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THE EFFECTIVENESS OF THE DEVELOPMENT OF GROSS MOTORIC SKILLS AMONG PRESCHOOL CHILDREN BETWEEN PRE AND POST STIMULATION OF TRADITIONAL *ENGKLEK* GAMES

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ABSTRACT

Background: Gross motoric skills are essential abilities during preschool children's development, involving significant body movements such as running, jumping, and maintaining balance. One traditional Indonesian game, called “engklek” or “hopscotch” , is believed to support the development of children's gross motor skills. A lack of gross motor stimulation can negatively impact the child's growth and development. Therefore, it is crucial for parents, teachers, and guardians to ensure children engage in activities that stimulate gross motoric skills. **Method**: This study employed a pre-experimental design, specifically using a one-group pre-test and post-test design. The population consisted of 39 preschool children, with 36 respondents randomly selected through simple random sampling. The instrument used in this study was the traditional game of ”engklek” to collect data, with pre-tests and post-tests conducted to measure the respondents' ability to lift their legs according to their age. Data were analyzed using the Wilcoxon signed-rank test, with significant results ($p < 0.005$).**Results**: The final results showed that stimulation using the traditional “engklek” game positively impacted the gross motor development of preschool children aged 5 to 6 years at Al-Amin Kindergarten in Kediri City. **Discussion**: This study will highlight the importance of paying attention to gross motor stimulation in preschool children, including through traditional games like “engklek”. It will also emphasize the need to monitor children's gross motor development according to their age to ensure optimal progress.

Keywords: Motor Development, Gross Motor Skills, Preschool Children

INTRODUCTION

Motor skills refer to the ability of the nervous system to control motor abilities. One of the important aspects of children's lives is the development of their motor skills, which should be optimal (Sutapa et al., 2021). Generally, gross motor skills develop first, followed by the development of fine motor skills. Gross motor development refers to the development of movement, including balance and

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coordination between extremities, such as crawling, walking, jumping, or running. By the age of 5 to 6 years, children should be able to walk in a straight line and stand on one foot for 11 seconds (Wikaningtyas & Basith, 2022). The success rate of early childhood development not only measures the physical condition and health of children but also assesses their mental, emotional, social well-being, and behavior. Early detection of developmental deviations is crucial to understand that deviations include identifying and addressing any concerns raised by parents regarding their children's development (Pambudi et al., 2023).

All parents undoubtedly wish for their children to grow and develop optimally. A survey conducted by the A survey conducted by the **East Java Provincial Health Office** in East Java Province in 2023 indicated that 53% of children showed normal development for their age, 13% were in a questionable range, and 34% had developmental deviations (Widyantika et al., 2023). This prevalence shows no increase or decrease based on a survey conducted by the Indonesian Pediatric Association in East Java province on 2,634 children aged 0 to 6 years in 2018. The examination results indicated that ten percent of these developmental deviations were related to gross motor deviations, such as difficulties in sitting and walking (Ruauw et al., 2019).

Genetics is the primary factor influencing children's motoric skills. It is important to note that genetic factors are innate and hereditary. Both parents indirectly influence the development of early childhood. According to experts, every baby inherits various characteristics from their parents, including body shape, skin color, intelligence, talents, traits, and even diseases. Pregnancy is the second factor, and it is essential to remember that a child's development begins while the fetus is still in the womb (Juliana, 2022). Children may experience feelings of shame, low self-esteem, jealousy, and social rejection if they lack stimulation to detect their gross motor development from an early age (Fitriani et al., 2019). Therefore, stimulation provided by parents, family members, health cadres, and teachers are crucial for enhancing the gross motor development of preschool children aged 5 to 6 years (Nalle & Margiani, 2022).

An alternative method for early detection and stimulation of preschool children's gross motor skills is through play. Play is an activity that is repeated to

achieve enjoyment (Alfiah & Darsinah, 2023). Play can stimulate children to explore various aspects of development; it also serves as a strong foundation for children to discover solutions to problems in the future. Games for children should enhance language skills, cognitive abilities, physical movement, social-emotional development, religious education, and artistic skills. Both parents at home and teachers at school should be responsible for creating a comfortable and safe environment while providing supervision to ensure children's growth and development are well-stimulated through exploration and play (Hayati & Putro, 2021). Preschool children need physical activities in the form of games that stimulate the use of large muscles, provide opportunities for experimentation, and develop cooperative attitudes (helping each other) with peers through various play facilities. As gross motor skills improve, there are consequences for other areas of development, as motor capacity is linked to other developments in gross motor skill tasks (Wea et al., 2021).

All traditional games are historical heritage that deserves to be preserved so that we can continue to enjoy their benefits (Handayani, 2022). One of the various traditional games assessed to stimulate gross motor skills in preschool children is the traditional game of *engklek or hopscotch*. *Engklek* or *hopscotch* is a game where players jump from one foot to the next square on a flat surface on the ground. Children have a delightful opportunity to explore, discover, express their feelings, create, and learn through this traditional game of *engklek*. This game also trains body movement and agility skills while playing, enhances physical movement, develops communication and strategy skills, and fosters teamwork among children (Herdayanti & Watini, 2021).

METHOD

This study employs a quantitative pre-experimental method using pre-tests and post-tests. This method was chosen to compare the conditions before and after the treatment. Therefore, the objective of this research is to measure the development of gross motor skills in preschool children before and after receiving stimulation through the traditional game of *engklek*, particularly their ability to lift one leg according to their age. The study involves children at The study involves children from a kindergarten in Kediri, East Java Province, aged between 5 and 6

years. The criteria for selecting the sample include the number of children actively participating in learning activities at school, and the samples are selected randomly.

To obtain the desired data, this research uses a structured observation guide. The observation actions are conducted to identify the level of children's gross motor skills before and after the implementation of the traditional game of *engklek*. This process is divided into four phases: (1) Pre-test Implementation, which is used to assess the gross motor skills of children before the treatment is applied. This is conducted one day before the treatment with the traditional game of *engklek*; (2) Teacher and Colleague Briefing. This is done to train teachers and colleagues who will assist the researcher in this study while conducting the traditional game of *engklek*; (3) Treatment Implementation, where the traditional game of *engklek* is conducted four times, once a week, over a four-week period; (4) Post-test Implementation, which is conducted to evaluate the development of gross motor skills through stimulation with the traditional game of *engklek*. This takes place one day after the treatment with the traditional game of *engklek*.

The observation is complemented by pre-test records, which include notes on the children's motor skills in their ability to lift one leg before the treatment, notes on the development of children's abilities while playing the traditional game of *engklek*, and post-test records that contain notes on the children's motor skills in their ability to lift one leg after the treatment. The collected data will first undergo normality testing; if the results do not show a normal distribution, the data will be analyzed using the Wilcoxon matched-pairs test.

Table 1. Observation Instrument for Gross Motor Development: Lifting One Leg According to Age

No	Respondent Name	Age 5 years (seconds)					Age 6 years (seconds)				
		2	3	4	5	6	7	8	9	10	11
		VP	P	F	G	VG	VP	P	F	G	VG
1											
etc											

Explanation :

VP (Very Poor) = If the child can stand for 2 seconds (5 years) and 7 seconds (6 years)

P (Poor) = If the child can stand for 3 seconds (5 years) and 8

seconds (6 years)

F (Fair) = If the child can stand for 4 seconds (5 years) and 9 seconds (6 years)

G (Good) = If the child can stand for 5 seconds (5 years) and 10 seconds (6 years)

VG (Very Good) = If the child can stand for 6 seconds (5 years) and 11 seconds (6 years)

Table 2. Observation Instrument for the Traditional Game of *Engklek*

NO	STATEMENT	OBSERVATION RESULTS			
		NYD	BD	DAE	WD
1	Throwing and placing the *gaco* accurately into a target box				
2	Moving from box to box by hopping on one foot				
3	Hopping from one box to another without stopping using one leg				
4	Standing with a bend on one foot				
5	Jumping while spreading both legs				
6	Jumping with both feet followed by a body turn				

Explanation :

NYD (Not Yet Developed) = score of 1

BD (Beginning to Develop) = score of 2

DAE (Developing as Expected) = score of 3

WD (Well Developed) = score of 4

RESULTS AND DISCUSSION

Results

1 General Characteristics of Respondents

Tabel 3 General Characteristics of Respondents

General Characteristics	Variable	Frequency	Precentage
Age (years)	5	16	44,4 %
	6	20	55,6 %

Gender	Male	16	44,4 %
	Female	20	55,6 %

Source: Primary Data, May 2024

From Table 3, based on age, it can be seen that the majority of respondents are aged 6 years, with 20 respondents. Additionally, based on gender, the majority of respondents are female, also with 20 respondents.

2 Analysis of Gross Motor Development in Preschool Children Aged 5-6 Years Before and After Stimulation with Traditional Engklek Games

The analysis results are shown in the table below:

Table 4 Frequency Distribution of Gross Motor Development in Preschool Children Aged 5-6 Years Before Stimulation with Traditional Engklek Games

General Characteristics	Variable	Frequency	Precentage
Pre-test	Very Good	0	0 %
	Good	12	33,3 %
	Fair	20	55,6 %
	Poor	4	11,1 %
	Very Poor	0	0 %
Total		**36**	**100 %**

Source: Primary Data, May 2024

Based on Table 4, the distribution of gross motor development in preschool children aged 5-6 years before stimulation with traditional Engklek games shows that the majority of respondents fall into the good category regarding their gross motor skills, with 20 respondents (55.6%) categorized as fair, while a small number fall into the poor category, with 4 respondents (11.1%).

Table 5 Frequency Distribution of Children's Development During Stimulation with Traditional Engklek Games.

Variable	Stimulation 1 (%)	Stimulation 2 (%)	Stimulation 3 (%)	Stimulation 4 (%)
Very Good	0	0	75	100
Good	19,5	44,5	25	0
Fair	58,3	47,2	0	0
Poor	22,2	8,3	0	0
Very Poor	0	0	0	0

Source: Primary Data, May 2024

Based on Table 5, the distribution of Engklek play development in preschool children aged 5-6 years shows that at each meeting, the stimulation provided consistently improved. The table indicates that during stimulation 1, the majority of respondents received a fair category result, totaling 21 respondents (58.3%). During stimulation 2, the majority also fell into the fair category with 17 respondents (47.2%). By stimulation 3, the majority achieved good results, totaling 27 respondents (75%), and by stimulation 4, all respondents achieved a very good category, totaling 36 respondents (100%).

Table 6 Frequency Distribution of Gross Motor Development in Preschool Children Aged 5-6 Years After Stimulation with Traditional Engklek Games.

General Characteristics	Variable	Frequency	Precentage
Post-test	Very Good	25	69,4 %
	Good	11	30,6 %
	Fair	0	0 %
	Poor	0	0 %
	Very Poor	0	0 %
Total		**36**	**100 %**

Source: Primary Data, May 2024

Based on Table 6, the frequency distribution of gross motor development in preschool children aged 5-6 years after stimulation with traditional Engklek games shows that the majority of children fell into the very good category regarding their gross motor skills, with 25 respondents (69.4%), and nearly half of the respondents fell into the good category, totaling 11 respondents (30.6%).

Table 7. Statistical Test Results on the Effectiveness of Gross Motor Development in Children

Gross Motor	Mean (SD)	Sum of Ranks	*p-value*
Pretest	0,00	0,00	0,05
Posttest	18,50	666,00	

Based on Table 7, the analysis of gross motor development in children before and after stimulation with traditional Engklek games was conducted using the Wilcoxon signed-rank test. The results showed that the Asymp.Sig (2-tailed) value was 0.000. This means that 0.000 is less than 0.05, so H1 is accepted and H0 is rejected, indicating an improvement in development between pretest and posttest

results. Therefore, traditional Engklek games are considered effective in stimulating the gross motor skills of preschool children aged 5 to 6 years.

Discussion

1. Level of Gross Motor Development in Respondents Before Being Given Stimulation with Traditional Engklek Games

   It is crucial to stimulate gross motor development well from an early age. These motor skills serve as the foundation for achieving other aspects of children's growth and development, such as speaking, language, and social skills. The home environment is the first environment that has a significant influence on child development. Therefore, it is important to provide appropriate stimulation to prevent disruptions in their growth (Larasati et al., 2022). This traditional Engklek game has a positive effect on children's motor skills, aiming to enhance motor cortex speed (Ritonga & Pasaribu, 2022).

   The pre-test results showed that most children aged 5–6 years had not yet reached the expected gross motor development for their age, particularly in the ability to lift one leg while maintaining balance. Specifically, 55.6% of children were categorized as “fair,” and 11.1% as “poor,” indicating limited postural control and leg strength. This suggests that before receiving any stimulation, many children struggled with core stability and neuromuscular coordination, which are essential components of gross motor development. These findings highlight the lack of sufficient physical stimulation and structured motor activities in the children's daily routines prior to the intervention.

2. Level of Gross Motor Development in Respondents After Being Given Stimulation with Traditional Engklek Games

   Playing Engklek has a very positive impact on the development of motor skills in preschool children. This shows that traditional Engklek games have many benefits for early childhood development (Raihana & Sari, 2021). Children’s balance, strength, and flexibility significantly improved after playing Engklek, demonstrating that Engklek effectively helps enhance preschool children's gross motor skills. Furthermore, this game also teaches

emotional regulation skills and social interaction to children (Darmawati & Widyasari, 2022).

After the intervention, the results showed a significant improvement in the children's gross motor skills. For example, the average time preschoolers aged 5 years could lift one leg increased from 3.8 seconds in the pre-test to 5.5 seconds in the post-test. Similarly, 6-year-olds improved from 5.1 seconds to 7.0 seconds. These findings indicate that the traditional *engklek* game, conducted over four weeks, effectively enhanced children's balance and coordination. This improvement suggests that regular engagement in structured physical play can stimulate the development of neuromuscular control and postural stability in early childhood..

3. Analysis of Gross Motor Development in Preschool Children Aged 5-6 Years Before and After Stimulation with Traditional Engklek Games

The importance of providing stimulation for gross motor skills in children during their early school years can be reinforced through traditional Engklek games. The aim is not only to improve their gross motor skills but also to introduce educational elements of the games (Aulia et al., 2023). Children's social-emotional development can also be achieved through traditional Engklek games by introducing game rules, encouraging child interactions, and monitoring development (R. Hayati & Amalia, 2021).

Incorporating traditional games into children's daily activities is a valuable recommendation for teachers and parents. By doing so, it not only improves children's gross motor skills but also contributes to preserving cultural heritage. This study revealed a clear improvement in children's gross motor abilities following stimulation through the traditional *engklek* game. These findings align with those of Raihana & Sari (2021), who reported that *engklek* significantly enhances children's physical motor development. Similarly, Darmawati & Widyasari (2022) emphasized that *engklek* improves balance, coordination, and leg strength in early childhood. The results of this study confirm that even limited sessions (once a week for four weeks) can produce observable developmental progress, especially among children who initially had below-average motor performance. This reinforces the idea that traditional

games serve as effective, culturally relevant tools for stimulating physical development in preschool-aged children.

Conclusion and Recommendation

The development of gross motor skills after stimulation with traditional Engklek games predominantly falls into the very good category. The results of this study indicate that there is an increase in motor skills development among children aged 5 to 6 years, both before and after stimulation with traditional Engklek games, indicating that traditional Engklek games are effective in developing motor skills.

This research is expected to facilitate future researchers in understanding the impact of traditional Engklek games on the development of gross motor skills in preschool children, including comparing the effectiveness of Engklek with other traditional games. For students, the findings from this study serve as a resource for those who want to understand how to develop gross motor skills in preschool children through the use of traditional games like Engklek.

DECLARATION

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Authors' Contribution

All authors contributed equally to the conception, design, data collection, analysis, and writing of the manuscript.

Ethical Approval

This study received ethical approval from the Health Research Ethics Committee of Poltekkes Kemenkes Malang (No.DP.04.03/F.XXI.31/0612/2024), valid from June 14, 2024, to June 14, 2025.

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Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

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