

The Effect of Modifying the Traditional Hip-Hap Matras Game on the Physical and Motor Development of Children Aged 5–6 Years

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ABSTRACT

Physical-motor development is an important aspect of early childhood education that requires stimulation through safe and enjoyable play activities. This study aimed to determine the effect of a modified traditional patok lele game based on the Hip-Hap Mat on early childhood physical-motor development. The study employed a quantitative approach with a quasi-experimental method using a one-group pretest-posttest design. The participants consisted of 20 children aged 5–6 years selected through purposive sampling. The research instrument was an observation sheet developed based on the indicators of the Peabody Developmental Motor Scales-Second Edition (PDMS-2), covering stationary, locomotion, object manipulation, grasping, and visual-motor integration aspects. The treatment was conducted through Hip-Hap Mat and Hip-Hap Jump activities over eight meetings. Data were analyzed using descriptive statistics and a paired sample t-test. The results showed an improvement in children's physical-motor abilities, with the average pretest score increasing from 55.4% to 82.6% in the posttest. Improvements were observed in balance, locomotor skills, hand-eye coordination, and manipulative movement control. These findings indicate that the Hip-Hap Mat-based traditional game modification positively affects early childhood physical-motor development and has the potential to become an innovative and contextual learning medium in early childhood education.

ABSTRAK

Perkembangan fisik-motorik merupakan aspek penting dalam pendidikan anak usia dini yang memerlukan stimulasi melalui aktivitas bermain yang aman dan menyenangkan. Penelitian ini bertujuan mengetahui pengaruh modifikasi permainan patok lele berbasis Hip-Hap Matras terhadap perkembangan fisik-motorik anak usia dini. Penelitian menggunakan pendekatan kuantitatif dengan desain quasi experimental melalui one-group pretest-posttest design. Subjek penelitian berjumlah 20 anak usia 5–6 tahun yang dipilih menggunakan purposive sampling. Instrumen penelitian berupa lembar observasi berdasarkan indikator Peabody Developmental Motor Scales-Second Edition (PDMS-2) yang meliputi stationary, locomotion, object manipulation, grasping, dan visual-motor integration. Perlakuan diberikan melalui aktivitas permainan Hip-Hap Matras dan Hip-Hap Lompat selama delapan kali pertemuan. Analisis data menggunakan statistik deskriptif dan paired sample t-test. Hasil penelitian menunjukkan peningkatan kemampuan fisik-motorik anak dari rata-rata pretest 55,4% menjadi 82,6% pada posttest. Peningkatan terlihat pada aspek keseimbangan, kemampuan lokomotor, koordinasi mata-tangan, dan kontrol gerak manipulatif. Temuan ini menunjukkan bahwa permainan tradisional berbasis Hip-Hap Matras berpengaruh positif terhadap perkembangan fisik-motorik anak serta berpotensi menjadi media pembelajaran yang inovatif dan kontekstual di PAUD.

ARTICLE HISTORY

Received 10 December 2025

Accepted 26 January 2026

KEYWORDS

Traditional Games; Hip-Hap Matras; Gross Motor Skills; Fine Motor Skills; Chilhood

KATA KUNCI

Permainan Tradisional; Hip-Hap Matras; Motorik Kasar; Motorik Halus; Anak Usia Dini

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Introduction

Early Childhood Education (PAUD) is a fundamental stage in a child's development because this period is marked by rapid growth in physical, cognitive, social, emotional, and language aspects. One aspect of development that plays a crucial role in supporting a child's readiness to learn is physical-motor development. Motor skills relate to a child's ability to control body movements through the coordination of the nervous system, muscles, and sensory perception. Optimal motor development helps children in daily activities, enhances independence, and supports the development of other aspects, including social and cognitive skills (Papalia & Feldman, 2015; Payne & Isaacs, 2017).

Motor development in early childhood consists of gross motor skills and fine motor skills. Gross

motor skills involve the use of large muscles in activities such as running, jumping, maintaining balance, and moving from one place to another. Meanwhile, fine motor skills relate to the coordination of small muscles, particularly the fingers and hands, which require precision of movement and visual-motor integration (Gallahue et al., 2019; Azizah et al., 2023). Both aspects develop gradually through environmental stimulation and the movement experiences provided to the child.

However, the development of digital technology and changes in children's play patterns today have led to a decrease in physical activity among young children. Children tend to spend more time using electronic devices and engaging in sedentary activities rather than actively playing in their surroundings. This situation can affect the development of motor coordination, body balance, and manipulative skills in children if not balanced with adequate motor stimulation (Fadillah et al., 2021; Suryana et al., 2023). Additionally, the variety of educational play equipment (APE) available in early childhood education settings remains relatively limited and has not yet fully integrated gross and fine motor stimulation simultaneously.

Traditional games can serve as an alternative medium for motor stimulation in young children because they incorporate active movement, social interaction, and enjoyable learning experiences. Traditional games also hold cultural value that can be introduced to children from an early age. According to Piaget (1962), play is a vital means for children's cognitive and physical development, as through play, children actively construct learning experiences. Furthermore, Vygotsky (1978) explains that play provides children with the space to develop skills through social interaction and environmental support.

One traditional game with potential to be developed as a motor stimulation medium is the "patok lele" game. This game involves motor coordination, balance, agility, and manipulative skills through activities such as striking and directing objects. However, the use of hardwood tools in the conventional "patok lele" game poses safety risks for young children. Therefore, a safer game modification is needed that aligns with children's developmental characteristics.

Based on these issues, this study developed a modified version of the "patok lele" game using the Hip-Hap Matras as a medium for physical-motor stimulation in young children. This medium was designed using a safe, colorful, multifunctional mat that incorporates jumping, balance maintenance, eye-hand coordination, and manipulative play integrated with movement instructions based on songs. The use of musical elements and rhythmic instructions is known to aid children's motor coordination and concentration during physical activities (Abrams et al., 2010; Levitin & Menon, 2003; Maess et al., 2001; Vuust et al., 2006).

This study aims to determine the effect of a Hip-Hap Matras-based modification of the "patok lele" game on the physical-motor development of early childhood children aged 5–6 years.

Method

This study employed a quantitative approach using a quasi-experimental design, specifically a one-group pretest-posttest design. This design was used to determine the effect of the Hip-Hap Matras media on the physical-motor development of early childhood through the measurement of motor skills before and after the intervention was administered (Sugiyono, 2022).

The study was conducted at an early childhood education institution involving 20 children aged 5–6 years, comprising 11 boys and 9 girls. Research subjects were selected using purposive sampling, considering the children's age appropriateness, physical condition allowing participation in play activities, and active engagement throughout the entire research process.

The research instrument consisted of a motor development observation sheet developed by adapting indicators from the Peabody Developmental Motor Scales-Second Edition (PDMS-2). The observed indicators included the aspects of stationary, locomotion, object manipulation, grasping, and visual-motor integration (Payne & Isaacs, 2017). The instrument uses a scoring range of 0–2: a score of 2 indicates a child who can perform the activity independently and accurately; a score of 1 indicates a child who can perform the activity but still requires assistance or guidance; and a score of 0 indicates a child who cannot yet perform the activity. The instrument was validated through expert judgment by early childhood education specialists and motor development experts.

The research procedure was conducted in three stages. The first stage was a pretest to identify the children's initial motor skills before the intervention was administered. The second stage was the intervention, consisting of the implementation of the Hip-Hap Matras and Hip-Hap Lompat games over eight sessions, each lasting 30–40 minutes. The game activities involved jumping movements, maintaining body balance, eye-hand coordination, and manipulative movements through

a modified mat-based “patok lele” game. The third stage was a posttest to measure the children’s motor skill development after the intervention was conducted.

Research data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to calculate the mean scores, the percentage of developmental achievement, and improvements in the children’s motor skills. Meanwhile, inferential statistics employed a paired-sample t-test to determine differences in the children’s motor skills before and after the intervention was administered.

Result and Discussion

The findings of this study demonstrate that the implementation of the Hip-Hap Matras game contributed positively to the improvement of children’s physical-motor abilities. Observational data revealed a clear increase in motor performance after the intervention was conducted. Prior to the implementation of the game, children’s average physical-motor achievement in the pretest phase was recorded at 55.4%, indicating that several children still experienced difficulties in coordinating movements, maintaining balance, controlling body movements, and performing manipulative motor activities. However, after participating in a series of Hip-Hap Matras activities, the average score increased substantially to 82.6% in the posttest phase. This increase reflects not only quantitative improvement but also visible behavioral changes in children’s confidence, movement fluency, coordination, and participation during learning activities.

The detailed results show that all observed motor aspects experienced improvement after the intervention. The stationary aspect increased from 58.5 to 82.0, indicating that children became more capable of maintaining balance and body stability during movement activities. Improvements were also found in locomotor abilities, which increased from 55.0 to 84.5. This suggests that children developed better movement control when performing activities such as jumping, stepping, moving across patterns, and changing body positions. Similarly, the object manipulation aspect increased from 49.5 to 79.0, demonstrating that children became more skilled in coordinating hand movements, directing objects, and hitting targets during play activities. The grasping aspect also showed improvement from 61.0 to 86.0, while visual-motor integration increased from 53.0 to 81.5. These findings indicate that the Hip-Hap Matras game was able to stimulate both gross and fine motor coordination simultaneously through integrated movement experiences.

Table 1. Results of Children’s Motor Skill Development.

No	Motor Aspect	Pretest Mean	Posttest Mean	Improvement
1	Stationary	58.5	82.0	23.5
2	Locomotion	55.0	84.5	29.5
3	Object Manipulation	49.5	79.0	29.5
4	Grasping	61.0	86.0	25.0
5	Visual-Motor Integration	53.0	81.5	28.5
	Total	55.4	82.6	27.2

The statistical analysis further strengthened these findings. The paired sample t-test produced a significance value of $p < 0.05$, indicating a statistically significant difference between children’s motor abilities before and after participating in the Hip-Hap Matras activities. This result confirms that the intervention had a meaningful effect on children’s physical-motor development. In practical terms, the game successfully created learning experiences that encouraged children to actively engage in movement, coordination, and physical exploration.

The observed improvements suggest that the Hip-Hap Matras game functions effectively as a motor stimulation medium for early childhood education. Throughout the activities, children were involved in various movement tasks such as jumping, balancing, stepping according to patterns, moving from one point to another, and hitting designated targets. These activities required the simultaneous involvement of large and small muscle groups, thereby promoting integrated motor development. The repetitive and structured movement experiences provided through the game enabled children to gradually refine their motor coordination and body control. This finding is consistent with motor development theory, which emphasizes that children’s motor skills develop progressively through repeated, meaningful, and purposeful movement experiences (Payne & Isaacs, 2017; Gallahue et al., 2019).

Among all observed aspects, the greatest improvements were found in locomotion and object manipulation. During the intervention sessions, children appeared increasingly confident when moving across the mat patterns, jumping from one section to another, and coordinating body movements while interacting with game targets. Initially, several children showed hesitation and

difficulty in controlling movement sequences, but over time they became more adaptive and responsive to movement instructions. The improvement in object manipulation skills also demonstrated that the game successfully stimulated hand-eye coordination and movement precision. Activities involving target-hitting, directional movement, and body coordination encouraged children to synchronize visual input with motor responses more effectively.

The physical design of the Hip-Hap Matras also contributed significantly to the effectiveness of the intervention. The use of soft and safe mat materials created a secure play environment that reduced children's fear of falling or making mistakes during movement activities. This sense of safety encouraged children to participate more actively and explore movements more freely. In addition, the colorful visual designs, movement pathways, and patterned spaces on the mat attracted children's attention and increased their enthusiasm during play sessions. Children were not only physically engaged but also cognitively stimulated through visual cues and movement instructions embedded within the game.

These findings can also be explained through the perspective of Dynamic Systems Theory, which proposes that motor development emerges from the interaction between the individual, the task, and the environment. In this study, the Hip-Hap Matras functioned as a stimulating environment that encouraged children to actively interact with movement tasks. The game provided opportunities for exploration, adaptation, and repeated practice, enabling children to continuously adjust and refine their motor responses. The visual elements on the mat served as affordances that guided children in understanding movement directions, spatial positioning, and activity sequences. Consequently, the learning environment became an important factor supporting the development of motor competence.

Another important aspect observed during the intervention was the integration of music and song-based movement instructions. During the activities, children followed rhythmic cues and verbal movement commands accompanied by songs. This approach appeared to increase children's focus, responsiveness, and enthusiasm during play. Musical accompaniment also helped children maintain movement rhythm and sequence more consistently. Previous studies have shown that musical activities activate brain regions associated with motor coordination, timing, attention, and movement processing (Abrams et al., 2010; Levitin & Menon, 2003; Maess et al., 2001; Vuust et al., 2006). Therefore, integrating musical elements into physical play activities can strengthen children's ability to process movement instructions while simultaneously creating enjoyable learning experiences.

Furthermore, the findings of this study are in line with previous research demonstrating that traditional games and movement-based learning activities contribute significantly to improving children's motor development (Fadillah et al., 2021; Sistiari, 2021; Hasanah et al., 2020). However, the present study highlights an additional contribution through the modification of traditional play into a structured mat-based activity that is safer, more adaptive, and more suitable for early childhood learning environments. The Hip-Hap Matras game combines physical activity, visual stimulation, rhythmic instruction, and playful interaction into a single integrated learning medium. This combination allows children to experience movement learning in a manner that is enjoyable, engaging, and developmentally appropriate.

Overall, the study demonstrates that the Hip-Hap Matras game is not merely a recreational activity but also an innovative educational medium capable of supporting holistic physical-motor development in early childhood. Through repeated movement experiences, interactive play situations, visual stimulation, and musical integration, children are encouraged to actively explore movement while developing coordination, balance, manipulation skills, and body control. Therefore, the Hip-Hap Matras game can be considered a contextually relevant, safe, and effective learning medium that can be implemented in early childhood education settings to support children's motor development in a more engaging and meaningful way.

Conclusion

This study demonstrates that the modification of the "patok lele" game based on Hip-Hap Matras has a positive impact on the physical-motor development of young children. The results indicate an improvement in children's motor skills, with the average percentage increasing from 55.4% in the pretest phase to 82.6% in the posttest phase. Improvements were observed in body balance, locomotor skills, hand-eye coordination, and manipulative movement control.

The Hip-Hap Matras medium provides a safe, enjoyable, and movement-rich play experience that supports the motor development needs of young children. Additionally, the use of modified traditional games can serve as a relevant, culture-based learning medium suitable for early childhood

education settings.

Acknowledgments

The authors would like to express their sincere gratitude to the school principals, teachers, parents, and children who participated in this study. Appreciation is also extended to all parties who contributed to the implementation of the research activities and supported the development of the Hip-Hap Mat learning media. The authors are thankful for the valuable assistance, cooperation, and encouragement provided throughout the research process.

Disclosure statement

The authors declare that there is no conflict of interest regarding the publication of this article. The research was conducted independently without any commercial or financial relationships that could be construed as a potential conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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