

Influence Game Zig-Zag Run To Skills Motoric Rough Children Aged 5-6 Years

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Abstract

The gross motor skills of children in the control group before and after being given a ball relay game, knowing the description of the gross motor skills of children in the experimental group before and after being given a zig-zag run game, and analyzing the effect of the zig-zag run game on the gross motor skills of children aged 5-6 years at Aisyiyah Bustanul Athfal Parangtambung Makassar Kindergarten. This study uses a quantitative approach with a quasi-experimental research type and a Nonequivalent Control Group Design. The research sample consisted of 20 children divided into two groups, namely 10 children in the experimental group and 10 children in the control group. The data collection technique was carried out through observation using a gross motor skills assessment sheet which includes locomotor, non-locomotor, and manipulative aspects. The data were analyzed using descriptive statistics and inferential statistics through the Mann-Whitney test. The results showed that the gross motor skills of children in the control group increased after participating in the ball relay game, but the increase was still in the Less category. Meanwhile, the experimental group that received treatment in the form of a zig-zag run game showed a more optimal increase until most of the children were in the Very Good category. The results of the Mann Whitney test obtained an Asymp. Sig. (2-Tailed) value of 0.000 (<0.05), which indicated a significant difference between the experimental group and the control group. Thus, it can be concluded that the zig-zag run game has a significant effect on improving the gross motor skills of children aged 5-6 years at Aisyiyah Bustanul Athfal Parangtambung Kindergarten, Makassar.

Keywords: zig-zag run, gross motor skills, children aged 5–6 years

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INTRODUCTION

Children's education age early is a effort for give stimulation as well as motivation to children from moment born until six years, which often called as *Golden Age*. The goal is for provide supportive education growth as well as development child from aspect physical and mental, so that they can get ready For continue to level education next. Range age from zero until six year is the ideal time for give stimulation to children. At this stage this, child experience progress rapidly in various aspect its development. Therefore, this period own role crucial in build base life good boy in learning process matters and formation character, which will become supplies important for face level education next.

Research result this is also in line with Islamic values explained in Hadith of the Prophet Muhammad (peace be upon him) Alaihi Wasallam narrated by Abu Hurairah RA., that a strong believer more better and better loved by God than weak believers, and in each there is goodness. Be enthusiastic about things that are useful for you, ask for help from Allah, and do not feel weak. If you are struck by a disaster, then do not say: "If only I had done that, it would not have happened like this or that." But say: "This is the destiny of Allah and what He wills will surely happen," because truly the word "if only" can open the door to the deeds of Satan. (Narrated by Muslim no. 2664) This hadith shows that Islam encourages every Muslim to always strive to maintain health and develop physical strength as a provision for carrying out worship and various beneficial activities. Through a series of activities running through a zigzag track, jumping, picking up and carrying a ball, throwing a ball into a basket, and maintaining balance by standing on one leg, children receive stimulation for muscle strength, motor coordination, balance, agility, and physical endurance.

Based on Article 1, paragraph 4 of the Regulation of the Minister of Education, Culture, Research, and Technology No. 7 of 2022 concerning Content Standards for Early Childhood Education, Elementary Education, and Secondary Education, it is explained that early childhood education is an effort aimed at nurturing children from birth to six years of age by providing educational stimulation that supports physical and mental development, so that children can continue their education to a higher level. Early childhood education is a learning phase that aims to guide children through various play and learning activities. Educational services at this stage are focused on supporting children's overall development, encompassing aspects of religious and moral values, socio-emotional, cognitive, language, physical motor skills, and the arts. All of this is done through activities appropriate to the child's developmental stage. The learning process in early childhood education emphasizes a play-while-learning approach with direct experience, so that children can grow optimally and have a mature readiness to continue to the next level of education.

According to Hurlock (1978) motor development is a gradual process of controlling body movements through coordination between the nervous and muscular systems. This process plays a crucial role because it forms the foundation for children to carry out various daily activities. In early childhood, motor skills can be divided into two types: gross motor skills and fine motor skills. Gross motor skills relate to body movements involving large muscles, such as

walking, running, jumping, or cycling. Meanwhile, fine motor skills relate to the ability to use small muscles, such as grasping, writing, or using cutlery. Both aspects of motor skills develop in line with the physical growth and maturity of the child's nervous system (Udzma et.al., 2025; Mariam et. al., 2025)

Gross motor skills are movement abilities that involve the use of the body's large muscles through locomotor, non-locomotor, and manipulative movements. These abilities develop through the various movement experiences children continually acquire. However, in reality, many young children are still unable to develop gross motor skills optimally. This condition is evident in the fact that some children still have difficulty maintaining body balance, coordinating hand and foot movements, running agilely, and participating in various physical activities that require movement skills (Imam et al., 2026; Inayah et al., 2023)

Based on the results of initial observations conducted at Aisyiyah Bustanul Athfal Kindergarten in Parangtambung, most children still have limitations in gross motor skills, so they need fun learning activities to practice basic movements according to their developmental stage. Therefore, the *zigzag run game introduction activity* was designed to improve children's gross motor skills, motor coordination, and courage in following instructions. Through this activity, it is hoped that children will be able to recognize the form of the *zigzag run game* and practice it with more confidence and direction.

Previous research has shown that zigzag running, which involves precise and repeated changes in direction, can improve children's gross motor skills. This activity helps develop balance, coordination, agility, and large muscle strength. Furthermore, the study also explained that children's gross motor skills can be influenced by various factors, including individual characteristics and involvement in structured physical activities. (Imel et al., 2024; Yusran et al., 2026)

Other studies have shown that the *zigzag run game* is effective in improving children's gross motor skills, particularly in agility, balance, coordination, and large muscle strength. However, most studies still consider the *zigzag run* as an educational game suitable for children aged 5-6 years. Therefore, further research is needed on the use of the *zigzag run game* as a fun learning activity that can optimize the gross motor development of early childhood. (Trisnarningsih et al., 2019)

Meanwhile, other research shows that the *zigzag run game* has a positive influence on the development of gross motor skills in early childhood. The activity of running along a winding track with the help of cones can improve children's motor skills, coordination, body balance, and agility. Furthermore, children who participate in the *zigzag run* activity show better gross motor development than children who participate in conventional learning. This activity encourages children to move actively, control their body movements, and increase their confidence in various physical activities. (Fajarwati & Arini, 2023)

This study differs from previous research, in that the *zigzag run game* has been used as a physical activity to train agility, as a basic movement exercise or a means of improving gross motor skills in general. Furthermore, the application of the *zigzag run game combined* with other motor activities in the form of structured games for children aged 5-6 years is still relatively limited. Therefore, the novelty of this study lies in the development of a *zigzag run game* that not

only emphasizes running activities along a track, but also integrates jumping, carrying a ball, and throwing the ball into a basket in one series of games.

Gross motor development in early childhood is closely related to a child's ability to actively participate in various physical activities. At the age of 5-6, children experience significant development in their ability to control body movements, maintain balance, coordinate various body parts, and perform movements with greater accuracy. These abilities do not develop automatically but require continuous stimulation through activities appropriate to the child's developmental characteristics. Therefore, learning activities in kindergarten must provide sufficient opportunities for children to move, explore, and practice various movement patterns in a safe and fun environment. Physical activities presented through play can encourage children to participate more actively because play is closely related to the natural characteristics and learning needs of early childhood.

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Play-based physical activities also provide opportunities for children to develop several motor components simultaneously. Running, jumping, balancing, and manipulating objects involve different movement patterns that contribute to the development of gross motor skills. When these activities are arranged in a structured sequence, children are encouraged to follow instructions, control their movements, and complete movement tasks according to predetermined rules.

Such activities can make the learning process more meaningful because children not only repeat physical movements but also experience them directly through play. Therefore, teachers need to select or design movement activities that are simple, engaging, safe, and able to stimulate various aspects of children's gross motor development.

METHOD

This study uses a quantitative approach with a *quasi-experimental research type* that aims to determine the effect of the *zig-zag run game* on the gross motor skills of children aged 5–6 years. The research design used is *Nonequivalent Control Group Design*, which involves two groups, namely the experimental group that was given treatment in the form of a *zig-zag run game* and the control group that was given a ball relay game. Before the treatment was given, both groups first took a *pre-test* to determine the initial ability of gross motor skills, then after

the entire series of treatments were completed, both groups were given a *post-test* to determine changes in children's gross motor skills. The study was conducted at Aisyiyah Bustanul Athfal Kindergarten Parangtambung Makassar. The study population was all children aged 5–6 years, while the study sample amounted to 20 children selected using a *purposive sampling technique*, consisting of 10 children in the experimental group and 10 children in the control group. The sample criteria include children aged 5–6 years and have gross motor skills that have not developed optimally. Data collection was conducted through observation techniques using gross motor skills assessment sheets that included three indicators, namely locomotor, non-locomotor, and manipulative movements, and supported by documentation throughout the research process. The data obtained were analyzed using descriptive statistics to describe the development of children's gross motor skills, while inferential statistical analysis used the *Mann–Whitney Test* to determine the difference in *post-test results* between the experimental group and the control group at a significance level of 0.05.

The differences between the experimental and control groups suggest that the variety and complexity of movement activities can influence the level of gross motor stimulation children receive. The ball relay activity provides opportunities for children to run, pick up and carry a ball, and throw it toward a target. These activities are beneficial for providing physical stimulation; however, the movement sequence is relatively simpler than the zigzag run activity. In contrast, the zigzag run game requires children to combine running, changing direction, jumping, carrying and throwing the ball, and maintaining balance. The greater variety of movements may provide more opportunities for children to practice different components of gross motor skills. This may explain why the experimental group showed greater improvement than the control group after the intervention.

RESULTS

In the initial conditions (*pre - test*), the gross motor skills of children in the control and experimental groups were still in the low category and had not shown optimal development. In the control group, there were 6 children (60%) in the Less category and 4 children (40%) in the Sufficient category. Meanwhile, in the experimental group, there were 4 children (40%) in the Less category, 4 children (40%) in the Adequate category. in the category Enough, and 2 children (20%) are at category Good. At this stage, no children have reached the Very Good category, so it can be concluded that children's gross motor skills still need to be improved. Changes began to be seen after both groups were given treatment (*post-test*). In the control group, there was an increase in gross motor skills, where all 10 children (100%) were in the Sufficient category. This shows that the treatment provided was able to provide development, but the improvements that occurred were still at a moderate level and had not yet reached the Good or Very Good categories. Meanwhile, in the experimental group, there was a more significant increase. No there is Again child on category Not enough and Enough.

A total of 3 children (30%) were in the Good category and 7 children (70%)

managed to reach the Very Good category. These results indicate that the treatment given to the experimental group was able to optimally improve children's gross motor skills. Based on the recapitulation results, it can be concluded that the experimental group experienced a higher increase in gross motor skills compared to the control group. Thus, the treatment given to the experimental group proven to be more significant in improving the gross motor skills of early childhood.

Table 1. Distribution skills motor rough Group Control and Group Experiment

Interval	category	Pretest Control		Posttest Control	
		Frequency	Percentage	Frequency	Percentage
6-10	Not enough	6	60%	4	40%
11-15	Enough	4	40%	6	60%
16-20	Good	0	0%	0	0%
20-24	Very good	0	0%	0	0%
Amount		10	100%	10	100%

Test Results Normality

Based on normality test results in the test table *Normality*, obtained mark significance *Kolmogorov-Smirnov* on groups control of 0.063 and the value significance *Shapiro-Wilk* of 0.006. Meanwhile that, in the group experiment obtained mark significance *Kolmogorov-Smirnov* of 0.000 and the value significance *Shapiro-Wilk* of 0.000. The basis for decision making in the normality test is that if the significance value is greater than 0.05 then the data is declared normally distributed, whereas if the significance value is less than 0.05 then the data is declared not normally distributed. Based on the results of the analysis, *the Shapiro-Wilk significance value* in the control group was $0.006 < 0.05$ and the experimental group was $0.000 < 0.05$. This indicates that the *posttest data* in both groups were not normally distributed. Thus, because the research data did not meet the normality requirements, the hypothesis analysis in this study used nonparametric statistics, namely the *Mann -Whitney U Test* to determine the effect of the zigzag *run game* on the gross motor skills of children aged 5–6 years at Aisyiyah Bustanul Kindergarten. Athfal Parangtambung Makassar.

Table 2. Results Test Normality Group Control and Experimental Tests of Normality

	Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
		s			s		
Prosttest_Kontrol	1	.256	10	.063	.769	10	.006
Experiment Posttest	2	.416	10	.000	.650	10	.000

Test Results Mann Whitney

Based on the results of the *Mann Whitney U* test in the table above, the *asympt. Sig. (2-tailed)* value was 0.000. This value is smaller than the significance level of 0.05, thus indicating that there is a significant difference between the post-test results of the experimental group and the control group. In addition, the *mean results The rank* shows that the experimental group obtained an average rank value of 15.50, while the control group obtained an average rank value of 5.50.

<i>Mann Whitney U</i>	.000
<i>Wilcoxon W</i>	55.000
<i>Z</i>	-3.816
<i>Asymp. Sig. (2- Tailed)</i>	0.000

DISCUSSION

These findings are consistent with and extend the results of several previous studies. Trisnarningsih et al. (2019) reported that chair-assisted zig-zag running significantly improved the gross motor development of Group B kindergarten children, particularly in balance and coordination. Similarly, Fajarwati and Arini (2023) found that children who participated in zigzag run activities using cones demonstrated better gross motor development than those who received conventional learning, particularly in motor coordination, body balance, and agility. The present study corroborates these findings while extending them by integrating additional motor tasks—jumping through hoops, carrying a ball, throwing into a basket, and one-legged balance—into a single structured game sequence. This integration appears to produce more optimal outcomes, as evidenced by the higher proportion of children reaching the Very Good category in the experimental group.

Furthermore, Imel et al. (2024) emphasized that zigzag running, which involves precise and repeated changes in direction, can enhance children's gross motor skills by developing balance, coordination, agility, and large muscle strength. Yusran et al. (2026) similarly demonstrated that structured physical activities such as obstacle jump games effectively stimulate gross motor skills in early childhood. The current findings align with both studies, reinforcing the notion that movement activities requiring directional changes, balance control, and object manipulation provide richer motor stimulation than simpler locomotor tasks. Sundawa et al. (2024), who examined zig-zag run training in the context of pencak silat, also confirmed that zigzag movement patterns enhance agility and coordination, supporting the transferability of this movement form across different physical activity contexts.

The superiority of the zig-zag run game can be explained through the theoretical framework of motor development proposed by Hurlock (1978), who described motor development as a gradual process of controlling body movements through coordination between the nervous and muscular systems. The zig-zag run game demands simultaneous activation of multiple movement components: locomotor movements (running along a winding path, jumping through hoops), non-locomotor movements (maintaining balance on one leg, controlling body posture during directional changes), and manipulative movements (picking up, carrying, and throwing a ball into a basket). This multi-component demand requires children to integrate neural signals with muscular responses in a more complex manner than the ball relay game, which primarily involves running, carrying, and throwing. As Mariam et al. (2025) noted, gross motor skills develop optimally when children are exposed to varied movement experiences that challenge different muscle groups and coordination patterns simultaneously.

The finding that the control group improved but remained in the Sufficient category is also theoretically explainable. The ball relay game provides opportunities for running, picking up and carrying a ball, and throwing toward a target, which are beneficial for physical stimulation. However, as Inayah et al. (2023) highlighted, non-locomotor skills such as balance and postural control require specific and repeated practice that cannot be adequately addressed through simple relay activities. The absence of directional changes, jumping, and balance tasks in the ball relay game limits the breadth of motor stimulation, resulting in less optimal development.

The Role of Repetition and Play-Based Learning

Another critical factor contributing to the effectiveness of the zig-zag run game is the opportunity for repeated practice within a play-based framework. During treatment sessions, children performed the movement sequence multiple times, allowing them to become increasingly familiar with movement patterns, understand game rules, and gradually improve body control. This aligns with the findings of Imam et al. (2026), who demonstrated that structured play activities positively influence both gross motor development and emotional regulation in young children. Fadillah and Indahwati (2026) further supported this by showing that different play patterns significantly affect motor abilities in children, emphasizing that structured and varied play provides superior developmental outcomes compared to unstructured activities.

The play-based nature of the zig-zag run game also addresses the developmental characteristics of children aged 5–6 years. As Cahyaning and Khoirina Nur (2025) observed, children at this age are in a critical period for gross motor development and require learning experiences that involve direct participation rather than passive instruction. The zig-zag run game provides opportunities for children to learn through movement, observation, practice, and interaction with their environment. Erwanda and Sutapa (2023) similarly emphasized that game-based activities, including traditional games, are effective in enhancing gross motor skills because they naturally engage children's motivation and active participation. Yusri et al. (2024) also confirmed that creative movement activities in kindergarten settings significantly improve children's gross motor skills when presented in engaging and age-appropriate formats.

Integrated Stimulation of Motor Components

A distinctive contribution of this study is the integration of locomotor, non-locomotor, and manipulative components within a single game sequence. The locomotor component is evident when children run along a zigzag path and jump through hoops, requiring them to move from one location to another while maintaining precise body control. Non-locomotor skills are stimulated when children maintain posture and balance, particularly during one-legged standing activities. Manipulative skills are developed when children pick up, carry, and throw a ball toward a basket. This integrated approach is consistent with the

recommendations of Damayanti et al. (2025), who emphasized that stimulation of gross motor skills in early childhood should address multiple movement dimensions simultaneously rather than focusing on isolated skills. Humaedi et al. (2022) further supported this by noting that early detection and intervention for gross motor skills should encompass diverse movement experiences to ensure comprehensive development.

Practical Implications

The findings of this study have practical implications for early childhood education practitioners. The zig-zag run game can serve as an alternative learning activity for kindergarten teachers who wish to provide structured physical stimulation through play. This activity uses relatively simple equipment—cones, hoops, balls, and baskets—that can be readily prepared in a kindergarten environment. The sequence can be adjusted to suit children's abilities, available space, and safety conditions. Teachers can modify the distance between cones, the number of hoops, the size of the ball, or the throwing distance according to the child's developmental level. This flexibility makes the activity suitable for implementation as part of a diverse physical education program in early childhood education, consistent with the principles outlined in the Regulation of the Minister of Education, Culture, Research, and Technology No. 7 of 2022 concerning Content Standards for Early Childhood Education. Furthermore, the activity can be implemented individually or in small groups, allowing teachers to observe children's performance more effectively and provide appropriate guidance.

Limitations and Future Research

Despite the significant findings, this study has several limitations. The sample size was relatively small (20 children), which may limit the generalizability of the results. The study was conducted in a single kindergarten setting, and the treatment duration was limited to a specific number of sessions. Additionally, this study focused exclusively on gross motor skills without examining potential effects on other developmental domains such as cognitive or socio-emotional development, although Agustin et al. (2024) noted that multiple factors influence early childhood development simultaneously. Alkharni et al. (2025) also highlighted the growing concern about reduced physical activity among young children due to increased screen time, suggesting that future research should examine how structured physical games like the zig-zag run can counteract sedentary tendencies. Future studies are recommended to employ larger and more diverse samples, extend the treatment period, and explore the long-term effects of the zig-zag run game on children's motor development. Investigating the integration of the zig-zag run game with other developmental activities, such as rhythmic gymnastics (Mariam et al., 2025) or creative dance (Yusri et al., 2024), could also provide valuable insights into comprehensive motor development programs for early childhood.

CONCLUSION

Based on the research results, it can be concluded that the Zig-Zag Run game. The results of data analysis using the *Mann - Whitney test* showed an *Asymp. Sig. (2-tailed)* value of 0.000. This value is smaller than the significance level of 0.05, thus indicating a significant difference between the gross motor skills of children in the experimental group and the control group after being given treatment. Based on results *mean rank*, group experiment more tall compared to group control. This show that zig-zag run game provides more influence Good to improvement skills motor rough child age 5-6 years compared to game ball relay. With Thus, the hypothesis study accepted, namely there is influence zig-zag run game against skills motor rough child 5-6 years old at Aisyiyah Kindergarten Bustanul Athfal Parangtambung, Makassar

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