that strengthens the research's objective and its relevance to the phenomenon of hyperactive behavior in early childhood education institutions.

Several previous studies have shown that educational games, particularly puzzle play a significant role in reducing hyperactive behavior in early childhood. Widyasari et al. (2025) explained that meta cognition based interactive game help children develop the ability to think and act in a directed manner while simultaneously recognizing and controlling their own behavior. Furthermore, Research by Zulkarnain & Nirwana (2025) developed digital puzzle based learning media that has been proven to significantly improve children's language skills and boost learning motivation. These findings

emphasize the importance of play activities as an active learning. Tool that not only hones meta cognition and focus but also plays a role in reducing hyperactive behavior. Thus, puzzles are an effective strategy for improving self regulation and cognitive skills early childhood. Research conducted by Winarsunu et al. (2022) shows that puzzles playing activities can be an effective strategy to improve self regulation skills in children including children with Attention Deficit Hyperactivity Disorder (ADHD). Through puzzles making activities, children are trained to focus, be diligent and complete tasks up to until it's finished. This activity also stimulates attention and self control skills so that it can help reduce impulsive and hyperactive behavior during the learning process. The study emphasized of companions, such as teachers or parents, in providing direction and support when children play puzzles. In addition, Ratri et al. (2023) from an international perspective developed the Borneo Puzzle Game media based on educational games for children in special schools. The results of the study showed an increase in self regulation skills in hyperactive children, In addition, variations in the type of puzzle also have an effect on increasing children's focus. Thus, media has been proven to support.

Mulyani and Abdillah (2023) explain that managing children with Attention Deficit Hyperactivity Disorder (ADHD) requires not only a behavioral control approach but also prioritizing learning activities that can improve children's focus and attention. Play based activities have been shown to provide positive stimulation for children to develop concentration and self control skills. In this study, the active involvement of teachers in guiding children through play activities is an important factor contributing to the success of managing hyperactive behavior. This finding is in line with the result of research by Rosida et al. (2023) which show that the role of teachers need to provide an interactive and flexible learning atmosphere so that children are easier to direct without feeling stressed in this context, the use of play media such as puzzles can be an effective learning alternative to optimize focus train patience, and channel children's hyperactive behavior into more meaningful activities.

Previous research has shown that educational game based learning media is effective in reducing hyperactive behavior while improving children's self regulation skills. Paputungan et al. (2025) found that puzzle games can reduce impulsive behavior in children aged 5-6 years through a pretest post test experiment. Children become more focused, patient, and able to control their actions while playing. This finding confirms that puzzles not only increase creativity but also function as a means of behavioral therapy. In line with this, Masrum et al. (2023) reported that educational game based learning, such as guessing games, can improve the concentration of children with ADHD, making them more focused and directed and focused during learning activities, and better able to control impulsive behavior. Based on these two studies, it appears that optimizing puzzle media can be applied in early childhood learning to help them manage their behavior and improve their overall focus skills. Research on puzzles media in children's learning is often conducted to improve concentration cognitive abilities, and executive functions. Zahroh et al. (2024) found that playing puzzles can help children with ADHD improve focus showing therapeutic potential in helping attention disorders in line with that Charifa and Apriliani (2025) stated that strategy games including puzzles and cards, support the studies emphasize increasing concentration and executive functions, not directly reducing hyperactive behavior.

Although many studies emphasize the benefits of puzzles media in early childhood learning, there are gaps that need to be addressed. Most studies focus on cognitive aspect or general child skills without emphasizing the use of puzzles to reduce hyperactivity behavior. Some studies are also limited to children with normal learning abilities, so they have not evaluated their impact on cognitive on children with hyperactivity symptoms or ADHD. This indicates the need for research that integrates theories of cognitive development, hyperactive behavior, and the principles of directed learning.This study aims to optimize the use of puzzles as an educational and therapeutic tool, capable of channeling children's energy positively increasing concentration and reducing impulsive behavior. This gap serves as a theoretical and practical basis for the study. While also strengthening the justification that although puzzles have been widely used, there has been no study specifically assessing the of optimization of puzzles two address hyperactive behavior in early childhood. Therefore, this study is expected to provide new contributions to learning practices and effective intervention strategies for hyperactive children in early childhood education institutions.

Research methods

This study used a qualitative a descriptive approach (case study) to describe in dept the influence phenomenon of hyperactive behavior of one child initial's D in dept, including the child's response to the use of puzzles in daily learning activities Fateqah & Nuswardani (2024); Creswell & Poth (2018; in Dewi, 2020). The object of the study is the use of puzzle media as a learning tool to reduce hyperactive behavior in early childhood. This type of descriptive research allows for systematic and objective observation of changes in child behavior, so that changes in child behavior can be observed in detail and presented in narratives. This approach allows researchers to interpret children's responses, interactions, and self control as a whole, without manipulation or experimentation. The research was conducted at BA Aisyiyah VII Grogol with considerations of ease of observation and the relevance of the subjects to the research objectives. The research lasted for three months from early February to the and April 2025 with puzzle sessions conducted twice a week, each session lasting 5-20 minutes. The research subjects were selected using purposive sampling, including child D (group A) who showed hyperactive behavior, class teachers who observed the child's behavior, and parents who provided additional information at home so that the data reflected two child environments (Sugiyono,2020;Creswell&Creswell,2018).

The research data comes from primary and secondary sources. Primary sources were obtained from observations of children's behavior while playing puzzles, interviews, with teachers and parents, and documentation o activities,

including children's responses before, during and after playing, including focus, self control, and impulsive behavior (Creswell&Creswell 2018 ; Moleong,2014). Secondary sources include child development records, daily journals, child profiles, photo documentation, and previous research results. Data collection was carried out through direct observation, interviews semi-structure, and documentation, so as to provide a comprehensive and contextual picture of the influence of puzzles on children's hyperactive behavior. The research instruments include observation sheets, semi-structured interview guidelines, photo documentation and hyperactive behavior frequency questionnaire (Siregar, Fatimah 2015). Validity is maintained through triangulation of check sources and continuous observation (Creswell&Creswell 2018) while data analysis uses the Miles & Huberman (1994) model through three stages of data reduction, data presentation, conclusion drawing and verification to ensure objective and accurate findings regarding the effectiveness of puzzle media in reducing children's hyperactive behavior.

Research Results and Discussion

Changes in Child D's Focus

Before the intervention, Child D showed significant difficulty focusing. He often moved aimlessly, was easily distracted by surrounding stimuli, and tended not to complete activities that had been tarted. During the research process, the child was given the opportunity to play puzzles twice a week for three months. Based on observation there were gradual behavioral changes, particularly in the ability to focus and maintain attention during the activity. The teachers reported that child' D, began to show positive changes in his ability to focus during the activity. The teachers reported that child D, began to show positive changes in his ability to focus during the activity. At the beginning of the intervention, the child was only able to complete part to the puzzle with teacher guidance. However, over time the child became more easily directed, able to sit still, and was able to complete the puzzle independently. Interviews with the teacher also confirmed that the child was increasingly able to pay attention to instructions and maintain engagement in the activity. Parents also reported improved focus when the child played puzzles at home, especially who the activity was structured. Repeated observations over three months showed consistent improvement : in the first month the child was able to focus for 5-10 minutes increasing to 10-15 minutes in the second month, and reaching around 20 minutes in the third month. These findings indicate that puzzle media is effective in helping to improve the concentration and perseverance skills of early childhood.

Figure 1. Child D focuses independently assembling a puzzle

As shown in Figure1, Child D is seen playing with puzzles independently and arranging the pieces with a high level of concentration. This structured activity provides opportunity for children to practice focus and impulse control as wll as regulate their behavior during the activity. Latif et al. (2024) emphasized that behavior modification strategies involving challenging but purposeful tasks can help children with impulsive tendencies-including those exhibiting ADHD like symptoms to increase self control and complete activities gradually.

Sudden Reduction in Hitting Behavior

Before the intervention, Child D often hit friends suddenly with an average frequency of three times per day. After the implementation of the puzzle playing activity the frequency of hitting behavior decreased significantly. In the firs month the frequency remained three times per day, but began to decrease to once per day in the second month, and in the third month the hitting behavior no longer appeared. Observations and photo documentation of activities reinforced this finding. Teachers noted that the child was more patient, to restrain impulses, and began to control his emotions. Parent also reported that the child was calmer at home. These findings supports the Behaviorist learning theory as well as research by Siregar (2022) and Abidin (2023) which explains that structured activities that require focus can being reduce hyperactive and impulsive behavior in early childhood.

Figure 2, Child D playing puzzles with friend of the same age

As shown in Figure 2, Child D plays puzzles with peers in a condusive atmosphere. This activity provides an opportunity for the child to channel energy positively, reduce the impulse to hit, and simultaneously practice social skills such as sharing, cooperation, and self=control when working in a small group.

Ability to Cooperate with Friends

In addition to a decrease in hitting behavior, child D's ability to cooperate with friends also showed positive development. Initially, the child tended to play alone, had difficulty sharing and was less able to interact in a directed manner. However, through puzzle activities with peers the child began to learn to take turns, help friend put together puzzle pieces, and interact more positively. The teacher observe that the child was increasing cooperative, following the rules of the game, asking question, and providing assistance when playing. His friend are having difficulties. Parent also reported that this cooperative behavior is seen at home, for example, the child is more patient when playing with his siblings. Photo documentation and teacher diaries show that the child are beginning to show initiative medium for stimulating social and cooperative skills in early childhood, as children begin to ask for help from friends when they encounter difficulties and provide early childhood, as children begin to ask for help from friends friends when they encounter difficulties and provide assistance to other friends.

Figure 3, Child D plays puzzle with teacher supervision in class

As seen in Figure 3, the teacher accompanies the child D during the puzzle activity by providing direction and praise when the child successfully completes a certain part. The teacher's assistance helps the child maintain concentration, reduces impulsive behavior, and practice social skills through direct interaction in structured activities. This finding is in accordance with Hurlock's (1978) theory of social emotional development which emphasizes the importance of peer interaction and adult support in shaping children;s self-control and social skills. Puzzles activities provide a safe and fun learning context for developing cooperation.

Teacher and Parent Perceptions

Interview data with teachers showed that the use puzzle had a positive impact on children's orderliness and focus in the classroom. Teachers observed that children found it easier to follow instructions showed increased concentration, decreased hitting behavior , and were more patient and calm in completing tasks. Parents also reported similar changes at

home , with children becoming calmer during play, better able to complete activities independently, and more cooperative in family activities. Data triangulation between observations, interviews, and documentation shows that puzzles provide balanced cognitive and social stimulation, so that children's hyperactive behavior in consistently reduced. Cross environmental findings both at school and at home indicate that puzzle media has stable and reliable affective, in accordance with the principle of source triangulation according to Miles and Huberman (1994).

Discussion

Overall, this study optimizing puzzle media can gradually reduce hyperactive behavior in children. Puzzle activities act as stimulation that requires children to focus, complete tasks, control impulses, and practice patience. Consistent observation, supported by visual documentation and interviews with teachers and parents, strengthen the validity of the data and provide a comprehensive picture of changes in the children's behavior. The findings align with research by Latif et al. (2024) which emphasize the importance of reinforcing positive behavior through repeated experience from a behaviorist perspective, where children receive consistent guidance and feedback to foster adaptive behaviors. The result of the study also support the principles of social emotional development according to Hurlock's (1978) which emphasizes the importance of interaction in habituation in children's learning environment. Furthermore, this study strengthens the findings of research Siregar (2022) and Abidin (2023) which show that activities that train focus and active engagement can reduce impulsive behavior in hyperactive children. Simple interventions such as puzzles have been shown to not only improve focus but also encourage self control, cooperation, and patience. Providing routine intervention twice a week for three months children to internalize these skills. So that previously frequent hitting behavior gradually disappears. Thus, this study provides practical implications that puzzle media can be an effective, fun and educational strategy for reducing hyperactive behavior in early childhood.

Closing

Conclusion

Based on the research results, it can be concluded that optimizing puzzles is an effective learning strategy to reduce hyperactive behavior in early childhood in a gradual and enjoyable way. Puzzle playing activities have been proven to improve children's focus, patience, self control, and social skills through a learning process that involves repeated experiences and directed interactions. Observations from teachers and parents show consistent behavioral changes, where children become calmer, more cooperative, and able to control impulses both at school and at home. This finding is in line with Behaviorist theory, which emphasizes the reinforcement of positive behavior through repetition, as well as the theory of social emotional development which emphasizes the role of social interaction in shaping adaptive behavior. Thus, puzzle media can be used as an alternative effective learning strategy educational and structured to help early childhood develop cognitive abilities while reducing hyperactive behavior as a whole.

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