

Early childhood educators' beliefs on increasing fundamental motor skills by playing games in a physical education context: The contradictory belief

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Received 10 October 2023; Accepted 28 November 2023; Published 11 December 2023

OPEN  ACCESS

ABSTRACT

The development of fundamental motor skills (FMS) is crucial and should begin in early childhood. As of now, several early childhood educators in Indonesia, particularly in West Java, think that incorporating playground games into the classroom curriculum is the best course of action for raising children's FMS. This study aimed to present statistics on FMS findings for early childhood who have incorporated physical activity into the curriculum and to demonstrate that these results are still in conflict with teachers' beliefs. Ex post facto research was applied to one of the early childhood education pilot programs in West Java, Indonesia, including a total of 30 kids. This school's long-standing intervention involves giving children 30 minutes of structured playtime and 30 minutes of unstructured playtime at the start of each learning period. The Test of Gross Motor Development-2 (TGMD-2) was used to measure FMS. The study's findings showed that both boys' and girls' FMS in both locomotor and manipulating components of the movement were very lacking and inversely proportional to teachers' belief who believe that this activity will improve children's motor skills. It is recommended that physical education specialists accompany both structured and unstructured play programs conducted on school playgrounds so that the early childhood education curriculum's programs are properly validated to raise children's FMS following Developmentally Appropriate Practice (DAP).

Keywords: Fundamental motor skills; early childhood educator; playing games; physical education

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[https://doi.org/10.25299/es:ijope.2021.vol4\(3\).14540](https://doi.org/10.25299/es:ijope.2021.vol4(3).14540)

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How to Cite: Friskawati, G. F., Ma'mun, A., & Mahendra, A. (2023). Early childhood educators' beliefs on increasing fundamental motor skills by playing games in a physical education context: The contradictory belief. *Edu Sportivo: Indonesian Journal of Physical Education*, 4(3), 243-255. [https://doi.org/10.25299/es:ijope.2021.vol4\(3\).14540](https://doi.org/10.25299/es:ijope.2021.vol4(3).14540)

Authors' Contribution: a – Study Design; b – Data Collection; c – Statistical Analysis; d – Manuscript Preparation; e – Funds Collection



INTRODUCTION

Fundamental Motor Skills (FMS) development is essential in avoiding toddlers from developing an early sedentary lifestyle (Bolger et al., 2021; Wainwright et al., 2020). It is a vital component of an active way of life and encourages young children to lead healthy, active lives (Johnstone et al., 2018). FMS development is no longer a new topic among policymakers, stakeholders, parents, and guardians. Physical activity serves as a foundation for young children to develop the FMS needed to engage in a variety of play and movement activities (Lindsay et al., 2020). Mastery-oriented in physical education lessons can facilitate greater improvements in FMS development for children of all abilities (Kelly et al., 2019). FMS is also known by terms such as motor skills, motor performance, motor competence, and motor coordination, which are used in much of the literature (Brian et al., 2016; Goodway et al., 2019; Tsuda et al., 2020). The term "FMS"

refers to both specific motor skills (such as running, jumping, and throwing) and the general motor coordination abilities needed in any movement (such as flexibility, efficiency, and stability).

FMS consists of two main components, namely locomotor skills (e.g. running, jumping, hopping) and object control skills (e.g. throwing, catching, kicking) necessary for kids to carry out their daily activities (Goodway et al., 2021). It is frequently defined as a set of processes related to practice or experience that lead to relatively permanent changes in mobility. In other words, FMS typically serves as a building block for more sophisticated and advanced motor skills, such as specialized sports skills or games that allow a child to continue playing games, participating in sports, and engaging in activities throughout their lifetime (Jones et al., 2020).

Children's motor development is crucial from the ages of 3 to 6 years. During these years, they learn the types of basic motor skills such as running and jumping that drive the process of developing their basic motor skills, such as speed, strength, coordination, and balance in physical education (Schmutz et al., 2020). Many physical activities are built on these foundational skills, which can also affect subsequent levels of physical activity in adolescence and maturity. Compared to kids with less developed motor abilities, those with stronger motor skills are more physically active (Fisher et al., 2015). FMS is crucial for children's growth and health advantages and can be evaluated through the process and product of the movement (Robinson et al., 2015). FMS refers to a child's capacity for effective movement throughout infancy, which supports several areas of the child's holistic growth. Early results in communication, socioemotional development, and cognitive development are correlated with fundamental motor skills (Sriwidaningsih & Friskawati, 2022).

Each early childhood education unit's learning process involves the development of early childhood FMS, and teachers are crucial to this process. It is common for teachers to be tasked with offering a variety of movement exercises to encourage their children to reach FMS following their stage of growth and development (Capio et al., 2021). Unfortunately, the practice of teaching gross motor activities is still debatable because the majority of early childhood educators lack the training or courses necessary to understand the fundamentals of young children's motor development (Brian et al., 2016). The National Association for Sports and Physical Education (NASPE) in the United States has emphasized the value of developing FMS for young children and helped early childhood educators create gross motor movement activities that will aid in the learning process during the early years of a child's development (Bishop et al., 2015). The NASPE believes that the basis of fitness and health begins from the moment a child is born until they reach an early age through physical activity guidelines for early childhood. One of the promotion areas is the school, which can actively boost physical activity and enhance FMS every day (Couturier et al., 2015).

In school playgrounds, free play activities typically take the form of basic movements like running, swinging, walking, etc. (Pereira, 2014), which are believed to stimulate the children's FMS (Foulkes et al., 2015; Niemistö et al., 2019). However, this unstructured free-play activity does not directly affect students' FMS (Khalaj, 2014). Studies have found that young children's FMS will be stimulated if they are engaged in active play, which may be influenced by the school setting, which should be a safe and comfortable environment, as well as the teacher, who serves as a facilitator, or even the children themselves (Johnstone et al., 2018). These may be their motivation to engage in active games on the school's playing field (Tsuda et al., 2020).

According to reports from Pica (2014), the physical activity programme is implemented based on locomotor activities carried out for 60 minutes every day and is a

part of the school curriculum. It is taught directly by the teacher and can decrease preschoolers' sitting time while increasing students' basic locomotor movements, which are part of the FMS element. Studies have also found that vigorous play activities that last 40 minutes and are taught in schools have an impact on children's development of their fine and gross motor skills (Webster et al., 2019). With improved FMS outcomes, teachers frequently provide kids the chance to play on the playground as a physical activity intervention for around 45 minutes before entering the learning class (Van Capelle et al., 2017).

Contrary to what transpired in Indonesia, physical-motor learning activities are occasionally disregarded in early childhood education. Despite the existence of motor-physical activities, most teachers lack a solid understanding of how to conduct play activities that use motor-physical movements to promote FMS (Bakhtiar et al., 2020). When teachers provide physical motor learning on the playground, they believe that this activity is representative of the achievement of gross motor development of children because it is made based on daily lesson plans, seen from indicators of gross motor development in accordance with the stages of child development (Wea et al., 2021). They believe that by providing various game media facilities for children, becoming their partners in playing, and facilitating them can develop basic movements such as walking and trotting well, and train the children to have basic balance to develop their gross motor skills (Irna et al., 2022). Previous qualitative research also revealed that teachers' beliefs/ideologies, intentions, and awareness influence the way teachers facilitate the physical environment in PAUD rooms using game materials but this research does not describe the FMS results achieved by students (Nilsen, 2021). Although previous research has not revealed teachers' beliefs in presenting children's play activities to develop FMS. However, no research has yet been presented about the findings of FMS for early childhood that have included physical activity in the curriculum and shows that these results still conflict with teachers' beliefs. However, sometimes the result is that students do not have good FMS skills as expected by the teacher. As previous research revealed that the FMS of children in early childhood education in Indonesia is still low (Bakhtiar, 2014).

This study aimed to uncover misconceptions regarding teacher' expectations for enhancing FMS in young children, which are not just the consequence of playground games even though they have been included in the school curriculum as a regular activity in learning. The results of providing play activities incorporated into the school curriculum were investigated in this research by considering FMS data for children in early childhood education that have included children's physical motor learning activities in the school curriculum in Indonesia.

METHOD

Participant

This research involved preschool students from Raudatul Athfal (RA), one of Indonesia's early childhood education centers, which excels in several areas, including its educational programs, a significant number of extracurricular activities and serves as a model for fostering children's interests and abilities. Specifically, 12 boys and 18 girls served as the participants in this study. Before conducting the research, approval has been issued by the school and parents through the PSA (parent-student association) at the school.

Intervention

The outdoor physical play program at this school has been implemented since last year and is included in the school's curriculum program. The teachers' awareness of the importance of children's gross motor skills for holistic development sets the foundation

for the principal’s decision to publish guidelines for physical activity before classroom learning activities (Bautista et al., 2020). Every morning, all kids participate in this simple game in an open field for physical activity. Each morning, 60 minutes are set out for this physical activity, which is divided into two categories: structured physical activity and unstructured physical activity. Playing freely on the playground's swings, seesaws, slides, tire tunnels, and blocks can fill 30 minutes of unstructured time. Meanwhile, for structured exercises, 30 minutes of organized physical activity are offered. The teacher guides the students through simple movement games including running, jumping, and throwing. The structured physical activity games can be seen in Table 1.

Table 1. Structured Physical Activity Games Done Every Morning

FMS	Game
Running	In turns, students run past zigzag cones along $\pm 1.5\text{m}$. Every 10 minutes the cones are arranged in a variety of ways.
Balancing	Students walk past the balance beam $\pm 1.0\text{m}$ alternately in each group. In the 20th minute, the balance beams are put together so that they increase in length by $\pm 4.0\text{m}$.
Jumping	Students jump over obstacles in the form of cardboard alternately in each group. Every 10 minutes a variation of movement is given so that students can jump higher to pass through the cardboard as an obstacle.
Throwing and catching	Students alternately throw small plastic balls toward the target in the form of a basket. The target distance is added every 10 minutes. Every last 10 minutes the target is replaced with a friend to do throwing and catching activities using small or large plastic balls.
Coordinating	Students enter the tunnel by lining up lengthwise and crawling to be able to pass through the tunnel that has been provided.

This ex post facto study aimed to look at programs that had been implemented to see their impact based on previous theoretical studies which state that a variable causes changes in other variables (Matutes & Panoril, 2021). In this case, the children’s FMS was motivated by playing for 60 minutes with different types of activities, structured play activities for 30 minutes, and unstructured play activities for 30 minutes which were conducted every day before the learning process in class began. This intervention was carried out with students for 78 meetings starting from the 2022 school year in the odd semester until FMS data were collected.

Measurement

FMS was measured using the Test of Gross Motor Development-2 (TGMD-2) protocol developed by (Ulrich, 2000). The TGMD-2 was specifically designed and validated for use in the assessment of FMS between 3 and 10-year-old children (Ulrich, 2000). TGMD-2 measures the competence of 12 indicators of FMS, six locomotor skills (running, horizontal jump, hopping, leaping, galloping, and sliding), and six object control skills (overhand throw, striking ball, kick, catch, underhand roll, and dribble). The data were collected by four students who volunteered in this study and had previously been trained by an expert in conducting TGMD-2 for one week. The measurement using TGMD-2 was performed on a school field with children in small groups of two to four people, led by two field examiners. The first examiner was responsible for providing verbal descriptions and conducting demonstrations of required skills, while the second examiner recorded each experiment using a tripod-mounted video camera. The two other examiners served as supervisors in general in the implementation of this test. If a child did not understand the task they were asked to complete (e.g., they ran in the wrong direction), a further verbal description and demonstration of the skill was given and they repeated the experiment until they displayed the appropriate movement instructions.

Statistical Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0. All data were checked for normality before being analyzed. Descriptive and inferential statistics were performed with a significance of $p < 0.05$ and an independent T-test was used to determine the proportion of skill components performed according to gender.

RESULTS AND DISCUSSION

A total of 30 children participated in this study with the majority of children's FMS scores concentrated at < 70 . Looking at the two main components of FMS, girls showed higher locomotor and manipulative skills scores than boys compared to girls with an average score of \pm s.d. (57 ± 8.16 vs 46.6 ± 9.48). For locomotor skills, girls scored much higher than boys in run, hop, and horizontal jump (Table 3). In contrast, for manipulative skills, boys were significantly higher than girls in terms of striking balls and kicking. In addition, both boys and girls had similar scores in the other skills and their overall FMS skills were in the very poor category with an average score of < 70 (Table 2).

Table 2. Result of FMS per Category

Characteristic	n (%)	Mean (SD)			p-value
		Overall	Boy	Girl	
FMS Score					
< 70 (Very Poor)	29 (99%)	50.77	57	46.6	
70-79 (Poor)	1 (1%)				
80-89 (Below Average)	0				
90-110 (average)	0				
110-120 (Above average)	0				
121-130 (Superior)	0				
>130 (Very Superior)	0				
Locomotor score		26.1	29.5	23.8	0.003
Manipulative score		24.7	27.5	22.7	0.000

TGMD's FMS score (Ulrich, 2000)

According to the overall FMS skills displayed by both boys and girls, all of them had very poor skills in both the locomotor and manipulative aspects of the movement. Evidenced by the p -value < 0.005 on the locomotor aspects of the hop $p = 0.001$ and leaping indicators $p = 0.003$. That is, in these two indicators there is no significant difference between boys and girls. Meanwhile, in the manipulative aspect, the Striking ball $p = 0.000$ and kick $p = 0.001$, indicators show no significant difference. However, there were some differences in the locomotor aspects of the hop and leaping indicators, which turned out to be higher in the girls' group than in the boys. Meanwhile, in the aspect of manipulative indicators, striking ball, and kicking, the boys were superior to the girls.

Table 3. Result of the FMS Indicator

Skill	Mean (SD)		p-value
	Boys (n=12)	Girls (n=18)	
Locomotor			
Run	4.8 (1.26)	3.9 (1.13)	0.000
Gallop	5.1 (1.16)	3.2 (1.76)	0.098
Hop	5.7 (1.05)	5.1 (0.87)	0.001
Horizontal jump	4.8 (1.40)	4.5 (1.04)	0.561
Leaping	4.2 (1.33)	2.7 (1.13)	0.003
Slide	4.8 (1.02)	4.5 (1.29)	0.670
Manipulative			
Catch	3.9 (0.66)	3.1 (1.04)	0.061

Skill	Mean (SD)		p-value
	Boys (n=12)	Girls (n=18)	
Striking ball	5.4 (1.37)	4.6 (1.53)	0.000
Kick	5.5 (1.24)	4.6 (1.24)	0.001
Overhand throw	3.3 (1.30)	3.0 (1.23)	0.349
Roll	5.2 (0.86)	4.7 (0.94)	0.088
Dribble	4.1 (1.37)	2.6 (1.46)	0.093

Sig. $p < 0.005$

All of the children who participated in this study had very poor FMS, which is in contrast to the findings of earlier studies conducted in numerous developed countries (Bakhtiar, 2014). This is directly counter to what most early childhood educators in Indonesia believe, which is that structured or unstructured playground play can have an impact on children's FMS (Utoyo et al., 2020). Similarly, some studies conducted in developed countries have found that the introduction of structured and unstructured play to pre-schoolers have a positive effect on the development of their FMS (Foulkes et al., 2015; Jones et al., 2020; Tan et al., 2020). Previous research showed that a 6-week active play intervention that was part of structured play for preschoolers had an impact on both boys' and girls' FMS (Foulkes et al., 2017). Additionally, both structured and unstructured activities played by preschoolers were said to have a good effect on the growth of the FMS, particularly in the case of kids with weak motor skills (Tan et al., 2020). The majority of these interventions were conducted under the direct supervision of specialists or classroom teachers who had previously undergone specialized training on intervention protocols for the motor development of young children (Brian et al., 2016; Goodway & Branta, 2003; Tsuda et al., 2020).

To enhance early childhood FMS, interventions in the form of organized play and free play in the school playground area cannot be completed, even for a lengthy period, without consideration of the treatment's technique and content (Costello & Warne, 2020). Many interventions that can improve early childhood FMS have been validated by experts or given through a special agency tasked with developing them (Robinson et al., 2016). For example, in the UK, the Sport and Leisure Directorate of Liverpool City Council has created an Active Play program that aims to increase early childhood physical activity and early childhood FMS competence. The program includes professional development for classroom teachers, Active Play resources (experts) in schools, and post-program support (Foulkes et al., 2017). Even though the physical activity program to improve early childhood FMS is part of the early childhood education curriculum, it must adhere to the protocol to do so, as it is done in the UK with a play-based curriculum that involves experts to validate the treatment program (Wainwright et al., 2020).

There are several factors that can explain the very poor children's FMS even though structured and unstructured play activities have been included in the school curriculum and done for 60 minutes every day before entering class. First, the fact that the activities were not supervised by an expert; second, the existing facilities and infrastructure in the school environment; third, parental support for the importance of FMS for children's holistic development.

Structured and unstructured play interventions accompanied by experts

Interventions to improve early childhood FMS through SKIP (Successful Kinesthetic Instruction for Preschoolers) should be conducted by class leaders and teachers who assist in the activity process (Brian et al., 2016). These leaders are university-based specialists in motor skills or physical education. Before beginning an intervention program, class teachers in early childhood education receive training before intervention

and continued assistance during the delivery of the protocol for the intervention program. The teacher receives all the information necessary for implementing the early childhood motor development curriculum program, including lesson plans, video modules, task analyses, and the theory and principles of physical education and motor development (Mulvey et al., 2020). As a result, several studies have been successful to develop FMS in early childhood by measuring it using TGMD-2 and TGMD-3 (Altunsöz & Goodway, 2015; Lindsay et al., 2020; Mulvey et al., 2020).

Although all children participate in free play activities with their own preferences and pleasures, there must still be adult supervision, in this case, the teacher (Tan et al., 2020). This involvement is usually related to the safety and prevention of injuries to children when playing freely on the playground (Storli & Sandseter, 2019). In the playground's free-play activities, the teacher has an essential role to play. However, the role of the teacher as a leader is most disliked by children while the role of a manager or merely a spectator is most preferred during free play on the playground or the school field (Ivrendi, 2017). In addition to the teacher's role in playground free play activities, they must also match the activities to the early childhood education curriculum. Teachers must overcome these obstacles and hurdles to holistically encourage students' development, which is not an easy task (Ma et al., 2021). Studies have found that teachers experience challenges and difficulties rooted in a lack of understanding of empirically validated pedagogical foundations and appropriate policies between learning and play, including positioning their role in a structured and unstructured play (Fesseha & Pyle, 2016).

Facilities and infrastructure in the school

In order to promote early childhood motor development, it is necessary to set up areas and use tools as supporting elements while using playgrounds or outdoor fields for children's play. Slides, seesaws, tires, and play sand are common free play items in early childhood education (Engelen et al., 2013). It has been demonstrated that the playground area, which is used to promote the basic motor development of students in early childhood education, increases children's FMS when teachers, with training from experts on students' motor development, directly intervene (Johnstone et al., 2018).

In addition to supporting children's motoric development, facilities and infrastructures in early childhood education are also correlated with the risk level of child injury (Spencer et al., 2016). This means that in the daily practice of teaching in early childhood education, risks regarding the safety and injury of children when playing freely in the playground area can be managed and regulated by the teacher. The form of control that can be done should be in the form of direct and indirect involvement in children's play activities in the school playground area (Battaglia et al., 2019). During structured play where the scenario is clear, the teacher supervises and acts as a leader to give direct instructions, whereas, during unstructured games or free play, the teacher is not directly involved and only supervises, provides motivation, and encourages additional responses and actions for kids who are playing (Martens & Molitor, 2020).

According to research findings, children's activities are more focused on a structured environment. The playground environment in schools also encourages children to develop creativity and problem-solving skills when playing (Ozturk & Ozer, 2021). On the other hand, when a playground or open field for kids in early childhood education is inadequate, teachers will find it difficult to promote kids' motor development. Children can play various games more effectively in a flexible play environment, which helps to promote their development and improves their ability to express themselves (Jayasuriya et al., 2016).

Parents' support for their children's FMS

According to research, parents' attitudes toward outdoor play activities as a deciding factor for a child's overall development, including the development of FMS, are related to their culture's views on the value of the free play experience on the field to support motor development and other developments (Mart, 2021). Because parents occasionally can influence a teacher's judgment on the selection of outdoor/playground activities that children must attend, parents' perspectives and attitudes have a significant impact on the participation of children in outdoor activities (Vandermaas-Peeler et al., 2019). In this situation, parents play a crucial role in giving kids an opportunity to spend time outside the home and school. In order to stimulate their motor development, parents can take their kids outside to engage in physical exercise regardless of the weather or other environmental factors, as well as give them the freedom to explore and take risks (Allin et al., 2014).

The most significant early childhood development and growth promotion should be carried out by parents with the assistance of school teachers. Similar rules apply to the duty to encourage children to engage in active outdoor play (Catalano, 2018). However, it all depends on how parents interpret the value of unstructured outdoor play, which will encourage their kids' motor development. When they recognize the value of both structured and unstructured play for children's entire development, including FMS, they will actively participate in and value each child's play activity (Sando & Mehus, 2021). A study done with parents in the US and Denmark found that the majority, if not all parents value physical activities that their kids engage in outside the home or in playgrounds, such as simple walking, running, chasing, throwing a ball, and leaping around. They believe that these activities are all great for their kids' motor development.

These three factors are believed to be able to reveal the reasons behind this study's findings. This research observed and utilized instruments in a natural learning atmosphere carried out by early childhood education class teachers, which indeed is still doubtful to be able to improve children's FMS skills (Lindsay et al., 2020), without any intervention by an FMS expert or physical education expert even if they only spent 30 minutes in each meeting session (Tsuda et al., 2020). Additionally, this research sample was not indicative of children's FMS across West Java or even Indonesia. In order to generalize the research findings, a larger sample is required. The background of the research sample was not taken into account, including how frequently their parents engaged in outdoor play activities with them at home. Parents should be aware of the value of outdoor physical activity for kids (Colliver et al., 2022), and support school programs to stimulate their kids' FMS (Jayasuriya et al., 2016). These limitations can be a reference for further research to provide structured or unstructured play programs at the early childhood education level with the intervention of experts in the field of FMS or physical education so that they can develop the students' FMS (Brian et al., 2017). Furthermore, it is also necessary to disclose environmental factors and physical activities carried out with parents at home. The involvement of FMS experts or physical education is also needed to ensure the optimal legitimacy of the FMS implementation and evaluation program.

CONCLUSION

When compared to the categories in the instrument used, specifically in the locomotor and manipulative components of movement, the participants' FMSs in this study were in a very poor category. This study's findings raise questions concerning the development of FMS, which is crucial for children's holistic growth. Therefore, they can serve as a consideration for policymakers in early childhood education to pay attention to free play

programs and structured play for they should be accompanied by FMS or physical education experts so that the programs included in the early childhood education curriculum are validated properly. This is vital to ensure that the programs can improve children's FMS in accordance with Developmentally Appropriate Practice (DAP) and support their growth and development optimally through outdoor physical activity games carried out in a structured or unstructured manner for early childhood education.

ACKNOWLEDGEMENTS

We express our appreciation to the research participants in early childhood education, whose willingness to share their experiences and insights greatly enriched the depth and relevance of our findings.

CONFLICT OF INTEREST

There is no conflict interest in this research.

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