IHYA ULUM
Early Childhood Education Journal
Fakultas Keguruan dan Ilmu Pendidikan Universitas Islam Makassar
E-ISSN 2962-8504

Obstacle Jump Game in Stimulating Gross Motor Skills of Early Childhood

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Abstract

The development of gross motor skills in early childhood currently faces challenges due to an increasing sedentary lifestyle and gadget dependency, which impact the weakening of children's balance and physical coordination. This study aims to analyze the effect of the obstacle jump game on improving the gross motor skills of children aged 5–6 years in kindergarten. The research method used is quantitative with a quasi-experimental design of a pretest-posttest type without a control group. The research sample consisted of 20 children determined through a purposive sampling technique. Gross motor skills were measured through five main indicators, namely the ability to jump without assistance, running and jumping over obstacles, balance upon landing, movement coordination, as well as the children's courage and initiative. The intervention was carried out in a structured manner through six sessions of the obstacle jump game designed adaptively starting from the warming-up phase, gradual introduction of obstacles, to the cooling-down session. The data collection instrument was an observation sheet, while data analysis used the paired sample t-test assisted by SPSS version 23. The analysis results showed a t-value of 18.965 with a significance of 0.000 ($p<0.05$), indicating a significant increase in gross motor skills after the intervention was given. These findings indicate that the obstacle jump game is effective as a method of physical stimulation. This activity supports aspects of courage, body coordination, and children's active involvement in enjoyable physical activities, making it highly feasible to be integrated into early childhood education learning programs.

Keywords: *Early Childhood; Educational Intervention; Gross Motor Skills; Motor Games; Obstacle Jump.*

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Yusran, R., Martuty, A., Syawal, S., Darfin, S.A., Usman, U. (2026). Obstacle Jump Game in Stimulating Gross Motor Skills of Early Childhood. *Ihya Ulum: Early Childhood Education Journal. Vol. 4*(1), 670-684. https://doi.org/10.59638/ihyaulum.v4i1.807

Received 17 December 2025; Revised 30 January 2026; Accepted 26 February 2026; Available online 30 March 2026

INTRODUCTION

Childhood is a crucial period in a child's physical and motor development. Between the ages of 5 and 6, children experience rapid gross motor development, where they begin to master skills such as jumping, running, and balancing. These gross motor skills form an important foundation for children's daily physical activities and support their readiness for the next stage of their education. This phase is a critical one that influences their physical, mental, and social development (Usman et al., 2024). At this age, fine and gross motor skills begin to form and are closely associated with their learning and social interactions. Research shows that improved motor skills are associated with improved executive function and numerical abilities, which further contribute to children's school readiness (Hudson et al., 2020; Hudson & Willoughby, 2021).

Gross motor skills encompass the ability to control large body movements such as walking, running, jumping, and climbing (Usman, Hasmawaty, et al., 2023). These skills not only impact daily physical activity but also influence other aspects of a child's development, such as cognitive, social, and emotional development (Hudson et al., 2020). Research shows that children with strong gross motor skills are more likely to engage in more intense physical activity, which in turn contributes to overall physical fitness and health (Temple et al., 2017).

Appropriate stimulation during this period is crucial. Carefully designed physical activities, including outdoor play involving movement, can enhance children's gross motor development (Usman et al., 2024). Several studies have shown that such play experiences not only improve motor skills but also support social skills and peer interactions (Wainwright et al., 2018). A good educational program that focuses on the development of motor skills can bring long-term benefits to children in terms of physical abilities and social skills, demonstrating a strong relationship between physical activity and a child's overall development (Usman et al., 2025). Therefore, focusing efforts on providing appropriate gross motor stimulation during the early years is crucial to supporting a child's overall development.

Gross motor development in children can be achieved through various fun physical activities, including games specifically designed to improve motor skills. One effective game in this regard is the obstacle course, which involves basic movements such as jumping, running, and climbing. This physical activity is crucial for child development because it strengthens body muscles and improves coordination and balance, which are key components in their gross motor development (Kasanen et al., 2023).

Physical activity incorporated into play in early childhood education environments positively contributes to the development of basic motor skills (Usman, Arismunandar, et al., 2023; Usman, Hasmawaty, et al., 2023). Enjoyable physical activities allow children to learn in a natural and interactive way, building their motor skills while enjoying the process. Further research shows that children's engagement in high-intensity physical activity is also associated with improved overall motor skills (Oh, 2024). Furthermore, games such as obstacle jumps boost children's self-confidence, which is known to have a positive impact on their social-emotional development (Temple et al., 2017).

The development of gross motor skills through play also contributes to cognitive abilities and executive function. Hudson et al. highlighted that improving

motor competence in early childhood correlates with improvements in cognitive skills such as problem-solving and numeracy (Wyver, 2024). This suggests that physical activity is not only beneficial for physical aspects but also enriches children's cognitive development (Masrurah & Khulusinniyah, 2019). Furthermore, the importance of integrating physical exercise with learning to support the development of social and psychological skills (Yoga et al., 2023).

Obstacle jumping, as an active form of play, provides children with opportunities to interact with their surroundings, learn from direct experience, and adapt to physical challenges. Therefore, it is important for educators and parents to provide opportunities for children to engage in this and other forms of active play that can stimulate their holistic motor development (Wainwright et al., 2018). Unfortunately, in recent years, children's physical activity has declined, particularly in urban areas, due to sedentary lifestyles and the dominance of technological devices. Children tend to spend more time sitting, playing with gadgets, and receiving less stimulation for their motor development. This results in decreased muscle strength, coordination, and balance, which are crucial for optimal growth and development.

Based on observations conducted on June 17, 2025 at Taman Paud Doa Ibu Kindergarten, Rappocini District, Makassar City, on 15 children aged 5–6 years (8 boys and 7 girls), it was found that 6 children were not yet able to jump from a height of 30–50 cm and 6 other children were not yet able to run while jumping without falling. This problem is related to aspects of balance, strength, agility, and courage of children who have not developed optimally. In a larger group (30 children), 18 children (60%) showed difficulties in jumping activities, such as lack of agility, improper technique, and still needing teacher assistance. Meanwhile, the school yard which could actually be used for physical activities has not been used optimally, teachers more often direct play activities in the classroom and do not observe children's motor activities outside the room. Efforts that have been made by teachers include group exercise every Friday and motor activities such as walking in a straight line, tiptoeing, crawling, and jumping from a height. However, many children have not achieved optimal development. Therefore, researchers implemented the game *obstacle jump* to train students' gross motor skills, the obstacle jump game has never been implemented at Taman Paud Doa Ibu Kindergarten.

Kindergarten, as an early childhood education institution, plays a strategic role in providing enjoyable and rewarding learning experiences, including through physical activity. One effective method for stimulating children's gross motor skills is through play. Play provides children with the opportunity to actively move naturally, in a fun and developmentally appropriate way. As an early childhood education institution, Taman Paud Doa Ibu plays a crucial role in developing gross motor skills in children aged 5-6 years through enjoyable learning experiences, particularly physical play. One highly recommended method for this purpose is the obstacle course game. This activity not only stimulates children's gross motor skills but also serves as a tool that supports their social development through group interactions. Physical play, such as obstacle course games, has been shown to improve children's motor skills and self-confidence. Several studies have shown that preschool programs that incorporate appropriate movement activities can enhance children's motor competence and have a long-term positive impact on their physical development (Brian et al., 2018). Children who actively engage in physical activities tend to be more prepared to learn and

have better skills in interacting with their peers. Through play experiences involving physical challenges, children learn about balance, coordination, and body control, all of which are essential components of development, gross motor skills and self-confidence (Morawietz & Muehlbauer, 2021).

Jumping and jumping is a gross motor activity that can develop children's coordination, balance, leg muscle strength, and locomotor skills. In this game, children are challenged to jump over various obstacles with varying levels of difficulty, depending on their abilities. Furthermore, this game also develops children's courage, concentration, and problem-solving skills in dealing with physical obstacles. Obstacle jumping games have benefits for social development. Group activities allow children to interact with each other, learn to share, and cooperate (Sando et al., 2023). This social interaction is crucial in early development because it forms the foundation for more complex social skills later in life. Children's involvement in group physical activities not only improves their motor skills but also encourages psychological development, such as communication and collaboration skills (Kurnia et al., 2024).

A play-oriented approach in early childhood education has been recognized as an effective way to integrate pedagogical theory and practice. Well-designed games, including obstacle course games, not only provide fun but also facilitate in-depth learning and provide opportunities for children to actively engage in their learning (Rand & Morrow, 2021; Sando et al., 2023). By emphasizing the importance of a positive play environment, kindergarten educators can create richer experiences that support children's holistic development (Sollerhed, 2023).

However, there has been little research specifically evaluating the effectiveness of hurdles in early childhood education in Indonesia, particularly in developing gross motor skills. Therefore, this study is important to determine the extent to which hurdles can be an effective stimulation strategy for children aged 5-6 years in kindergarten. This research is expected to provide scientific and practical contributions to the field of early childhood education, as well as serve as a reference for teachers, parents, and related stakeholders in developing educational programs that support the optimal development of children's gross motor skills through a fun and child-centered approach.

METHOD

This study used a quantitative method with a quasi-experimental design to compare the effect of obstacle course games on the gross motor skills of students at Taman PAUD Doa Ibu Kindergarten before and after implementation (Creswell & Creswell, 2017). The research design used pretests and posttests. Sampling was conducted using the purposive sampling (Sugiyono, 2018) so that a sample of 20 people was obtained. To measure the gross motor skills of students, a performance test was conducted where each student carried out activities obstacle jump. Indicators of students' gross motor skills include; (a) the ability to jump from a height of 30-50 cm without assistance, (b) the child's ability to run and jump over obstacles without falling, (c) the child shows balance when landing after jumping from a height, (d) coordination between running and jumping movements in one series, (e) courage and initiative in participating in obstacle jump activities.

The scale for measuring motor skill levels uses an interval scale of 0-100,

the aim being to obtain an objective quantitative picture of a child's motor development achievements. This scale allows educators or researchers to assess skill levels progressively across various values, allowing for detailed differentiation between individuals. With an interval scale, each value has the same distance and can be calculated mathematically, allowing for the use of statistical analysis such as averages, standard deviations, and inferential tests (Saracho, 1984). The Obstacle Jump game activity was carried out six times, where each activity ensured that each child got an equal turn in doing the activity obstacle jump.

Games obstacle jump starting with a preparation stage in the form of a light warm-up to activate the child's body muscles and prevent injury when doing physical activities. (a) the teacher gives a brief explanation of the purpose of the game, namely to train balance, coordination, and leg muscle strength, (b) the teacher also demonstrates the correct and safe way to jump, such as keeping one's gaze forward, bending the knees before jumping, and landing with both feet simultaneously in a balanced position, (c) children are introduced to the obstacles they will face in the game, (d) these obstacles are arranged in stages, starting from low to higher, such as mats, small blocks, or jumping poles 30–50 cm high, (e) children are invited to try the obstacles one by one in stages, starting from the lowest level of difficulty according to their respective abilities.

Children try to pass through obstacles, the teacher provides guidance to ensure safety and provides positive encouragement so that children feel confident, (f) after children get used to it, they will face a series of more challenging obstacles, such as jumping while running without losing balance. The teacher continues to provide positive feedback in the form of praise, applause, or verbal appreciation to increase children's motivation and courage, (g) the activity is closed with a cool down through light movements and simple stretching. The teacher can invite children to sit in a circle, reflect on the activity, and provide an opportunity for children to share experiences during play Obstacle Jump. Data was collected using an observation sheet and then analyzed statistically parametric inferential comparative paired sample t-test with the help of SPSS IBM 23 (Hasmawaty et al., 2023).

RESULTS AND DISCUSSION

The results of descriptive data analysis of obstacle jump games for children aged 5-6 years in stimulating children's gross motor skills in kindergarten. Descriptive data on children's gross motor skills with indicators; a) the ability to jump from a height of 30-50 cm without assistance, (b) the child's ability to run and jump over obstacles without falling, (c) Children show balance when landing after jumping from a height, (d) coordination between running and jumping movements in one series, (e) courage and initiative in participating in obstacle jump activities.

Table 1. Descriptive Data of Pretest and Posttest of Gross Motor Skills of Students

Descriptive Statistics	*Pretest*	*The post office*
N	20	20
Mean	50.7500	85.3500
Std. Error of Mean	1.48124	1.64361

Descriptive Statistics	*Pretest*	*The post office*
Median	51.0000	87.0000
Mode	40.00[a]	80.00[a]
Std. Deviation	6.62432	7.35044
Variance	43.882	54.029
Skewness	-.224	-.898
Std. Error of Skewness	.512	.512
Kurtosis	-.845	.712
Std. Error of Kurtosis	.992	.992
Range	21.00	30.00
Minimum	40.00	67.00
Maximum	61.00	97.00
Sum	1015.00	1707.00

Based on Table 1, which shows descriptive data from the pretest and posttest of children's gross motor skills. In the pretest involving 20 children, the average score (*mean*) is 50.75, with a range of values between 40 and 61. The pretest standard deviation was 6.62, indicating considerable variation in the scores obtained. The mean score was lower than the post-test score, indicating that the children's gross motor skills at the beginning of the measurement were still quite variable Skewness pretest is -0.224, indicating that the data distribution is slightly skewed to the right, and kurtosis is -0.845, indicating that the data distribution is flatter (less sharp) than the normal distribution.

On posttest, the mean score increased significantly to 85.35, with a range of scores between 67 and 97, indicating an increase in gross motor skills after intervention or training. Standard deviation posttest is 7.35, which is slightly higher than pretest, shows that despite the average increase, there is still variation in the results obtained by children. The tendency towards posttest is -0.898, indicating that the data distribution is more centered on the left side, or in other words, more children obtained high scores. Kurtosis on posttest is 0.712, indicating that the data distribution is more spiky (more centered around the mean) compared to the normal distribution.

Overall, the data showed a significant improvement in children's gross motor skills from pretest the posttest, as seen from the increase in the average and the decrease in the distribution of low scores on posttest. This increase reflects the positive impact of activities designed to develop children's gross motor skills, such as jumping, running, and balance.

Table 2. Data Normality Test.

	Shapiro Wilk			
	Statistic	*df*	*Say.*	*Information*
Pretest	.946	20	.309	Normal
The post office	.937	20	.213	Normal

Table 2 shows the results of the data normality test using the test Shapiro-Wilk for pretest and posttest data. For pretest data, the statistical value Shapiro Wilk is 0.946 with a degree of freedom (df) of 20 and a significance value (Sig.) of 0.309. Since the p-value (0.309) is greater than 0.05, it can be concluded that

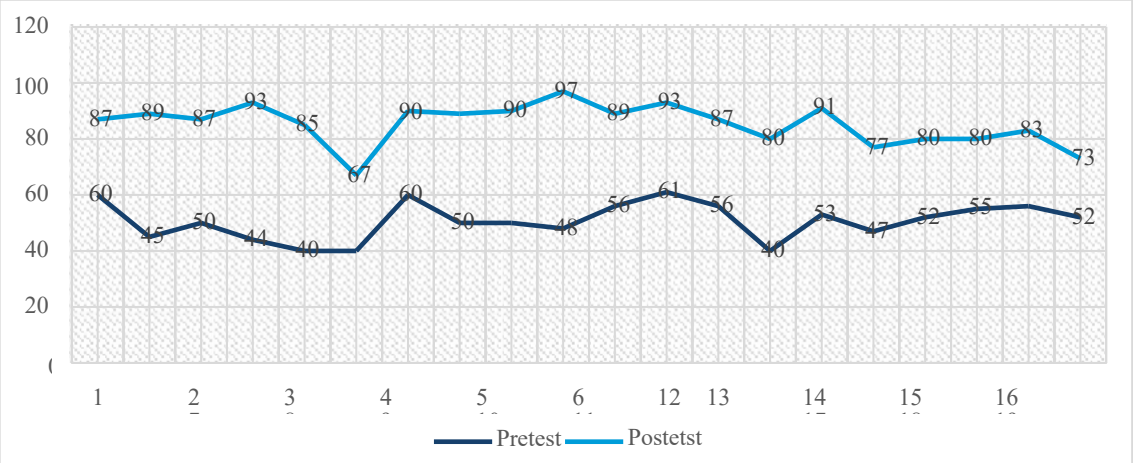
the pretest data is normally distributed. Likewise for the posttest data, with the statistic Shapiro Wilk of 0.937, degrees of freedom 20, and a p-value of 0.213. Because the p-value (0.213) is also greater from 0.05, the posttest data is also normally distributed. Therefore, it can be concluded that both data (pretest and posttest) have a normal distribution based on the results of the normality test Shapiro Wilk.

Table 3. Paired Sample Comparison Test t Test.

	t	*df*	*Sig. (2-tailed)*	*Information*
Post's - Pretest	18.965	19	.000	Significant

Table 3 shows the results of the comparative test using a paired sample t-test to measure differences in children's gross motor skills based on the indicators given, namely the ability to jump from a height, run and jump over obstacles, balance when landing after jumping, coordination of running and jumping movements in one series, and courage and initiative in participating in obstacle jump activities.

The test results show a t-value of 18.965 with a degree of freedom (df) of 19 and a significance value (Sig. 2-tailed) of 0.000. Because the value p-value (0.000) is much smaller than 0.05, it can be concluded that there is a statistically significant difference between the pretest and posttest results. This shows that children's gross motor skills, as measured by these indicators, experienced a significant increase after participating in certain interventions or activities carried out during the testing period. In the children's performance, they showed an increase in their ability to jump from a height without assistance, balance when landing, movement coordination, and courage and initiative in participating in obstacle activities.



Graph 1. Pretest and Posttest Results of Children's Gross Motor Skills

Graph 1 shows the pretest and posttest results of children's gross motor skills children's gross motor skills based on five predetermined indicators. Overall, there was a significant increase between pretest and posttest scores. In indicators (a) the ability to jump from a height of 30–50 cm without assistance, the posttest score was higher than the pretest score, indicating an increase in the children's ability to perform this jump, (b) the ability to run and jump over obstacles without falling, also showed better results in the posttest, with more consistent scores, meaning the children were more skilled at running and jumping over obstacles, (c) balance when landing after jumping from a height, the post-test

scores were more stable and higher, indicating that children were able to maintain their balance better after jumping, (d) coordination between running and jumping movements in one sequence, indicating a significant improvement in children's coordination, which was better in the post-test; courage and initiative in participating in the obstacle jumping activity, children showed higher confidence and were more courageous in participating in this activity in the post-test. Overall, this graph illustrates that the exercises carried out had a positive impact on children's gross motor development, with better post-test results in each indicator.

The development of gross motor skills in kindergarten should be allocated through game-based learning methods, so that children feel comfortable and motivated to participate in these activities (Yuliantini & Melaty, 2023). This approach is in line with research results showing that play activities not only improve motor skills but also stimulate children's social engagement and creativity (Putra et al., 2024). The results of research by Wahyuni & Azizah (2020) found that to develop gross motor skills, activities that can make active and consistent movements that involve large muscles such as jumping, running, moving while maintaining body balance are needed. Other studies add that the use of traditional games such as Bakiak also improves gross motor skills through dynamic social interactions between children in their learning environment. The game of clogs will allow students to move in groups in the game, practice balance, train children to work together in groups, improve coordination between body parts, and develop social skills, such as communication and mutual understanding between group members (Purwanto et al., 2023). The development of children's gross motor activities must be able to involve measured and consistent physical activity.

In the context of children's gross motor development, several studies have shown that fostering physical activity, such as jumping from heights, running and jumping over obstacles, and maintaining balance, is an important area for early childhood learning. This assessment was conducted through two tests (pretest and posttest) on groups of children, with the expectation that the posttest results would show significant improvement. This is supported by studies showing that motor interventions, such as physical education programs, have a positive impact on children's motor development, as well as their creativity and cognitive fitness (Martínez-Merino & Rico-González, 2024; Wu et al., 2024).

Obstacle jumping is a highly beneficial physical activity for children's gross motor development. Indicators such as the ability to jump from a height of 30–50 cm unaided, run and jump over obstacles without falling, and demonstrate balance upon landing after jumping from a height indicate significant physical development. In this game, children are expected to be able to perform jumps without adult supervision or assistance, reflecting their level of independence and confidence in engaging in challenging physical activities (Fadjariyanti & Fathiyah, 2022; Kuswanto et al., 2023). This skill development can be achieved through repeated practice and consistent stimulation, with various studies suggesting that physical activities involving jumping and running can strengthen muscles and improve children's motor skills (Fadjariyanti & Fathiyah, 2022; Kurlillah et al., 2024; Malika et al., 2022).

In the context of obstacle course games, the combined strength of jumping and running movements is crucial, not only for achieving physical success but also for ensuring safety during play. Analysis includes children's ability to run and jump without falling, demonstrating skill in coordinating their body movements

(Darmawati & Widyasari, 2022; Lutfiana et al., 2022). These activities also often involve tests of agility and speed, where children are required to adjust their running speed to execute precise jumps over obstacles. Research suggests that games that facilitate children's running and jumping can have a direct impact on their gross motor development, including muscle strengthening and evaluating good balance upon landing (Fadjariyanti & Fathiyah, 2022; Kurlillah et al., 2024; Malika et al., 2022).

In obstacle course games, children are trained to develop courage, experiment, and take initiative in participating in physical activities, contributing to their social and emotional development, while also increasing their self-confidence in social settings (Asmuddin et al., 2022; Satriawan et al., 2024). Furthermore, the challenges faced in obstacle course games also serve as mental training, where children learn to overcome fears and difficulties. Research shows that children's ability to bravely participate in challenging physical activities not only develops their gross motor skills but also trains their character and mental resilience (Mutiah Siregar, 2023; Yunus et al., 2023).

Structured activities such as obstacle jumps offer numerous benefits that support overall physical growth. By focusing on the aforementioned indicators, children's gross motor skill development can be optimized, in line with physical education principles that promote children's physical and mental health (Iswatiningrum & Sutapa, 2022). Success in these activities requires a holistic approach, grounded in an understanding of child development, encompassing physical, social, and emotional aspects. Educators play a crucial role in providing adequate support and facilities within the context of physical activity (Iswatiningrum & Sutapa, 2022; Satriawan et al., 2024).

When children jumped from a height of 30-50 cm, data showed that posttest scores were higher than pretest scores. This indicates a significant improvement in their motor skills related to jumping ability. Research shows that programming and coaching designed to focus on exploratory movements and courage in children helps them feel confident and develop new abilities when faced with physical activity (Ojeda-Troncoso & Campos-Campos, 2025; Sulistiyowati et al., 2022). In this context, children are required to make individual efforts to overcome physical challenges, which aligns with other research that emphasizes the importance of exercise for children's motor development (Soccorso et al., 2024).

Children's ability to run and jump over obstacles improved in the posttest, as evidenced by more consistent scores. These results reflect greater mastery of higher motor skills, which are crucial for children's social lives and health. Several studies have emphasized the importance of physical activities that trigger complex motor interactions in developing social and motor skills in children (Granda et al., 2025; Talbot & Barends, 2024). Research shows that children who engage in physical play not only improve their gross motor skills but also their social and leadership skills (Daum et al., 2022; Murcia et al., 2024).

Assessment of children's balance after landing from a jump showed more stable and higher posttest scores. This reflects the child's ability to control their body effectively, indicating that they can better manage their balance. Research shows that comprehensive interventions in developing balance skills are directly related to the achievement of other motor developmental milestones, such as trunk control and postural control, which are crucial at this age (Chansa-Kabali, 2022; Vanhala et al., 2022).

Significant improvements in coordination between running and jumping movements were also demonstrated in the posttest results. Motor coordination is a crucial skill in many of children's daily activities and impacts their social integration. The ability to maintain rhythm and sequence in movements is acquired through targeted practice, developing more efficient muscle memory and improved body control (Adam & Byrne, 2023; Johnson et al., 2023). Research shows that good motor development not only impacts physical health but also contributes to positive academic development and social skills (Fang et al., 2022).

Children's participation in hurdle jumping activities showed that better posttest results were associated with increased self-confidence and courage. This is related to the finding that children who engage in regular physical activity tend to show improvements in socio-emotional skills (Simcoe et al., 2024; Zarra-Nezhad et al., 2023). Studies have found that positive experiences while participating in physical activity help build self-confidence and a sense of acceptance in children's social environment (Relkin et al., 2024).

The exercises and interventions provided a positive impact on children's gross motor development. Improved posttest results for each indicator indicate that a structured exercise program focused on physical movement development is crucial for stimulating children's motor, cognitive, and social growth. Implications for educational practice emphasize the importance of integrating physical activity into the curriculum as a key to supporting various aspects of early childhood development (Sevón et al., 2023).

The role of teachers in organizing fun physical activities can help children become more actively engaged (Kurnia et al., 2024). Therefore, it is important for educators to understand how to create a stimulating learning environment so that children engage in positive experiences. By strengthening the role of kindergartens in providing educational play experiences such as obstacle jumps, we not only support children's physical development but also help them develop essential social skills for their future lives. Therefore, it is crucial for educators to design curricula that emphasize physical play in early childhood learning contexts.

CONCLUSION

This study shows that the game of jumping over obstacles significantly improves the gross motor skills of children aged 5–6 years in kindergarten. The results of the statistical test ($t = 18.965$; $p = 0.000$) prove that there is a significant difference between the results pretest and posttest improvements were seen in the following aspects: jumping from a height without assistance, balance upon landing, coordination between running and jumping, and children's courage and initiative. This activity not only improves physical motor skills but also strengthens children's self-confidence and motivation. This game is effectively implemented in kindergarten education as a fun tool for stimulating motor skills, encouraging physical activity among children, and reducing dependence on passive activities such as playing with gadgets.

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