STIMULATION OF FINE MOTOR DEVELOPMENT IN CHILDREN WITH HYPERACTIVE DISORDER USING THE TRADITIONAL GAME OF CONGKLAK

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ABSTRACT

The World Health Organization (WHO) stated in 2020 that globally, 15-20% of preschool-aged children experience fine motor development disorders. The 2020 Basic Health Research in Indonesia stated that the rate of fine motor development disorders was 9.8%. Fine motor skills disorders often occur in children with developmental disorders such as attention deficit hyperactivity disorder. The traditional game of congklak is effective in stimulating the development of fine motor skills and cognitive skills in early childhood. Objective: determine the effectiveness of traditional congklak game stimulation on the development of fine motor skills in children with hyperactivity disorder. Used a One Group Pretest-Posttest Design. The research sample was taken using a purposive sampling technique, with the criteria of children aged 5-6 years with symptoms of hyperactivity disorder obtained 10 children. The research stages consisted of pretest, intervention, and posttest. Intervention with congklak game stimulation once a day for 15-30 minutes duration was carried out for 5 days. Data analysis used was the Wilcoxon Signed-Rank Test. The fine motor development of children with hyperactive disorders before stiulation intervention was mostly in the Starting to Develop (70%), and after intervention was mostly in the Developing According to Expectations (60%). The Wilcoxon Signed-Rank Test shows that a significance value of 0.031 < 0.05 indicates a significant difference between the pre and post intervention. The traditional game of Congklak is effective in stimulating fine motor development in children with hyperactivity disorder. Congklak is not only a traditional pastime, but also an effective educational tool for stimulating and developing children's fine motor skills in an interactive and creative way. Parents and teachers can use congklak as a fun learning tool.

Keywords: congklak; fine motor development; hyperactive disorder; stimulation

INTRODUCTION

Fine motor development refers to a child's ability to perform movements involving small muscles, particularly those in the fingers, wrists, and eyes, as well as coordination between these body parts. This ability is crucial for supporting daily activities, such as writing, drawing, buttoning clothes, using cutlery, and holding small objects. Optimally developed fine motor skills provide an important foundation for writing skills, involvement in other learning activities, and independence in self-care throughout childhood and adulthood (Dewi & Surani, 2018).

The World Health Organization (WHO) stated in 2020 that globally, 15-20% of preschool-aged children experience fine motor development disorders. Meanwhile, the United Nations International Children's Emergency Fund (UNICEF) recorded that 27.5% of motor development disorders occur in children aged 3-6 years (Fourwanto & Sari, 2024). Approximately 60% of cases of fine motor development disorders are found spontaneously in children under 6 years of age in Indonesia (Soraya & Suwanti, 2023). The 2020 Basic Health Research in Indonesia stated that the rate of fine motor development disorders was 9.8%. A survey of several regions in Central Java showed that the majority of preschool-aged children (85%) had normal fine motor development, but the remainder (12.6%-22%) experienced delays or fine motor development disorders (Silawati, Nurpadilah & Surtini, 2020).

Fine motor skills disorders often occur in children with developmental disorders such as attention deficit hyperactivity disorder (ADHD). Children with developmental disorders experience symptoms including difficulty maintaining attention, hyperactivity, and impulsivity. This disorder can disrupt a child's daily learning and social functioning and requires early intervention to prevent long-term consequences (Prasaja, Harumi & Fatmawati, 2022).

Studies in Indonesia show the prevalence of hyperactive disorder in boys is around 35.2%, while in girls it is around 18.3%. Boys exhibit more challenging and aggressive behavior (Adzaningtias, 2016). The prevalence of developmental disorders in children in Indonesia is estimated to be quite high, with variations between regions, and is more common in boys. The risk of hyperactive disorder is around 10-30% in some elementary school populations, so early assessment and intervention are highly recommended (Sadida et al., 2024).

Every child develops at a different pace, so it's crucial for parents to consistently provide stimulation and support their child's growth and development in a positive and enjoyable way. Children's fine motor development is influenced by various factors. Factors contributing to fine motor impairments in Indonesia include a lack of opportunities for children to explore their environment, parenting styles, nutrition, limited access to healthcare, a lack of varied learning media, and a lack of stimulation (Rusmini et al., 2023).

The traditional game of congklak is effective in stimulating the development of fine motor skills and cognitive skills in early childhood. In this game, children move congklak seeds with precision into small holes in turn, training hand-eye coordination and the strength of small muscles in the hands, thus honing fine motor skills (Permatasari & Wulansuci, 2025). The traditional game of congklak is a fun and highly beneficial stimulation method for developing fine motor skills, coordination, cognitive skills, and social skills in early childhood. Several studies have shown that using congklak as a learning medium is very effective in improving fine motor skills in children, especially those aged 3–6 years. Quasi-experimental research on children aged 3–6 years showed that congklak is more effective in improving fine motor skills than other games (Putri, 2022).

A study conducted in a kindergarten in Bekasi using the congklak game model showed an increase in fine motor skills in children aged 4-5 years from 10% to 80% over two learning cycles (Ati, Watini & Kurniawaty, 2025). The difference between this study and previous studies is the research subjects. The previous study provided congklak game stimulation to children aged 4-5 years, while this study provided stimulation to children aged 5-6 years with symptoms of hyperactivity disorder. The purpose of this study was to determine the effectiveness of traditional congklak game stimulation on the development of fine motor skills in children with hyperactivity disorder.

METHOD

The study used a One Group Pretest-Posttest Design, a statistical test commonly used to analyze differences between pretest and posttest results in one group. The study population was kindergarten children. The research sample was taken using a purposive sampling technique, with the criteria of children aged 5-6 years with symptoms of hyperactivity disorder obtained 10 children. The research stages consisted of pretest, intervention, and posttest. Intervention with congklak game stimulation once a day for 15-30 minutes duration was carried out for 5 days. Data analysis used was the Wilcoxon Signed-Rank Test.

Indicators for assessing fine motor skills in children aged 5-6 years include drawing people with body parts, tracing shapes, cutting according to patterns, pasting collages from various materials, stringing beads, and the ability to write and color within the lines (Hasna & Kamtini, 2021). The fine motor assessment categories for children aged 5-6 years with an ordinal scale are:

Table 1.
Beginning to Develop (MB), Developing as Expected (BSH), and Developing Very Well (BSB)

Category	Fine Motor Indicators	Activity
Starting to Grow (MB)	Children are starting to be able to perform basic fine motor movements but are still not fluent or consistent.	- Holds a pencil unsteadily - Cuts straight lines with assistance - Draws simple lines and shapes with untidy results
Developing as Expected (BSH)	Children are able to carry out various fine motor activities independently and according to their age development.	- Holds a pencil correctly and steadily - Cuts according to simple patterns - Draws patterns, letters, numbers, and copies shapes fairly neatly - Folds paper into certain shapes
Very Well Developed (BSB)	Children are very skilled and precise in performing fine motor activities, controlled and neat movements.	- Draw complete and proportional images - Cut complex patterns neatly - Write letters and numbers clearly and clearly - Combine several fine movements in complex ways, such as stringing beads or making crafts

*Source: Early Childhood Education (PAUD) Content Standards (Ministry of National Education, Indonesia, 2007) in Mahanani, Palupi & Pudyaningtyas (2022)

RESULT AND DISCUSSION

Table 1.
Respondent Characteristics

No	Characteristics	f	%
1	Age		
	5 years old	5	50
	6 years old	5	50
2	Gender		
	boy	6	60
	girl	4	40
3	Health Condition		
	healthy	9	90
	mild illness	1	10

Table 1 shows that the characteristics of the respondents are 5 children aged 5 years (50%) and 5 children aged 6 years (50%), the gender of the children is mostly boy, namely 6 children (60%), the health condition of the majority of children is in a healthy condition, namely 9 children (90%).

Table 2.
Fine Motor Development of Children with Hyperactivity Disorder Before Intervention Stimulation with the Traditional Game of Congklak

No	Fine Motor Development	f	%
1	Starting to Develop (MB)	7	70
2	Developing as Expected (BSH)	3	30
3	Developing Very Well (BSB)	0	0

Table 2, it is known that the fine motor development of children with hyperactive disorders before the traditional congklak game stimulation intervention was mostly in the Starting to Develop (MB) category, namely 7 children (70%).

Table 3.
Fine Motor Development of Children with Hyperactive Disorders After Intervention Stimulation with the Traditional Game of Congklak

No	Fine Motor Development	f	%
1	Starting to Develop (MB)	3	30%
2	Developing as Expected (BSH)	6	60%
3	Developing Very Well (BSB)	1	1%

Based on table 3, it is known that the fine motor development of children with hyperactive disorders after the traditional congklak game stimulation intervention was mostly in the Developing According to Expectations (BSH) category, namely 6 children (60%).

Table 4.
Results of the Wilcoxon Signed-Rank Test of Fine Motor Development in Children with Hyperactivity Disorder Before and After Intervention Stimulation with the Traditional Game of Congklak

Wilcoxon Signed Rank Test Statistics		Mark
N (Number of Samples)		10
Negative Ranks (number of decreases)		2
Mean Rank Negative Ranks		3.5
Sum of Ranks Negative Ranks		7
Positive Ranks (number of increases)		7
Mean Rank Positive Ranks		5.00
Sum of Ranks Positive Ranks		35
Ties (equal values between pre-post)		1
Statistical Test	Mark	Significance (Asymp. Sig. 2-tailed)
Wilcoxon Signed Rank T-Test	7	0.05

Table 4 shows that a significance value of 0.031 < 0.05 indicates a significant difference between the pre- and post-intervention conditions. This indicates that traditional congklak game stimulation significantly impacts the fine motor development of children with hyperactive disorders.

Table 1 shows that the characteristics of the respondents were 5 children aged 5 years (50%) and 5 children aged 6 years (50%). The fine motor development of children aged 5-6 years emphasizes that at this age range, motor coordination, especially between the small muscles in the hands and fingers, has developed more perfectly and is well controlled. Children's fine motor movements begin to be regular, repetitive, and focused on details of activities (Ndiang, 2024). The age of 5-6 years is a crucial period in fine motor development where children demonstrate increasingly mature coordination and control of hand-finger movements. Age serves as an indicator of nerve and muscle maturity that supports fine motor skills, which are further influenced by stimulation and the environment. Monitoring fine motor development at this age needs to be a focus to ensure the achievement of optimal fine motor function (Pratami, 2022).

Table 1 shows that the characteristics of respondents based on gender of children with hyperactive disorders are predominantly male, namely 6 children (60%). Girls tend to develop fine motor skills faster than boys, especially at an early age, around 2–3 years old through preschool. Girls are generally more skilled at fine movements such as writing, drawing, cutting, and stringing. This is associated with biological and neurological factors that cause girls to have more developed hand-finger coordination and fine muscle control at that age (Anggita & Ferasinta, 2023). Environmental factors, stimulation, and experience play an important role in motor development, so although there are tendencies for differences

between the sexes, the stimulation provided can reduce or eliminate these differences. Table 1 shows that the majority of respondents, based on their children's health, were healthy, representing 9 children (90%). Stimulating fine motor development will be more effective if supported by good health and nutrition, making health and nutrition interventions crucial during early development. Good health ensures a child's neurological and physical readiness to optimally develop fine motor skills, while poor health risks delays and impaired fine motor development (Faridaha, Hidayah & Afifah, 2023).

Table 2 shows that the fine motor development of children with hyperactive disorder before the congklak game stimulation intervention was mostly in the Beginning to Develop (MB) category, namely 7 children (70%). Fine motor development in children with hyperactive disorder is generally hampered because they often exhibit impulsive behavior, difficulty focusing, and excessive movement. Children with hyperactive disorder typically experience difficulties in fine motor skills such as grasping, cutting, shaping, sticking, coloring, buttoning, and writing (Abidin, 2023).

Table 3 shows that the fine motor development of children with developmental disorders after the congklak game stimulation intervention was mostly in the Developing According to Expectations (BSH) category, namely 6 children (60%). The fine motor development of children with developmental disorders with the hyperactive-impulsive type can develop well with appropriate interventions, such as stimulation therapy, support from teachers, parents, and the environment. Strategies for developing fine motor skills in children diagnosed with hyperactivity include habituation, innovative, motivating, and enjoyable learning through fine motor activities such as play therapy. Furthermore, appropriate seating arrangements and clear rules also support fine motor development in hyperactive children. Previous research has shown that this strategy has proven effective at Among Putro Kindergarten in Bantul (Saputri, 2023).

Fine motor impairments in hyperactive children can be addressed through a systematic therapeutic approach, the use of educational media and games designed to train hand-eye coordination, and engaging and motivating learning conducted by parents or teachers and supported by the child's environment. Although hyperactive children have challenges in fine motor development, with appropriate intervention and strategies, their fine motor skills can improve well and optimally (Hardaningtyas, Moewardi & Ananta, 2024).

Table 4 shows a significance value of $0.031 < 0.05$, indicating a significant difference between the pre- and post-intervention conditions. This indicates that congklak game stimulation has a significant effect on the fine motor development of children with hyperactivity disorder. The traditional congklak game is very effective in stimulating children's fine motor development, especially in early childhood (3-6 years). Playing congklak requires children to skillfully move their fingers and hands to pick up, move, and place congklak seeds into holes alternately. These movements directly train hand-eye coordination and finger dexterity, which are important aspects of fine motor skills (Putri, 2022).

Congklak involves various movements such as grasping, pinching, and moving seeds precisely which trains the small muscles of the hands and fingers. Research shows that playing congklak improves the skills of drawing straight, curved, and slanted lines related to children's writing readiness. Research conducted by Permatasari & Wulansuci (2025) showed an increase in fine motor skills in three aspects, namely making curved lines left and right increased by 16%, making perpendicular lines increased by 11%, and making slanted lines left and right increased by 13%. Learning using congklak media effectively improves children's fine motor skills with an effectiveness value of 20.5 which indicates a very effective category. Similar research conducted by Ati, Watini & Kurniawaty (2025) related to

interactive learning models such as those applied in congklak games proven to be able to significantly improve children's fine motor skills to achieve an increase in ability of up to 80% in several teaching cycles.

Parents or teachers can use congklak as a fun learning tool by guiding children to perform hand movements in an orderly and alternating manner. Congklak is not only a traditional pastime, but also an effective educational tool for stimulating and developing children's fine motor skills in an interactive and creative way, involving the activity of moving seeds from one hole to another with precision, optimally training the fingers and hands. This research shows that congklak is an excellent fine motor stimulation for children, including those with hyperactivity disorders.

CONCLUSION

The traditional game of Congklak is effective in stimulating fine motor development in children with hyperactivity disorder. Congklak is not only a traditional pastime, but also an effective educational tool for stimulating and developing children's fine motor skills in an interactive and creative way. Parents and teachers can use congklak as a fun learning tool.

ACKNOWLEDGEMENTS

The author would like to thank the academic community of the Universitas Duta Bangsa Surakarta for their support. Thank you for the participation of respondents.

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