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Basic movement skills profile for early childhood motor development

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Abstract

This study aims to determine the profile of basic motion skills and motor development of early childhood aged 4-6 years. This study will focus on collecting data related to basic early childhood movement skills, taking into account various aspects that affect motor development. Research using descriptive quantitative methods. The population in this study were children who were at the age of 4-6 years in kindergarten (TK) in the city of Palembang. The sample used a random sampling technique with a total of 60 children. Collection using tests, observations, and interviews. The research instrument used the Test of Gross Motor Development-2. Data analysis uses quantitative analysis and descriptive analysis. The results showed that TK Negeri 4 Pembina had the highest average score in the category of very good 31.25% and good 37.92%, showing good motor skills in the majority of children. TK Harapan Bangsa 3 recorded the highest score in The Good category of 45.42% but low in the very good category of 25.83%. TK Gita Wijaya has the highest score in the category of enough 25.00% and less than 5.00%, indicating the need for more attention to the development of children's motor skills. Research in three kindergartens in Palembang shows the majority of children have good motor skills, especially in skills such as balanced walking and sprinting.Further research suggestions could be to put together structured exercise programs and training for educators to optimally improve children's motor skills.

Keywords: basic motion; motor development; early childhood

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INTRODUCTION

Motor development in early childhood is one of the important indicators in the overall growth and development process of children. The early age period, which covers the age range of 0 to 6 years, is a golden age in the formation of physical, cognitive, and social abilities (Zheng et al., 2022). At this time, children begin to develop basic motor skills which include simple movements such as walking, running, jumping, to movements that require complex coordination such as throwing and catching (Aliriad et al., 2023). These skills not only support daily activities but also form the foundation for future sports skills and physical activities.

Studies show that optimal motor development plays an important role in supporting children's cognitive function (Harini & Zenab, 2023). Research indicates a link between regular physical activity and improved concentration, self-control, and social interaction (Anggraeni et al., 2024; Yulia, 2024). However, on the other hand, children who experience delays in motor development tend to show lower levels of self-confidence, are less involved in physical

activities, and have a higher risk of health problems such as obesity and posture problems. The environment in which a child grows up also has a major influence on the development of basic motor skills.

Children who live in areas with limited access to open spaces or play facilities often have lower opportunities to develop their motor skills optimally. Parenting patterns that are less supportive of physical activity, such as excessive use of gadgets, are also significant risk factors (Yudaparmita, 2022). Children aged 4-6 years are in a phase of very rapid brain development. The first five years of life are an important period in which the development of brain nerve cells reaches 50%(Costa et al., 2021; Kwon et al., 2022). At this age, brain nerve cells develop to reach billions, which is the basis for the child's physical, intellectual, social, and emotional development. This period is often referred to as the golden age because it is a critical period to support optimal child growth and development (Wijayaningsih, 2023). To achieve ideal development, children need not only balanced nutritional intake, but also appropriate stimulation, including through physical activity

Physical activity plays a significant role in supporting the growth and development of early childhood. Through structured physical activities, children can develop physical, mental, and emotional abilities in a balanced manner (Harvianto & Bernisa, 2019). One form of effective physical activity is gymnastics, which not only helps motor development but also improves children's physical strength and basic motor skills. Research supports the importance of motor skills in gymnastics activities, where testing specific motor skills is an indicator of different physical strength abilities.

The principles of motor development in early childhood include physical and psychological changes that occur with growth. Children with better motor skills tend to be more easily involved in physical activities compared to children with less developed motor skills (Aliriad et al., 2024; Fadlan et al., 2023). Motor skills play an important role in supporting children's health and preventing obesity. Skills in psychology are divided into gross motor (large body movements) and fine motor (small movements and coordination). Children's motor development is the initial foundation for performing movement activities and training physical and mental balance. Children with good motor skills tend to be more confident, active, and develop physically, mentally, and socially.

The results of observations and interviews with researchers show that physical-motor learning in early childhood still faces various challenges. Activities designed to develop motor skills are often limited, such as joint gymnastics which is only carried out once a week. In the

implementation of this healthy and happy gymnastics, many children look confused when doing certain movements, such as walking on the spot, standing on one leg to train balance, or swinging their arms. In addition, the level of enthusiasm of children in doing rhythmic gymnastics movements is also relatively low. This situation shows that children's motor development is not optimal due to the lack of proper stimulation.

Motor development in early childhood includes progress in the child's physical ability to control body movements, which involves coordination between the nervous system, muscles and the whole body (Ibrahim & Elvira, 2024; Rachmaniar & Zanzabil, 2024). Motor development is divided into two main categories, namely gross motor and fine motor. Gross motor is related to skills that involve large muscles for activities such as running, jumping, and walking (Darmawati & Widyasari, 2022; Fitri et al., 2022). Meanwhile, fine motor skills emphasize more on skills using small muscles, such as grasping, writing, and manipulating small objects (Nurjani, 2019; Wandi & Mayar, 2019). Both aspects of motor development are very important to support children's various daily activities and the development of other skills (Prasetiyo et al., 2023).

Motor development in early childhood has a very important role in preparing children for various physical activities and more complex skills in the future. Basic motor skills in early childhood are an important foundation that will support the mastery of higher motor skills, such as sports or more complex physical activities (Biino, 2024; Tahmasebi et al., 2023). The ability to control the body and move smoothly greatly influences a child's cognitive, social, and emotional abilities, as well as supporting overall physical development.

Early childhood motor development can be divided into several stages, each of which has its own characteristics. In the early stages, which last from birth to one year of age, children rely on basic reflexes that appear in response to external stimuli. At the age of 2 to 6 years, children begin to develop more coordinated basic motor skills, such as running, jumping, and throwing, known as the early basic motor stage (Dike et al., 2023; Tristya, 2024). This stage is greatly influenced by stimulation from the surrounding environment, both from parents, educators, and peers. Furthermore, at the age of 7 to 12 years, children enter the fundamental movement stage, where mastered motor skills become more efficient and coordinated, allowing children to perform various physical activities more smoothly and complexly.

Early childhood education provides sufficient opportunities for children to develop basic motor skills through various interesting and varied physical activities. Activities such as children's gymnastics, motor games, and creative movement exploration can be effective means to hone children's motor skills (Biino et al., 2023; Kaioglou & Venetsanou, 2020). A

fun and safe environment will give children the confidence to experiment with various body movements, which in turn will help them develop motor skills optimally. Education that emphasizes the physical aspect also contributes to the balance of children's cognitive and emotional development.

Assessment of basic motor skills profiles plays an important role in measuring the level of a child's motor development and identifying potential needs for further intervention or support. Accurate measurement through observation or standardized tests, such as the Test of Gross Motor Development (TGMD-2), can provide a clear picture of the motor skills that a child has mastered, as well as areas that need more attention. Thus, educators and parents can design learning programs or physical activities that are more in line with the needs of the child's motor development. This structured assessment is also useful for determining the success of an early childhood education program in supporting their motor development.

This study will focus on collecting data related to basic motor skills of early childhood, by considering various aspects that influence motor development. This data is expected to provide a deeper understanding of the motor conditions of early childhood and become the basis for designing effective and evidence-based interventions. Based on the background of the problem above, the formulation of the problem in this study is how is the profile of basic motor skills of early childhood motor development in the city of Palembang. Solving research problems using a survey method on basic motor skills and motor development of early childhood (ages 4-6 years).

This study aims to identify the profile of basic motor skills and motor development of children aged 4-6 years. The urgency of the study lies in providing initial data in designing stimulation and learning to reduce the risk of injury. Early childhood motor development receives less attention than cognitive and literacy aspects, thus creating gaps in overall child growth and development support. The study also analyzes factors that influence motor development and provides recommendations for more effective interventions

METHOD

The type of research used in this study is descriptive quantitative research (Wijaya, 2019). This study aims to describe the variables related to the development of children's gross motor skills, using data in the form of numbers generated through direct measurement of children's basic motor skills.

The population in this study were children aged 4-6 years in Kindergarten (TK). The research sample was selected using a random sampling technique or simple random sampling,

which means that every child in TK has an equal opportunity to be selected as a respondent in this study. The sample taken amounted to 60 children, covering various characteristics of diverse early childhood. Random sample selection aims to minimize bias in subject selection, so that the results of the study can better describe the general conditions.

Data collection was conducted using three main techniques, namely tests, observations, and interviews. Tests were used to measure children's basic motor skills, especially those related to gross motor skills, such as running, jumping, and throwing. Observations were conducted to directly observe how children perform physical activities in unstructured situations, so that they can provide a more authentic picture of their motor skills. Interviews were conducted to obtain additional information related to children's physical habits at home or at school that may affect their motor development.

The instrument used in this study was the Test of Gross Motor Development-2 (TGMD-2), which is an assessment tool designed to assess the gross motor development of children aged 3 to 10 years (Gustian et al., 2024; Honrubia-Montesinos et al., 2021). TGMD-2 measures 12 basic motor skills divided into two main categories: locomotor skills and object control skills. The locomotor skills measured include running, fast walking, jumping, horizontal jumping, and sliding. Meanwhile, object control skills include hitting a stationary ball, dribbling a stationary ball, kicking a ball, catching a ball, throwing a ball with an overhand technique, and rolling a ball with the lower hand. This instrument has been proven valid and reliable in measuring children's gross motor skills, so it is very suitable for use in this study to measure the basic motor skills of children aged 4-6 years.

Data analysis uses two data analysis techniques, namely quantitative analysis and descriptive analysis. Quantitative analysis is carried out to process data in the form of numbers obtained from the results of children's basic motor skills tests. This data is then processed using descriptive statistics, which will describe the distribution of children's motor skills in various measured variables. In addition, descriptive analysis is used to provide a more comprehensive picture of the condition of children's motor development, by emphasizing the factors that influence the results of these measurements)

RESULT

This study aims to provide an overview of the level of basic motor skills of early childhood in three Kindergartens (TK), namely TK Negeri 4 Pembina, TK Harapan Bangsa 3, and TK Gita Wijaya, using the TGMD-2 test. Data analysis was carried out by grouping the test results into four categories: Very Good, Good, Sufficient, and Less. The results showed

that the majority of children in the three schools had good motor skills, although there were some areas that needed special attention for further development.

Table 1. TGMD-2 Test at State Kindergarten 4 Pembina

Test Items	Very good (%)	Good (%)	Enough (%)	Not enough (%)
Run fast	30.0%	40.0%	20.0%	10.0%
Long jump	25.0%	35.0%	25.0%	15.0%
One Leg Jump	30.0%	40.0%	15.0%	15.0%
Throwing the Ball	35.0%	30.0%	25.0%	10.0%
Catching the Ball	40.0%	35.0%	15.0%	10.0%
Balanced Walking	25.0%	45.0%	20.0%	10.0%
Dribble	30.0%	35.0%	25.0%	10.0%
Hitting the Ball	30.0%	40.0%	20.0%	10.0%
Crawling	35.0%	35.0%	20.0%	10.0%
Landing a Jump	40.0%	30.0%	20.0%	10.0%
Pedaling Feet	25.0%	40.0%	25.0%	10.0%
Zig-Zag Running	30.0%	40.0%	20.0%	10.0%

The TGMD-2 test in table 1 shows that the majority of children in TK Negeri 4 Pembina show motor skills in the Good category. The highest percentage in the Good category is seen in the Balanced Walking (45%) and Long Jump (40%) items. In addition, the Very Good category is also quite prominent in several skills such as Catching the Ball (40%) and Throwing the Ball (35%), which shows quite high motor skills in certain groups of children. However, there are several skills that require more attention, such as One-Leg Jump (Enough 30%) and Sprint (Less than 15%), which indicates the need for additional training to improve children's motor skills in these skills.

Table 2. TGMD-2 Test at Harapan Bangsa 3 Kindergarten

Test Items	Very good (%)	Good (%)	Enough (%)	Not enough (%)
Run fast	25.0%	45.0%	20.0%	10.0%
Long jump	20.0%	50.0%	20.0%	10.0%
One Leg Jump	25.0%	40.0%	25.0%	10.0%
Throwing the Ball	30.0%	35.0%	25.0%	10.0%
Catching the Ball	35.0%	30.0%	25.0%	10.0%
Balanced Walking	20.0%	50.0%	20.0%	10.0%
Dribble	25.0%	45.0%	20.0%	10.0%
Hitting the Ball	30.0%	40.0%	20.0%	10.0%
Crawling	25.0%	45.0%	20.0%	10.0%
Landing a Jump	30.0%	40.0%	20.0%	10.0%
Pedaling Feet	25.0%	45.0%	20.0%	10.0%
Zig-Zag Running	25.0%	45.0%	20.0%	10.0%

TGMD-2 test in table 2, most children are in the Good category, with the highest percentage in the Long Jump (50%) and Balanced Walking (50%) items. The Very Good category appears in several items, such as Catching a Ball (35%) and Throwing a Ball (30%),

which indicates higher motor potential in certain children. However, in the One-Leg Jump and Sprint items, the percentage of the Sufficient and Less categories are 25% and 15% respectively, indicating that these skills require more attention in their development.

Table 3. TGMD-2 Test at Gita Wijaya Kindergarten

Test Items	Very good (%)	Good (%)	Enough (%)	Not enough (%)
Run fast	20.0%	50.0%	25.0%	5.0%
Long jump	15.0%	55.0%	25.0%	5.0%
One Leg Jump	20.0%	45.0%	25.0%	10.0%
Throwing the Ball	25.0%	40.0%	30.0%	5.0%
Catching the Ball	30.0%	40.0%	25.0%	5.0%
Balanced Walking	20.0%	50.0%	25.0%	5.0%
Dribble	20.0%	50.0%	25.0%	5.0%
Hitting the Ball	25.0%	40.0%	30.0%	5.0%
Crawling	25.0%	45.0%	25.0%	5.0%
Landing a Jump	30.0%	40.0%	25.0%	5.0%
Pedaling Feet	20.0%	50.0%	25.0%	5.0%
Zig-Zag Running	20.0%	50.0%	25.0%	5.0%

TGMD-2 test in table 3, the majority of children are in the Good category, with prominent items such as Long Jump (55%) and Sprint (50%), indicating that these basic skills are quite mastered by most children. However, there are several items that still need to be developed, such as One Leg Jump (Sufficient 25% and Less 10%) and Pedaling (Sufficient 30% and Less 10%).

Table 4. Comparison Table of TGMD-2 Test Results

School name	Very good (%)	Good (%)	Enough (%)	Not enough (%)
Kindergarten 4 Pembina	31.25%	37.92%	20.00%	10.00%
Kindergarten Harapan Bangsa 3	25.83%	45.42%	19.58%	10.00%
Gita Wijaya Kindergarten	22.08%	44.58%	25.00%	5.00%

Comparison of TGMD-2 Test Results in Table 4, shows that TK Negeri 4 Pembina has the highest average score in the Very Good category with a percentage of 31.25% and the Good category with a percentage of 37.92%. This shows that the majority of children in TK Negeri 4 Pembina have good and fairly good motor skills, with many children reaching the Very Good category. On the other hand, TK Harapan Bangsa 3 has the highest average score in the Good category with a percentage of 45.42%, but has the lowest average score in the Very Good category, which is 25.83%. This shows that although the majority of children are in the Good category, only a small number reach the Very Good category. Meanwhile, TK Gita Wijaya recorded the highest average score in the Sufficient category with a percentage of 25.00% and in the Less category with a percentage of 5.00%. This shows that most children in TK Gita

Wijaya are in the Sufficient category, with a few children in the Less category, which indicates the need for more attention to the development of their motor skills.

DISCUSSION

Based on the results of the percentage analysis on the 12 TGMD-2 test items, it was found that in general the majority of children were in the Good category with the highest average percentage in almost all test items. For example, the Balanced Walking item had the highest Good percentage of 48.3%, indicating that most children were able to do this activity well. The Very Good category also had a significant contribution, especially in items such as Catching a Ball (35.0%) and Landing a Jump (31.7%). This indicates that certain motor skills, such as catching and landing stably, are relatively more mastered by children. The Sufficient category indicates that there is room for development in motor skills such as Pedaling (25.0%) and Sprinting (21.7%). In addition, the Less category appeared especially in items such as One-Leg Jump (11.7%) and Long Jump (10.0%), indicating that some children need special intervention or training to improve these skills. Overall, these results indicate that the motor development of early childhood in the three schools is already at a good level, but still requires further motor development programs, especially for items that have low scores in the Less and Sufficient categories, to ensure that each child can achieve optimal motor development.

Based on the results of the study, it can be seen that the majority of early childhood children in the three schools have shown good basic motor skills, with most of the abilities being in the Good category. These results are in accordance with the theory of early childhood motor development which states that gross motor skills in children develop through a gradual process and are influenced by various factors, such as age, physical experience, and stimulation from the surrounding environment (Aniyawati, 2024; Wijayaningsih, 2023). Factors that influence the motor development of early childhood include the physical experiences they gain through daily activities, as well as stimulation provided by educators and parents (Sriyanti & Zanki, 2024; Waspodo et al., 2024). Diverse and varied physical activity, as well as structured training, are essential for developing specific motor skills that are still weak.

The skills of One-Leg Jump and Foot Paddling, which showed a high percentage in the sufficient and less categories, require a more focused approach and more intensive training so that children can achieve more optimal motor development. Children's motor development is influenced by physical, social, and environmental aspects, which are more comprehensive and based on the child's specific needs (Ambarwati, 2024; Kavanagh et al., 2023). Motor development programs and specific skill strengthening can be a solution to help children develop their motor skills optimally (Gmamdya et al., 2023; Mashuri et al., 2022).

The results of direct observations in all three schools showed that children were more enthusiastic and able to participate in motor activities that were group and open games, such as catching and throwing a ball, compared to activities that demanded complex balance and coordination such as jumping on one leg or pedaling. Early childhood teachers interviewed also said that the limited means and time are obstacles in providing varied motor exercises. Some teachers reveal that the main focus of learning is still on cognitive aspects and literacy preparation, not Motor aspects.

Parents interviewed stated that children more often get unstructured physical activity at home, such as free play, and few engage in specific motor activities or directed sports. This reinforces the importance of the involvement of educational institutions in providing systematic motor training. Overall, although children in all three schools have a good motor foundation, the results of this study emphasize the need for further enrichment and training in specific motor skills. With a more structured and focused development program, it is hoped that children can achieve optimal motor development and acquire more diverse skills to support their overall physical and cognitive development.

CONCLUSIONS

Based on the results of a study conducted in three kindergartens in the city of Palembang (TK Negeri 4 Pembina, TK Harapan Bangsa 3, and TK Gita Wijaya) using the TGMD-2 test to measure basic motor skills of early childhood, it can be concluded that the majority of children show good motor skills. Most children are in the Good category in almost all test items, especially in basic motor skills such as Balanced Walking and Sprinting. However, there are several skills, such as One-Leg Jump and Pedaling, which show less than optimal results in some children, with a significant percentage in the Sufficient and Less categories. These findings indicate that although children have a good motoric foundation, there are still several motor skills that require further attention and training in order to achieve more optimal motor development. Suggestions for further research can add to the development of structured training programs that focus more on motor skills that still need improvement, such as One-Leg Jump and Pedaling. This training program must involve intensive and specific exercises that can strengthen children's motor skills. Continuous evaluation and monitoring of motor development programs is necessary to ensure the improvement of children's motor skills, as well as providing training for educators to improve their competence in designing motor programs that are appropriate to children's development.

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