

Profile of Manipulative Movement Abilities in Children Aged 4–5 Years at Ummi An-Nisa Early Childhood Education Centre

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ABSTRACT

Manipulative motor skills are part of early childhood gross motor development related to a child's ability to move and control objects using eye-hand coordination. This skill is important because it often appears in everyday play activities, such as throwing and catching a ball. This study aims to determine the description of manipulative motor skills in 4–5-year-old children at Ummi An-Nisa Early Childhood Education Centre. This study used a descriptive quantitative approach with 12 children aged 4–5 years as research subjects. Data were collected through observation using a manipulative movement ability test instrument that included indicators of body position, movement coordination, object control, and balance in throwing and catching a ball. The data obtained were then analysed descriptively to determine the children's ability level for each indicator. The results showed that most children had moderate to good manipulative movement skills. However, the children's abilities still varied across each indicator. Ball catching skills showed better results than throwing skills, especially in terms of movement coordination and object control. Based on these results, it can be concluded that the manipulative motor skills of 4-5-year-old children at PAUD Ummi An-Nisa have developed quite well, but still need to be improved through motor learning activities that are appropriate to the characteristics and developmental stages of children.

ABSTRACT

Kemampuan gerak manipulatif merupakan bagian dari perkembangan motorik kasar anak usia dini yang berkaitan dengan kemampuan anak dalam menggerakkan dan mengontrol benda menggunakan koordinasi mata dan tangan. Kemampuan ini penting karena sering muncul dalam aktivitas bermain sehari-hari, seperti melempar dan menangkap bola. Penelitian ini bertujuan untuk mengetahui gambaran kemampuan gerak manipulatif anak usia 4–5 tahun di PAUD Ummi An-Nisa. Penelitian ini menggunakan pendekatan kuantitatif deskriptif dengan subjek penelitian sebanyak 12 anak usia 4–5 tahun. Data dikumpulkan melalui observasi menggunakan instrumen tes kemampuan gerak manipulatif yang meliputi indikator posisi tubuh, koordinasi gerak, kontrol objek, dan keseimbangan pada kegiatan melempar dan menangkap bola. Data yang diperoleh kemudian dianalisis secara deskriptif untuk melihat tingkat kemampuan anak pada setiap indikator. Hasil penelitian menunjukkan bahwa sebagian besar anak memiliki kemampuan gerak manipulatif pada kategori sedang hingga baik. Namun, capaian kemampuan anak masih berbeda-beda pada setiap indikator. Keterampilan menangkap bola menunjukkan hasil yang lebih baik dibandingkan dengan keterampilan melempar, terutama pada aspek koordinasi gerak dan kontrol objek. Berdasarkan hasil tersebut, dapat disimpulkan bahwa kemampuan gerak manipulatif anak usia 4–5 tahun di PAUD Ummi An-Nisa sudah berkembang cukup baik, namun tetap perlu ditingkatkan melalui kegiatan pembelajaran motorik yang sesuai dengan karakteristik dan tahap perkembangan anak.

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Introduction

Gross motor development is one of the fundamental aspects of early childhood education because it is closely related to a child's readiness to participate in various learning and play activities. Gross motor skills enable children to move effectively, confidently, and adapt to their physical and social environment (Gallahue & Ozmun, 2006; Payne & Isaacs, 2017). Good gross motor skills are also the basis for the development of other aspects, such as cognitive, social-emotional, and language skills (Pica, 2010; Robinson et al., 2015).

One of the main components of gross motor skills is manipulative movement ability. Manipulative movement is defined as an individual's ability to control objects using coordination

between the hands, eyes, and other parts of the body (Gallahue & Donnelly, 2007). Common manipulative activities performed by young children include throwing, catching, kicking, and hitting objects. These skills play an important role because they require the integration of visual-motor coordination, postural control, and the regulation of movement strength and direction (Clark & Metcalfe, 2002; Haywood & Getchell, 2020).

At the age of 4–5 years, children are in a crucial phase in the development of manipulative movement skills as part of basic movement skills. At this stage, children begin to transition from early movement patterns to more mature movement patterns, although mastery still requires repeated practice and stimulation (Gallahue & Ozmun, 2006; Haywood & Getchell, 2020). Sujiono (2013) and Sumantri (2016) emphasise that manipulative skills such as throwing and catching a ball not only contribute to children's physical development but also support play activities, social interaction, and children's readiness to participate in learning in early childhood education settings.

However, various reports and studies show that in early childhood education learning practices, the development of motor skills, particularly manipulative movement skills, often does not receive as much attention as cognitive and language skills. Learning still tends to be dominated by sitting, writing, and worksheet activities, limiting children's opportunities to engage in active play (Pica, 2010; Sumantri, 2016). This condition has the potential to hinder the development of children's manipulative movement skills and cause significant variations in abilities between individuals (Gallahue & Donnelly, 2007; Robinson et al., 2015).

Theoretically, manipulative movement skills are part of basic movement skills that develop gradually according to a child's age and movement experience. At preschool age, these skills are not yet optimally developed and are still in a transitional stage from early movement patterns to more mature movement patterns (Gallahue & Ozmun, 2006). This developmental process is greatly influenced by the frequency of practice, the quality of stimulation, and the context of the play activities experienced by the child (Haywood & Getchell, 2020).

Clark and Metcalfe (2002), through the concept of the mountain of motor development, emphasise that children's motor development is the result of a dynamic interaction between biological and environmental factors. An environment rich in opportunities for active and meaningful play will provide a variety of movement experiences, thereby accelerating the maturation of children's motor skills. Conversely, limited movement experiences can hinder the development of manipulative skills even though the child is at an age where they should already be able to master these skills.

In the context of early childhood education in Indonesia, motor learning is recommended to be designed through a play-based approach and tailored to the characteristics of child development (Sujiono, 2013; Sumantri, 2016). Manipulative movements such as throwing and catching a ball are considered important indicators because they involve hand-eye coordination, body balance, and overall movement control. Therefore, children's manipulative movement abilities can be used as an indication of the extent of motor stimulation received by children in early childhood education settings. Various studies on gross motor skills in early childhood have been conducted, but most of these studies focus on the influence of learning models, games, or certain media on improving children's motor skills. These studies generally use an experimental design by comparing children's abilities before and after being given treatment (Robinson et al., 2015; Logan et al., 2018).

In contrast, studies that specifically describe the profile of the manipulative movement abilities of 4-5-year-old children descriptively, especially based on skill indicators, are still relatively limited. In fact, profile studies play an important role as a basis for mapping children's actual abilities before designing, implementing, or evaluating motor learning programmes (Sujiono & Sujiono, 2010; Clark & Metcalfe, 2002). This limitation in descriptive data means that early childhood teachers often lack a clear empirical picture of the manipulative movement abilities of children in their classes.

Based on this description, compiling a profile of the manipulative movement abilities of 4-5 year old children is important in order to provide a realistic picture of children's skill achievements at a particular stage of development. This information can be used by early childhood educators as a basis for designing motor learning activities that are more appropriate, contextual, and in line with children's developmental needs (Gallahue & Donnelly, 2007; Sumantri, 2016).

In addition, data on manipulative movement ability profiles can also be used as an initial reference for future researchers in developing learning models or motor stimulation programmes that are adapted to real conditions in the field. Therefore, this study focuses on describing the manipulative movement ability profiles of 4-5-year-old children at Umami An-Nisa PAUD, particularly in the skills of throwing and catching a ball.

Method

This study utilised a quantitative approach with a descriptive research design. This approach was chosen because the study aimed to describe the profile of the manipulative motor skills of children aged 4–5 years based on the children's skill achievements at the time of measurement. This study was not intended to compare groups or test the cause-and-effect relationship between variables, but rather to obtain a picture of the children's abilities as they are (Creswell & Creswell, 2018; Sugiyono, 2019).

The research subjects consisted of 12 children aged 4–5 years enrolled at the Umami An-Nisa Early Childhood Education Centre. The subjects were determined using total sampling, whereby all children in this age group were included as research subjects. This technique was used because the number of children was relatively small and all subjects met the specified age criteria (Sugiyono, 2019). The research was conducted during the current semester of the active academic year at PAUD Umami An-Nisa.

Data collection was carried out through structured observation using a manipulative movement ability test instrument. This instrument was used to measure children's ability to perform manipulative skills, particularly throwing and catching a ball, which were adapted to the developmental characteristics of children aged 4–5 years.

The measurement instrument included several indicators of manipulative movement abilities, namely body position and readiness when performing movements, coordination between the eyes and hands, control of objects when throwing and catching balls, and body balance during movement activities. Each indicator is assessed using a performance-based assessment scale that describes the child's level of movement mastery. The observation process is carried out by researchers with the assistance of classroom teachers so that the measurement activities continue to take place in a natural and comfortable atmosphere for the children (Sumantri, 2016).

The data obtained is analysed using descriptive statistical analysis. The analysis was carried out by calculating the average value, percentage, and distribution of the children's ability categories for each manipulative movement indicator. The results of the analysis were then presented in the form of tables and narrative descriptions to provide a comprehensive overview of the manipulative movement ability profile of 4-5-year-old children at the Umami An-Nisa Early Childhood Education Centre (Sugiyono, 2019).

The children's ability categories were determined based on the score range specified in the instrument, then interpreted into low, moderate, and good ability categories. This analysis aimed to observe the trends in children's ability achievements and the variation in abilities on each manipulative movement indicator.

To maintain data validity, this study applied observation persistence and consistency in the observation procedure. The instrument used refers to indicators of manipulative movement abilities that are in accordance with the developmental stages of early childhood as described in the theoretical study. In addition, observations were conducted in a structured and repetitive manner to reduce subjectivity in the assessment (Moleong, 2017; Sumantri, 2016).

Result and Discussion

This study presents an overview of the manipulative motor skills of 4–5-year-old children at Umami An-Nisa Early Childhood Education Centre based on measurements taken at the end of the learning activities. The manipulative motor skills observed included catching and throwing a ball. Each skill was assessed using five movement indicators with two trials for each child.

Based on the analysis of the total manipulative movement ability scores, an average score of 8.67 out of a maximum score of 10 was obtained. The distribution of children's manipulative movement ability categories can be seen in Table 1.

Table 1. Distribution of Manipulative Movement Abilities in Children Aged 4–5 Years.

Ability Category	Number of Children	Percentage
Good (8–10)	10	83.3%
Moderate (6–7)	2	16.7%
Low (≤ 5)	0	0%
Total	12	100%

These results indicate that most children fall into the good ability category. This suggests that, in general, children have been able to demonstrate manipulative motor skills in accordance with the indicators observed in this study.

The results of the observation show that most children aged 4–5 years at Ummi An-Nisa Early Childhood Education Centre are able to catch a ball well. The majority of children can keep their bodies upright and place both hands in front of their bodies when preparing to catch the ball. The ability to catch the ball with both hands is also relatively high, which indicates that eye-hand coordination has developed quite well.

However, there were still some children who were not consistent in extending their arms when catching balls coming from a certain distance. In several trials, children were not able to catch the ball optimally, so the scores on this indicator were not always maximal. This shows that although ball catching skills were generally in the good category, there were differences in achievement on each indicator between individuals.

The ball throwing skill profile shows a relatively higher level of difficulty compared to ball catching skills. The observation results show that most children have been able to raise their arms backwards and throw the ball towards the target quite well. This shows that children already have a basic mastery of throwing movements.

However, several indicators still show suboptimal achievements, especially in terms of hip and shoulder coordination and body balance when throwing. In some children, the hip and shoulder movements are not performed simultaneously, resulting in inaccurate direction and strength of the throw. In addition, some children appear to lose their balance after throwing, indicating that overall body control still needs to be improved.

Overall, ball throwing skills show greater variation in achievement than ball catching skills. These findings illustrate that throwing movements involve more complex coordination of body parts. Therefore, even though children are able to perform basic throwing movements, repeated stimulation and practice are needed so that children's manipulative movement skills can develop more optimally.

The results of this study indicate that the manipulative movement skills of children aged 4–5 years at PAUD Ummi An-Nisa are largely in the "good" category. Catching skills showed better achievement compared to throwing skills, which still displayed variations in ability across indicators. This finding aligns with motor development theory, which states that manipulative movement skills develop gradually through the interaction between biological and environmental factors (Clark & Metcalfe, 2002).

In terms of catching skills, most children were able to maintain an upright body position, place their hands in front, and catch the ball with both hands. This condition is consistent with the stages of manipulative motor development according to Gallahue and Donnelly (2007), who explain that preschool-aged children begin to master simple manipulative skills before progressing to more complex movement patterns. Nevertheless, some children were still inconsistent in extending their arms while catching. This suggests that although basic movements have been mastered, hand-eye coordination and object control still require repetitive practice.

In contrast to catching, throwing skills demand more complex coordination as they involve the cooperation of the arms, shoulders, hips, and body balance. The finding that some children were not yet able to rotate their hips and shoulders simultaneously or maintain balance while throwing indicates that these skills are still in the early stages of development. This is in line with Clark and Metcalfe (2002), who state that the mastery of motor skills is highly influenced by movement experience and the child's opportunity to practice in their surrounding environment. Sumantri (2016) also emphasizes that repetitive practice through play activities is essential to strengthen complex movement coordination in early childhood.

The difference in achievement between catching and throwing skills illustrates that each manipulative movement skill has a different level of difficulty. Catching is relatively easier because the movements are simpler and more controlled, whereas throwing requires the simultaneous coordination of several body parts. These findings support Sujiono's (2013) view that early childhood motor development needs to be adapted to the developmental characteristics and motor coordination abilities of the child.

The results of this study have implications for teaching practices in early childhood education (PAUD). The profile of children's manipulative movement skills can be used by teachers as a basis for designing motor learning activities that suit the children's ability levels. For example, throwing

and catching activities can be directed toward training movement coordination, object control, and body balance, while considering individual differences in ability. Furthermore, providing stimulation through fun, repetitive games can help children develop manipulative skills gradually (Gallahue & Donnelly, 2007; Sumantri, 2016).

Overall, this study demonstrates that children aged 4–5 years possess reasonably good basic manipulative movement skills, though variations in achievement remain across skill indicators. These variations highlight the need for more structured motor learning tailored to the children's developmental needs. Therefore, the profile data obtained in this study can serve as an empirical reference for PAUD teachers and future researchers in designing more effective motor stimulation programs that reflect real-world conditions.

Conclusion

Based on the research findings regarding the profile of manipulative movement skills in children aged 4–5 years at PAUD Umami An-Nisa, the following conclusions can be drawn:

1. General Proficiency: Most children fall within the moderate to good ability categories. The average score for manipulative movement skills was 8.67 out of a maximum of 10, indicating a solid mastery of basic manipulative movements.
2. Skill Comparison (Catching): Catching skills are generally superior to throwing skills, particularly in aspects of body positioning, hand-eye coordination, and object control. However, variations across indicators were still observed in several children.
3. Skill Complexity (Throwing): Throwing skills require more complex coordination—including the activation of the arms, shoulders, and hips, as well as balance control. Consequently, the variation in achievement across indicators is greater compared to catching skills.
4. Recommendations for Stimulation: These profile results highlight the necessity for structured and repetitive motor stimulation through play activities that align with children's developmental characteristics, ensuring that manipulative movement skills develop optimally.

Overall, this study provides an empirical overview of the manipulative movement skills of children aged 4–5 years in an early childhood education setting. These findings serve as a foundation for teachers and researchers to design more precise and contextual motor learning programs.

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