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Preschool Age Fundamental Movement Skills Level

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Abstract

Background: Teachers and parents need to know and understand the importance of fulfilling motor skills in pre-school-aged children to develop these habits and help reduce the rate of decline associated with motor delays in children's gross motor development.
Objectives: This study aims to determine the level of fundamental movement skills of pre-school-age children at PAUD Tunas Bangsa in Bakalan Krajan, Malang City.
Methods: This non-experimental study utilizes a descriptive research design with a survey method as its approach. The participants in this study were 15 children aged 3-5 years old from PAUD Tunas Bangsa Bakalan Krajan in Malang City. This study is a population study because all subjects were included in the study. The instrument used to determine the basic movements of pre-school-age children uses TGMD-2 (Test of Gross Motor Development). This study analyzed data using a table of norms for the Test of Gross Motor Development (TGMD-2) and percentages.
Results: The study's final findings revealed that the level of fundamental movement or gross motor skills of children aged 3-5 years at PAUD Tunas Bangsa in Malang City showed an average Gross Motor Quotient (GMQ) score of 124, establishing them in the high category.
Conclusion: The level of fundamental movement skills of pre-school age children at PAUD Tunas Bangsa Bakalan Krajan in Malang City is in a good category, as evidenced by two measuring indicators, namely locomotor motion, and manipulative motion, so it can be said that children's gross motor skills develop by their level age.

Keywords: skill, fundamental movement, pre-school-age children, TGMD.

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INTRODUCTION

Pre-school age is an important foundation for a child's development in various aspects of growth and development. Movement and cognitive growth must always be stimulated appropriately during pre-school age because, at this phase, the child's condition is learning new things and mastering new types of motion. In order for children to get good cognitive development and motor skills, it must also be supported by good physical activity (Zeng et al., 2017). Children's participation in various physical activities such as running, jumping, and kicking can increase their physical activity, and the children can also achieve physical fitness at an adolescent level (Capio et al., 2015; Stodden et al., 2008). Children's motor skills may also have an impact on the development of emotional resilience and self-confidence (Farida, 2016). The child's physical development directly influences a child's ability to master movement variations. Children's motor development is important in supporting their strength because making various heavy or intense movements in daily life indirectly physically trains the child and helps improve its condition (Sepriadi, 2017).

Children with well-developed gross motor skills will gain numerous benefits, including increased ability to perform or comprehend movements that are considered difficult for a child. It is critical to begin mastering gross movements in pre-school because this is the foundation for future success. To perform basic concept movements using the fingers, eye-foot and eye-hand coordination, vision, and balance (Komaruzaman, 2018; Yul et al., 2018). Fundamental movement skills are a set of all movements. For example, children can learn to read and put words, prepositions, and suffixes together by understanding and recognizing letters to form sentences. By knowing the fundamental movements, children can also learn to move. The existence of a process of knowledge of basic movement skills by a child in pre-school age is very important because if the basic movement skills are not learned sufficiently, the child will have difficulties in performing and learning various other movements skills that are classified as more difficult in the future, for example, understanding of sports technical skills (sports skills) later (Chaves et al., 2015). Pre-school age is a critical period for acquiring basic movement skills, especially the ability to control an object, including kicking, catching, and throwing, as well as movement skills such as running, jumping, and bouncing (Mukherjee et al., 2017; Turner et al., 2010).

According to research, 13-18% of children in Indonesia, 24% in Thailand, 12-14% in the United States, and 22% in Argentina experience developmental problems, including gross motor delays (Hidayat, 2014). It reached 10.2% in East Java, which could decrease children's adaptive creativity (Adriani & Wirjatmadi, 2016). According to research conducted in East Java's urban areas, only 46.6 percent of children experience gross motor development by the age of three (Silviyana, 2020). Furthermore, previous research using the Denver Developmental Screening Test (DDST) data collection instrument revealed that children under the age of five with gross motor development have a correlation with the age of the child, so it is necessary to increase physical activity from an early age so that there are no obstacles in a child's gross motor development (Ananditha et al., 2021). The research in Palu with data collection techniques using four types of tests, namely: (1) jumping test without initial technique, (2) single leg stand test, (3) throwing ball test, and (4) running test, and the results showed that 45.3 percent of children in the entire sample had gross motor conditions that were in the intermediate category, so it can be said that it is still in the development stage and there is a need for improvements that can stimulate it more optimally (Humaedi et al., 2021). Several studies support the conclusion that the age of the first five years of gross motor development is more influential in influencing subsequent movement abilities (Suhartini, 2015).

According to the observation of PAUD Tunas Bangsa Bakalan Krajan in Malang City, there has never been a survey related to fundamental movement skills. This research aims to determine the level of basic movement skills possessed by pre-school-age children. As a result, researchers conducted data collection and research on fundamental movement skills of pre-school age children at PAUD Tunas Bangsa Bakalan Krajan in Malang City due to the importance of fundamental movement skills, particularly gross motor skills, in supporting the child development process at a later stage.

However, considering the results of analyzing articles that are nearly similar to this study, it is worth mentioning that this research still has its research novelty. Previous Silviyana and Anandita research contradicts this study (Ananditha et al., 2021; Silviyana, 2020). The difference is that this survey was conducted in Malang city, whereas the previous study was conducted in Palu city. The research area has an impact on the students' development conditions, as proven by the facilities received and the learning process of the PAUD children. The data collection tools used also differ. This study validated the Test of

Gross Motor Development-2 (TGMD-2) as a reliable, valid, and well-standardized assessment tool for measuring pre-school children's basic gross motor skills (Ulrich & Sanford, 2000). Meanwhile, previous research conducted by Anandhita (Ananditha et al., 2021) used the Denver Developmental Screening Test (DDST), and study conducted by Humaedi et al. (2021) used four types of tests, which technically, this research still has limited data found from the instruments used so that it requires a more detailed instrument refinement in measuring gross motor skills of pre-school-age children, and the focus of research is on the potential of gross motor skills in pre-school-age children, and factors - factors related to gross motor development. Meanwhile, this study presents the results of children's gross motor skills tests and focuses on the level of pre-school children's basic gross motor skills, including locomotor and manipulative (object control) movements, using the Test of Gross Motor Development-2 (TGMD). A more detailed instrument (Ulrich & Sanford, 2000) measures pre-school children's basic gross motor skill. The significance of this research is to provide teachers and parents with knowledge and awareness about motor skill fulfillment from an early age to develop this knowledge so that motor delays in children can be minimized for the application of an active lifestyle that aims to improve children's physical condition.

One is improving gross motor skills in pre-school-age children at PAUD Tunas Bangsa Bakalan Krajan in Malang City. In addition, children's ability to perform gross motor movements is important in supporting the development of other physical activities (Stodden et al., 2008). This research has the benefit of increasing parents' knowledge so that they care about the physical needs of their children. In addition, it also helps reduce the delay in children's gross motor development so that they can know the fundamental movement skills of pre-school age children. children aged (3-5 years) at the Tunas Bangsa Bakalan Krajan PAUD in the city of Malang.

METHOD

Study Design and Participants

This study is a non-experimental study that employs a descriptive research design with a survey method as its approach. This design is appropriate for this study to describe the results of a fundamental movement skills test performed on a pre-school-age child at PAUD Tunas Bangsa Bakalan Krajan in Malang City. This study used tests and measurements. The data presentation is done by the facts in the field. Object control was

not performed in this study because the purpose of this study was to review children's basic movement skills. Children are aged 3-5 years at PAUD Tunas Bangsa Bakalan Krajan Malang City were selected as the research population, which consisted of 15 children. Utilization of total sampling in sampling used in this study.

Research Instruments

Test of Gross Motor Development-2 (TGMD-2) is used as a measuring tool (Ulrich & Sanford, 2000). This test has two categories of motion, locomotor motion and manipulative motion (object control), with each category consisting of 6 skills. The total number of skills in this test is twelve. Running, jumping, gallop jumping, horizontal jumping, jumping over the ball, and sliding are examples of locomotor movements (side shifting). Throwing, catching, hitting, and kicking are examples of manipulative movements (object control). Data collection is carried out in June 2021.

Data Analysis

The data analysis technique used in this study is percentage descriptive statistics, as well as the norm reference assessment formula adopted from TGMD-2 (Ulrich & Sanford, 2000), which is divided into five categories: Very Superior (score > 130), Superior (score 121-130), Above Average (score 111-120), Average (score 90-110), Below Average (score 80-89), Poor (score 70-79), and Very Poor (score <70).

RESULTS

This study's data interpretation describes children's fundamental movement skills by categorizing them into two types of movement: manipulative (object control) and locomotor movements. Manipulative movements include hitting the ball, dribbling the ball, throwing the ball, catching the ball, kicking the ball, and rolling the ball. While locomotor movements include slide (shift sideways), horizontal jump (horizontal jump), hop (jump), leap (jump over the ball), gallop (jump gallop), and run. A more detailed explanation can be found here.

1. Level of Locomotor Movement of Pre-School-Age Children (3-5 years) at PAUD Tunas in Bakalan Krajan in Malang City

The results of the locomotor motion measurement test for pre-school children at PAUD Tunas Bangsa Bakalan Krajan in Malang City using TGMD-2, the results are presented in a percentage count shown in Table 1 and the bar chart in Figure 1.

Table 1. Results of the Locomotor Movement Level Test for Pre-School Age Children (3-5 years) at PAUD Tunas Bangsa in Bakalan Krajan in Malang City

No	Standard Score	Frequency	Percentage	Classification
1.	17-20	1	7%	Very Superior
2.	15-16	4	27%	Superior
3.	13-14	1	7%	Above Average
4.	8-12	9	60%	Average
5.	6-7	0	0%	Below Average
6.	4-5	0	0%	Poor
7.	1-3	0	0%	Very Poor
Total		15	100%	-

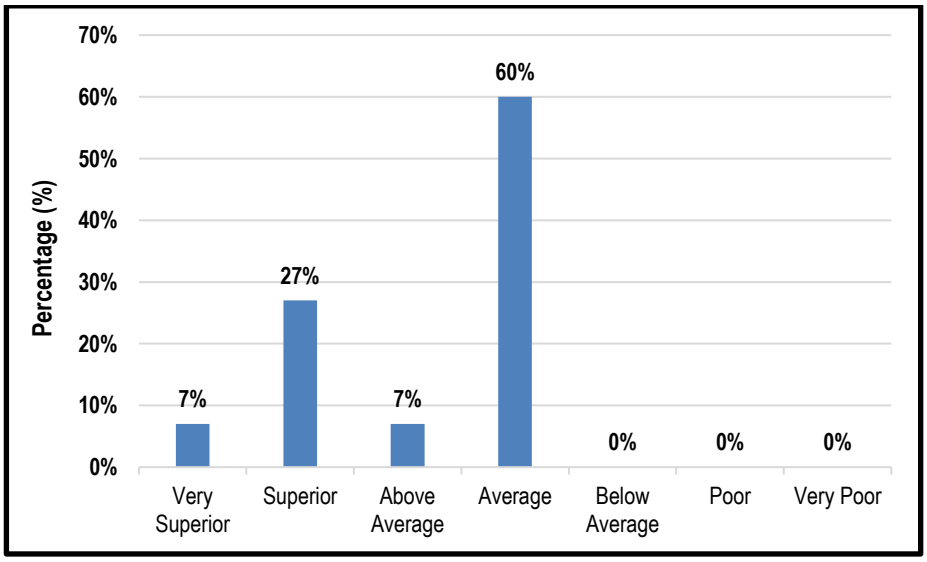

Figure 1. Locomotor Motion Diagram of Pre-school Age Children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang City

According to Table 1 and Figure 1, the results of the locomotor movement level test for pre-school children aged 3-5 years at PAUD Tunas Bangsa in Bakalan Krajan, Malang City with a sample of 15 children, the 7% result obtained by the locomotor movement of children is very superior, or 1 (one) child who receives a score of 17-20. Superior scores obtained a total of 27%, or 4 (four) children received a score of 15-16. Then 7% is obtained by a score higher than the average, or 1 (one) child receives a score of 13-14. Furthermore, the average score of 60% is obtained, or 9 (nine) children receive a score of 8-12. Finally, children with scores below the average, poor, and very poor did not exist or 0%.

2. Manipulative Movement Level of Pre-school Age Children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang City

The results of the manipulative motion measurement test for pre-school children at PAUD Tunas Bangsa Bakalan Krajan in Malang City using the TGMD-2 are shown in Table 2 and the bar chart in Figure 2.

Table 2. Results of the Manipulative Movement Level Test for Pre-School Age Children (3-5 years) at PAUD Tunas Bangsa in Bakalan Krajan, Malang City

No	Standard Score	Frequency	Percentage	Classification
1.	17-20	3	20%	Very Superior
2.	15-16	7	47%	Superior
3.	13-14	4	27%	Above Average
4.	8-12	1	7%	Average
5.	6-7	0	0%	Below Average
6.	4-5	0	0%	Poor
7.	1-3	0	0%	Very Poor
	Total	15	100%	-

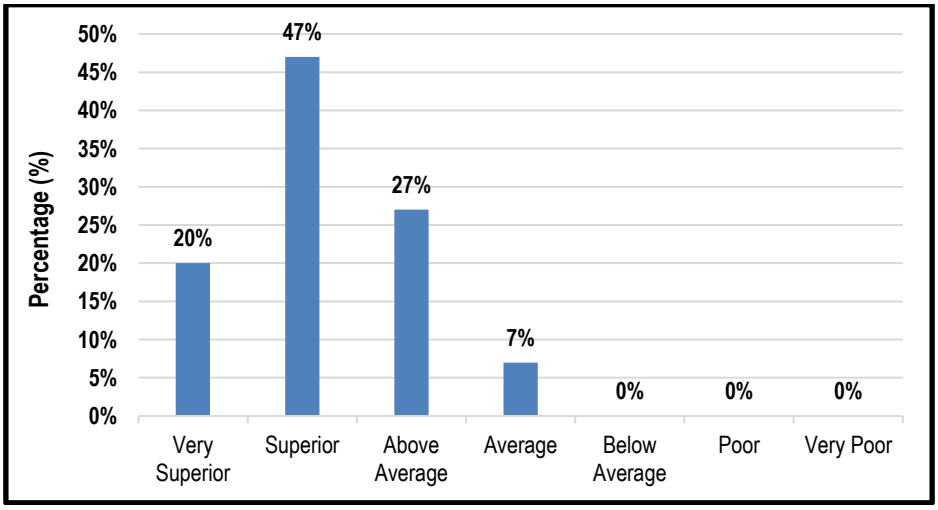

Figure 2. Manipulative Movement Diagram of Pre-school Age Children (3-5 years) at PAUD Tunas Bangsa in Bakalan Krajan, Malang City

Based on Table 2 and Figure 2, the results of the manipulative movement test results for pre-school aged children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang City with a sample of 15 children, it is known that the manipulative movements of children with very superior scores are 20% or 3 (three) children get a score of 17-20. Children with a superior score of 47% or 7 (seven) children get a score of 15-16. Children with scores above the average of 27% or 4 (four) children get a score of 13-14. Furthermore, 7% is obtained by the average score or 1 (one) child gets a score of 8-12. Finally, 0% or none were obtained by values below average, poor, and very poor.

3. Level of Fundamental Movement Skills for Pre-School Age Children (3-5 years) at PAUD Tunas Bangsa in Bakalan Krajan, Malang City

The results of the locomotor and manipulative motion measurement tests using TGMD-2 are presented in percentages in Table 3 and as a bar chart in Figure 3.

Table 3. Results of Tests for Fundamental Movement Skills for Pre-School Age Children (3-5 years) at PAUD Tunas in Bakalan Krajan, Malang City

No	Standard Score	Frequency	Percentage	Classification
1.	>130	5	33%	Very Superior
2.	121-130	4	27%	Superior
3.	111-120	3	20%	Above Average
4.	90-110	3	20%	Average
5.	80-89	0	0%	Below Average
6.	70-79	0	0%	Poor
7.	<70	0	0%	Very Poor
Total		15	100%	-

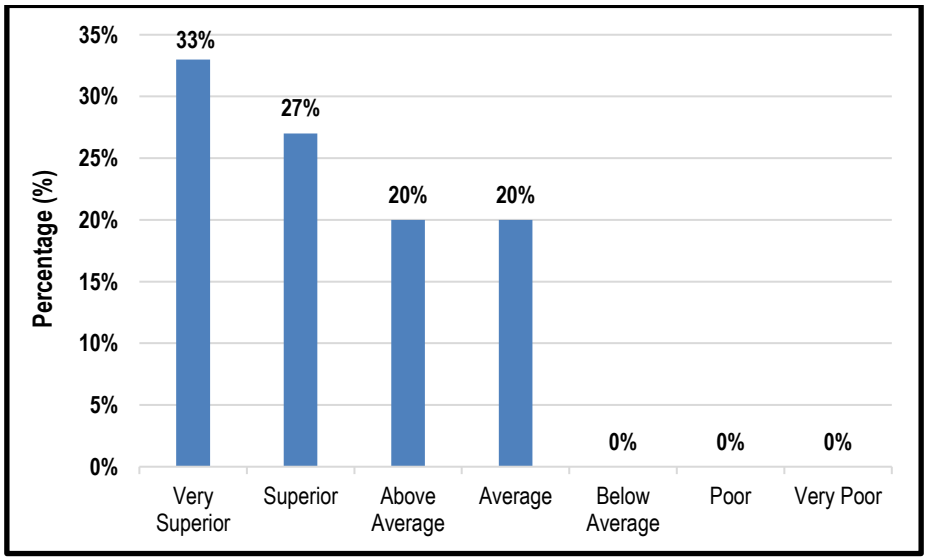

Figure 3. Diagram of Fundamental Movement Skills for Pre-School Age Children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang City

The test results for the level of fundamental movement skills of pre-school children (3-5 years old) in PAUD Tunas Bangsa Bakalan Krajan in the city of Malang with a sample of 15 children are shown in Table 3 and Diagram 3. Gross motor skills in children with very superior scores are known to be 33% or 5 (five) children with a score > 130. Children with a superior score of up to 27% or 4 (four) children receive a score of 121-130. Children with up to 20% above average results or 3 (three) children score 111-120 points. Children with an average score of 20% or 3 (three) children will receive a score of 90-10. There are no children with scores below average, poor and very poor or 0%.

4. Descriptive statistical analysis of the level of basic movement skills of pre-school children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang city

The findings of tests and measurements of locomotor and manipulative movements using TGMD-2 are provided in statistical calculations in Table 4.

Table 4. The results of Descriptive Statistical Analysis of Pre-School Age Children's Levels of Fundamental Movement Skills at PAUD Tunas Bangsa Bakalan Krajan in Malang City

Indicator	N	Minimum Score	Maximum Score	Average	SD
Locomotor Movement	15	9	18	13	2.62
Manipulative Movement	15	11	20	15	2.04
Gross Motor Quotient **(GMQ)**	15	100	148	124	12.82

SD = Standard Deviation, N = Number of Samples

According to Table 4, the analysis findings suggest that the average locomotor movement score is 13 with categories above the average. Meanwhile, the manipulative movement component is quite prominent, with an average score of 15 from the overall sample and falling into the high category. Overall, the findings of the level of fundamental motor abilities or gross motor skills observed from two measuring indicators, namely locomotor movement and manipulative movement, of pre-school children at PAUD Tunas Bangsa Bakalan Krajan in Malang City indicated a GMQ score of 124 in the high group.

DISCUSSION

The research examined the degree of fundamental motor abilities or gross motor skills of children using two measuring indicators, namely locomotor and manipulative movements. Locomotor movement is a motion that is defined by the movement of the body from one area to another. The locomotor movement exam in TGMD-2 assesses six skills: running, jumping, galop jump, horizontal jumping, jumping the ball, and sliding (shifting sideways). The results obtained from the first skill, namely running as a whole, showed an average score of results in a good category, where the scores obtained by each child almost entirely met the criteria. The second ability, namely jumping, indicates the average score of the good category results, and each child's overall score fulfills the assessment standards. The third skill is the gallop jump, in which the kid swiftly performs a three-beat walking action. The results demonstrate that only a small number of children score in the good category, some are in the average category, and the obstacle can be observed in the movement of the two legs that are less focused to jump and swing alternately. The fourth skill is a horizontal jump, in which the kid jumps horizontally from

a standing posture; the findings reveal an average score in the good category, with nearly all of the children receiving scores that fulfill the criterion. Furthermore, regarding the ability to jump the ball, the test results reveal an average score with a good category where the kid performs the movement correctly, and a small number of children attain the average category value. The last skill is sliding sideways (slides), which results in the excellent category, indicating that the child's general ability to make these movements passes the criteria.

The locomotor movement test for pre-school age children reveals that 9 (nine) children with a percentage of 60% have an average score with a standard range of 8-12. A small number of children achieved values in categories above the average. These findings show that most of the youngsters at PAUD Tunas Bangsa Bakalan Krajan have an average category of locomotor skills. The capacity of children to conduct locomotor movements demonstrates their independence of movement. A kid's locomotor movements can serve as a reference for their motor development, allowing the child's talents and skills to grow and develop by age.

While manipulative movements are movements that involve eye-foot and eye-hand coordination. This is due to the fact that manipulative motions necessitate the usage of other objects outside the body. Components of manipulative motion, one of which is the child's basic movement skills, where it is very important to develop, so that a child has more skills in performing movement tasks, and so that the child's development can run well and gain in-depth experience to train and practice skills of the motion. There are six abilities examined in the TGMD-2 manipulative motion test, which include hitting, throwing, catching, and kicking. The results of the first skill include hitting the ball with a plastic stick, which displays an average score in a good category, indicating that overall, the child can hit the object with the right body posture and movement according to the requirements. The second ability is dribbling the basketball with the dominant hand before catching the ball with both hands and without moving the feet, which results in an average score with an above-average category, where most children still do not achieve the movement criterion owing to poor eye-hand coordination, as a result, the hit is typically off-target and the ball's position is often out of control. The third talent is catching a plastic ball thrown from below, which received an average score in the very good category, this skill is the inverse of basketball dribbling, where the child's general eye-hand coordination

skills is very good at catching the ball. Then the fourth skill, kicking an unmoving ball with the preferred foot, has an average score in the very high category, indicating that the child's eye-foot coordination skills in kicking the ball is very strong overall, and the movement steps and object accuracy satisfy the standards. Furthermore, the fifth skill, namely the ability to throw the ball to a point with the preferred hand, has an average score in the very good category, indicating that most children can throw straight on target and a small number of children are less than optimal in throwing, culminating in less accurate throwing results. Finally, the sixth skill, the ability to roll the ball between two cones using the dominant or favored hand, shows an average score in the very high category, where most of the children can roll the ball according to the predefined goal and the child's total score exceeds criteria. The test results for all manipulative movements revealed that 7 (seven) children were in the high category, with a percentage of 47%. A small number of youngsters achieved the average value. These findings show that the children of PAUD Tunas Bangsa Bakalan Krajan have mastered manipulative movement skills well. Manipulative movements are very appropriate when developed in early childhood because at an early age child are still in a very active stage, but the basic manipulative movement skills in each child are different, the development of basic movements requires a long process to be able to perform movements perfectly (Hendra & Putra, 2019).

According to the fundamental movement skills diagram in (Figure 3), it can be seen that the overall results of the basic gross motor skill level of children based on the TGMD-2 test reveal that 5 (five) children, or up to 33%, are in the very superior score category, while others are in the high category and above average.According to these findings, children's overall level of gross motor abilities is very good, and they already have manipulative and basic locomotor skills according to their developmental age.

There are a variety of elements that can impact the development of a child's gross motor abilities in early childhood, particularly at the pre-school age, such as nutritional status and the environment (Meylia et al., 2020; Rhomadona, 2020). One of the examples, when there are toys around and children see them, they will tend to move more and develop their motor skills (Lisa et al., 2020). There is a study in a city in East Java which states that the development of children aged 3-5 years has a very high correlation with nutritional status, which can be determined by looking at weight and height (Alfarizi & Suarni, 2015). Furthermore, geographical location and gender can influence variances in

the level of movement abilities of children at pre-school age (Goodway, 2010). According to the findings of the study, the basic gross motor skills of pre-school children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang City were in the high category, when viewed from the process of growth and development of children at pre-school age, the results are appropriate, where children have started to be able to stand on one leg, jump at a certain height, throw well, catch something correctly, and kick something in a direction (Saripudin, 2019).

When the results of this study were compared to prior research by Humaedi (Humaedi et al., 2021), the percentage results of gross motor abilities were substantially different. Previous study on gross motor conditions found that the number of children in the medium category was 45.3%, and the percentage of children in the very high score category was just 8.7%. While the overall findings in this study showed that 33% of children were in the very high value category, only 20% of children were in the medium or above average category. The effect of the differences found from the findings of the percentage and category of norms can be seen from the instruments used, which in prior studies had limited data found from the instruments used, whereas this study used more detailed test instruments in measuring basic gross motor skills of children aged pre-school. Furthermore, the Test of Gross Motor Development (TGMD-2) contains reference criteria and norms and has been validated as a reliable and well-standardized assessment instrument for measuring pre-school children's gross motor abilities (Ulrich & Sanford, 2000).

However, there are still some children with gross motor development in the average category. There are differences in the pace of development across children, thus there are no analogies in terms of physical growth and motor development between two or more individuals. Nerve and muscle maturation affects a children's motor development, because if it is immature nerves and muscles make it difficult for the youngster to display specific abilities (Ulfah & Putra, 2021). Exercise on gross motor skills is very important to do to control body movements effectively which involves movement in training the coordination of the senses with the limbs, coordination between hands and eyes, training readiness for activities, training self-confidence, training concentration, courage, balance, muscle strength and flexibility (Kusumaningtyas, 2016).

The findings of this study are intended to provide an overview to PAUD teachers that the level of basic movement skills or gross motor skills of PAUD Tunas Bangsa Bakalan Krajan children in Malang City is generally in the high category, so that it can be used as a reference or comparison in preparing learning plans that do not consider how important motor movement is. Teachers can also utilize the findings of this study to assess children's basic gross motor abilities on a regular basis in order to determine further treatment if there are discrepancies in outcomes.

Understanding the importance of gross motor skills for children at an early age, especially at pre-school age, should be a concern for PAUD teachers in every school by encouraging gross motor skills in children using various different learning methods such as applying the use of traditional games (engklek), games through the media of hula hoops, small ball games, and outbound games (Novitasari et al., 2019; Nur & Mulyana, 2017; Ramdani & Azizah, 2019; Wiranti et al., 2018).

CONCLUSION

The findings of this study suggest that the level of basic gross motor skills of pre-school-aged children (3-5 years) at PAUD Tunas Bangsa Bakalan Krajan in Malang City has gross motor skills in the high category by showing a GMQ score of 124. This is observable from two measuring indicators, namely manipulative and locomotor movements. This study found that, in general, the level of basic gross motor skills of pre-school children at PAUD Tunas Bangsa Bakalan Krajan in Malang City was in a good category, so it can be said that basic motor skills or gross motor skills of children develop according to age level.

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CONFLICT OF INTEREST

The author hereby declares that this research is free from conflicts of interest with any party.

AUTHOR'S CONTRIBUTION

Ludyana contributed to preparing concepts, formulating methods, and conducting research. Hariadi and Fadhli contributed to the writing, processing the results, interpreting, drawing conclusions, and editing the final version.

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