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Analysis of Participation in Traditional Egrang Games on Balance in Elementary School Students

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Abstract

There are various kinds of traditional game toys, such as bamboo stilts, which have strong educational and motor skills value, particularly for static and dynamic balance training, coordination, and core muscles. Early engagement with digital objects will attenuate participation in traditional forms of gaming. This study aims to examine the relationship between traditional stilts games and balance ability for elementary school children. The research used a quantitative, cross-sectional design and purposively selected 49 grade V students from Musuk Public Elementary School , Musuk District, Boyolali Regency as the study's sample. Participation in the egrang games was categorized as low, medium, or high. Balance of the body was, however, measured by the Static Stork and Dynamic Beam Scale. The data were compared using descriptive statistics, normality and homogeneity tests, and Pearson's correlation at the $p < 0.05$ significance level. Results The frequency of playing e-grang games was significantly associated with static balance ($r = 0.605$; $p = 0.000$), but not with dynamic balance ($r = -0.276$; $p = 0.055$). It can be said that the traditional game (egrang) is more effective at improving body steadiness when the body is static than when it is dynamic. The development of the egrang game can be used as one form of active learning on static balance among elementary school students.

How to Cite

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INTRODUCTION

Childhood is a critical period in which social, mental, and health development are all closely linked and interdependent. At this stage, play activities are essential as a natural medium for developing motor skills, building social interactions, and shaping physical resilience. However, in recent decades, the world has seen significant changes in children›s play habits, in step with advances in digital technology, including in Indonesia. By 2024, Versity Data from the Central Statistics Agency (BPS) revealed that 58.25% of 5-6-year-olds have used a device, and 51.19% are involved in internet contact. Most worryingly, this digital exposure has even broken into children under 12 months of age (5.88%). This is confirmed by Figures from Wisnubroto (2025), which recognize that there are signs of media addiction in children aged 13-14 years in some backward areas. This condition indicates a shift in children›s play patterns from active physical activities to passive digital activities (Rahesti & Irawan, 2024).

The more time children spend with gadgets, the less opportunity they have to engage in physical activities such as running, jumping, or playing traditional games (Muti et al., 2025). In fact, traditional games not only serve as a means of recreation but also have high educational and social value for children's growth (Rahesti & Irawan, 2024). One traditional game with high educational value is bamboo stilts (Rahesti, Irawan, & Priyono, 2025). This game requires players to master balance, coordination, and courage in maintaining their body position on the bamboo (Rahesti et al., 2025; Rahesti et al., 2023). According to Nugroho (2019), egrang can be used as an alternative in training children›s gross motor skills because playing egrang trains static and dynamic balance, strengthens core muscles, and improves body coordination.

Theoretically, body balance is divided into two types: static and dynamic balance. Static balance is the ability to maintain body stability while stationary, while dynamic balance is the ability to maintain body stability during movement (Wahyono et al., 2021). Both components of balance involve the functions of the vestibular, proprioceptive, and visual systems, as well as neuromuscular coordination (Indarto et al., 2024). Based on the characteristics of the activity, stilts games have the potential to stimulate both types of balance, as players are required to maintain a stable posture while standing on bamboo stilts and maintain body control when moving using stilts (Irawan et al., 2024).

However, the reality on the ground shows that student participation in traditional games is declining (Rahesti & Irawan, 2024). Initial observations in several elementary schools in Boyolali Regency revealed that only a small number of students had ever played bamboo stilts, and most did not understand the basic techniques or physical benefits. This low participation has the potential to reduce motor skills, particularly body balance, which is an important component of children's physical fitness (Suhartantyo et al., 2019). Many elementary schools have also not routinely integrated traditional games into Physical Education, Sports, and Health lessons.

In addition, although several previous studies have stated that traditional games are effective in improving children's motor skills, research that. Specifically, the relationship between participation in stilts games and the development of static and dynamic balance is still very limited. The majority of studies assess the general influence of stilts games but do not differentiate their contribution to the two components of balance (Nasrulloh et al., 2024). Based on the above description, research is needed to analyze the relationship between student participation in traditional stilts games and body balance. This research is important for providing a scientific description of the extent to which active student involvement in traditional games can contribute to balance abilities. In addition, the results of this study are expected to provide a basis for Physical Education teachers to optimize traditional games as effective, contextually relevant means of motor learning in elementary schools. This study presents a novelty by specifically examining the relationship between student participation in traditional stilt games and two main components of body balance, namely statistical balance and dynamic balance, which have not been widely studied separately. Most previous studies only assessed the effect of stilt games on general motor skills without differentiating the contribution of games to each type of balance. This study also offers a new approach by capturing the phenomenon of declining children›s involvement in traditional games amidst the dominance of digital activities, thus providing an empirical picture of the relevance of traditional games as a contextual motor learning tool for today›s elementary school children.

METHOD

This study used a quantitative method with a cross-sectional approach to analyze the relationship between participation in traditional stilts games and students' body balance. The research population consisted of all students at Musuk Public Elementary School 1, Musuk Subdistrict, Musuk District, Boyolali Regency, Central Java Province, and the research sample consisted of 49 fifth-grade students selected using purposive sampling based on the following inclusion criteria: (1) fifth-grade students, (2) willing to participate, and (3) obtained parental consent. Informed consent was obtained from parents/guardians through a consent form that explained the purpose, benefits, and procedures of the study, as well as guaranteed the confidentiality of participants' identities and their right to withdraw at any time without consequences. Data were collected through body balance measurement instruments and egrang participation categories (low, medium, high), then analyzed quantitatively using SPSS version 25. Descriptive statistics were calculated, and the normality and homogeneity assumptions of the samples were assessed and not violated before the hypothesis test. The relationship between egrang participation and body balance was examined using the Chi-Square test, and Spearman's non-parametric correlation analysis was used to assess the strength and direction of the relationship at the significance level $p < 0.05$. The findings from the analysis were displayed in a Table format and supported by interpretive narratives to aid comprehension of the research outcomes.

RESULTS AND DISCUSSION

Statistical data analysis of samples from 49 samples consisting of 25 males and 24 females is presented in **Table 1.**

Table 1. Descriptive Statistics of Participation in the Traditional Egrang Game

Variable	Min	Max	Mean ± Std Dev	Description
Height	118	156	142.22 ± 7.88	
Weight	19	65	35.49 ± 8.54	
BMI	13.65	28.89	17.39 ± 3.18	underweight
Participation in Traditional				
Egrang Games	1	7	2.90 ± 1.70	Normal
Standing Stroke	10.00	41.00	22.12 ± 8.14	Moderate
Balance Beam	2.10	7.86	5.46 ± 1.47	Intermediate Level

This study involved 49 respondents. Descriptive statistical analysis showed that the variable of Participation in Traditional Egrang Games ranged from 1 to 7, with an average of 2.90 and a standard deviation of 1.70, indicating that the level of student participation in egrang games was in the low to moderate category. Balance ability, as measured by the Standing Stork Test, showed a range of 10–41 seconds, with an average of 22.12 seconds and a standard deviation of 8.14. Meanwhile, balance ability using the Balance Beam test ranged from 2.10 to 7.86 seconds, with an average value of 5.46 seconds and a standard deviation of 1.47. This average value illustrates that most students were able to maintain body stability in the moderate category. In addition, the respondents' physical characteristics data included height, weight, and Body Mass Index (BMI). Height had an average of 142.22, weight had an average of 36.49, and BMI had an average of 17.39, which was in line with the standard range for ages 9–12 years.

Table 2. Results of the Prerequisite Test

Test Item	Asymp. Sig.	Description
Normality of the Standing Stroke Test	0.067>0.05	Normal
Balance Beam Normality	0.185>0.05	Normal
Homogeneity of Standing Stroke Test	0.160>0.05	Homogeneous
Homogeneity of the Balance Beam	0.082>0.05	Homogeneous
Linearity of Participation with Stroke Test	0.000<0.05	Linear
Linearity of Participation with Balance Beam	0.001<0.05	Linear

Based on the normality test results, both balance measurement instruments showed Asymp.Sig values of 0.067 for the Standing Stork Test and 0.185 for the Balance Beam, which means that both variables are normally distributed because the significance value is > 0.05. The results of the homogeneity of variance test show that the Standing Stork Test has a value of 0.160 and the Balance Beam has a value of 0.082, both of which are greater than 0.05, so it can be stated that the data is homogeneous. Furthermore, the linearity test between participation in stilts games and balance ability obtained a significance value of 0.000 for the Standing Stork Test and 0.001 for the Balance Beam (<0.05). Thus, it can be concluded that there is a significant linear relationship between participation in traditional stilts games and students' balance ability.

Table 3. Correlation Test

Relationship	Correlation Coefficient	Sig. (p)	Description
Participation in Egrang with Static Balance (Standing Strock)	0.605	0.000	Significant
Participation in Egrang with Dynamic Balance (Balance Beam)	-0.276	0.055	Not Significant

Based on the results of the Pearson correlation test in **Table 3**, the correlation coefficient between participation in the traditional Egrang game and static balance (Standing Stork Test) was r = 0.605 with a significance level of p = 0.000< 0.05. Thus, increased student participation in the Egrang game does not directly affect dynamic balance ability. Overall, the results of the study indicate that the traditional game of egrang is more effective in training static balance than dynamic balance. This may be because activities in the game of egrang involve more of the ability to maintain a stable body position on a single point of support, thus contributing more to the development of static postural control than the ability to move in a balanced manner along a path.

The analysis results show that participation in the traditional egrang game has a strong and significant relationship with students' static balance ability, with a correlation value of r = 0.605 and p = 0.000 (<0.05). These findings indicate that the higher the level of student activity in participating in the egrang game, the better their ability to maintain their body position in a stationary condition without losing stability. The egrang game requires players to keep their body's center of gravity balanced on two narrow points of support, namely the egrang sticks, so that the sensorimotor, proprioceptive, and postural control systems receive intensive training stimuli (Aljupri, 2023) . Biomechanically, static balance is greatly influenced by postural muscle strength (core stability), the vestibular system, and the ability to maintain body control against gravitational forces in a stable position (Kalang, 2024). Activities in the egrang game directly involve these elements when players must maintain an upright body position, control stick vibrations, and adjust body balance to micro- movements on the support points.

The correlation value obtained was r = 0.605 with p = 0.000, indicating that the more often and actively students participated in the stilts game, the better their ability to maintain body stability in a stationary position. High participation in stilts requires students to maintain an upright body position on a narrow support, so that the postural control system, neuromuscular coordination, and core muscles are trained to maintain balance. The repetitive training process causes motor adaptation that improves the ability to regulate the center of gravity and the body's response to small disturbances on the support. Thus, the traditional egrang game has been proven to have a significant contribution to improving static balance ability. (Mujtahidin & Rachman, 2021) The egrang game involves the ability to maintain a stable body position with a small and high support. When students stand on the egrang stick, the body automatically activates a balance control mechanism that involves the coordination of sensory (visual, vestibular, proprioceptive) and motor systems (Tubuh et al., n.d.). The ability to control body posture in such situations is an important factor in static balance. In stilts, players must adapt to vibrations on the sticks and adjust their foot position and body direction to prevent falling. This develops postural skills and increases overall body stability. The findings of the present study are consistent with the balance theory, as training in postural control can increase performance while maintaining body position on a single point of support.

Meanwhile, the present findings indicate that there is no significant correlation between participation in stilts games and dynamic balance performance. When the correlation between stilts game participation and dynamic balance is analyzed, the results yield a correlation coefficient of r = −0.276 (p > 0.05), indicating no significant relationship between stilts game participation and dynamic balance. Therefore, increasing the frequency and intensity of participation in stilts games does not directly promote students' ability to maintain balance when moving.

Dynamic balance is more associated with the ability to coordinate movement, reaction speed, and adapt to changes in trajectory and leg muscle strength during changing direction maupun cepat (Amarseto et al., 2025). In the meantime, stilts do require players to keep their bodies in an upright position, with only one high sitting (for game action), along with a movement pattern that is more rhythmic and repetitive (Anas Mukhtar & Gatut Rubiono, 2022). As a result, the stimuli produced by stilts highlight postural control rather than aspects of complex movement transfer that underpin dynamic balance. The egrang tool does not affect dynamic balance. This explains why participation in egrang games does not provide a significant improvement in dyna-

mic balance. These findings reinforce the theory that the characteristics of the exercise determine the components of motor skills that (Mustafa & Sugiharto, 2020). Improving dynamic balance requires a variety of exercises involving changes in speed, direction, and body position, such as zigzag running, obstacle jumping, or walking on a long beam. The activities that occur in the egrang game focus more on the players' efforts to maintain stability in an upright position and do not involve many rapid movements along the track (Bakhtiar, 2018). Therefore, increased participation does not necessarily lead to an increase in dynamic balance ability.

According to , the characteristics of activities in egrang games are more dominant in involving static abilities, where students try to maintain a balanced body position while stationary or with very limited movement(Soemardiawan et al., 2023). This is why egrang games do not contribute significantly to dynamic balance, as this type of balance requires activities that demand rapid shifts in weight, changes in direction, and complex postural control while moving. These qualities are also developed more through practices that facilitate moving in varied and changing directions, such as zig-zag running or floor exercises (sports games requiring rapid , repeated changes of position). These results suggest that each game or physical activity has distinct focuses and movement effects, depending on its motion characteristics. Although a direct comparison between the two studies may not be justified, it is clear that static games contribute more to static than to dynamic balance. This indicates that the specific transfer training effect from a stiltz game is present (Purnamaningtyas et al., 2024). In the indirect condition, significant transfer effects on specific motor performance have been observed, consistent with the imitative model of the game. With respect to physical education, these findings provide an essential guideline for choosing the type of game or exercise based on learning demands. Egrang games may be an effective option for this purpose for those who favor static balance, given the characteristics of elementary school students.

Certain traditional games are not only generally beneficial for motor fitness development but also focus on contributing to specific components of movement ability (Qomariah & Hamidah, 2022). Until now, research on traditional games has mostly focused on general physical fitness development, but this study clarifies that the egrang game has a stronger influence on static balance than dynamic balance.

CONCLUSION

The results of the study found that participation in the traditional game of stilts has a strong and significant relationship with students' static balance abilities. This means that the higher the level of student participation in playing egrang, the better their ability to maintain body stability in a stationary position. However, there was no significant relationship between participation in egrang and dynamic balance. Thus, increased participation in stilts does not directly improve the ability to maintain body balance when moving or changing position. Therefore, stilts can be recommended as an alternative physical activity and learning strategy in physical education to improve static postural control abilities. Further research is recommended to examine exercise interventions and compare the effectiveness of other traditional game programs in developing static and dynamic balance.

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