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The Children's Gross Motor Ability Level

Zaenal Abidin[1A-E*], Didik Purwanto[2B-D], Hendriana Sri Rejeki[3B-D], Rivalwan[4B-D]

[1,2,3,4] Universitas Tadulako, Sulawesi Tengah, Indonesia

zaenallabidin011@gmail.com[1*], didikpurwanto1283@gmail.com[2], rejeki240382@gmail.com[3], rivalwan@untad.ac.id[4]

ABSTRACT

Gross motor skills are fundamental components of children's physical development that support movement competence, physical activity participation, and readiness for learning, particularly during the elementary school years. Assessing children's gross motor abilities is essential to provide objective information that can be used to design appropriate physical education programs and developmental interventions. Therefore, this study aimed to determine the gross motor skill level of lower-grade students at SDI Alhidayah Palu using the Test of Gross Motor Development-2 (TGMD-2) instrument. This study employed a descriptive quantitative approach with a survey method. The population consisted of all lower-grade students at SDI Alhidayah Palu, totaling 30 children. Due to the relatively small population size, a total sampling technique was applied, involving all students as research participants. The TGMD-2 instrument was used to assess two major components of gross motor skills: locomotor skills and object-control skills. Data were analyzed using descriptive percentage statistics. The results revealed that in the locomotor skill component, 66.67% (20 students) were categorized as Good, 13.33% (4 students) as Very Good, 16.67% (5 students) as Moderate, and 3.33% (1 student) as Poor. In the object-control component, 60.00% (18 students) were categorized as Good, 6.67% (2 students) as Very Good, 23.33% (7 students) as Moderate, and 10.00% (3 students) as Poor. In conclusion, the overall gross motor skill level of lower-grade students at SDI Alhidayah Palu is classified as Good. Although students demonstrated satisfactory performance in both locomotor and object-control skills, additional stimulation and structured physical education activities, particularly focusing on object-control skills, are recommended to further optimize children's motor development.

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INTRODUCTION

Gross motor skills are fundamental components of child development that significantly influence physical growth, movement competence, participation in physical activities, and readiness for academic learning, particularly in physical education settings. Gross motor skills involve coordinated movements of large muscle groups controlled by the nervous system, enabling children to perform locomotor and object-

control movements such as running, jumping, hopping, throwing, catching, and kicking (Ramadhani, 2024). These abilities serve as the foundation for more complex motor performance and contribute to children's overall health, fitness, and psychosocial development (Logan et al., 2018; Barnett et al., 2022).

Elementary school age represents a critical developmental period during which children experience rapid improvements in motor coordination and physical capabilities. During this stage, appropriate stimulation through structured physical activity and quality physical education programs is essential to support optimal motor development (Robinson et al., 2015; Palmer et al., 2021). Children with well-developed gross motor skills tend to demonstrate higher levels of physical activity participation, better physical fitness, improved self-confidence, and greater social interaction compared to peers with lower motor competence (Lubans et al., 2016; Barnett et al., 2022).

Despite the recognized importance of gross motor development, many elementary schools still lack comprehensive information regarding the actual motor competence levels of their students. One major challenge is the limited implementation of systematic assessments using standardized measurement instruments (Sugiyanto, 2024). As a result, teachers often rely on subjective observations that may not accurately reflect students' motor development status. Without objective assessment data, schools may face difficulties in designing appropriate intervention programs to enhance children's movement skills.

Recent studies conducted in Indonesia indicate that gross motor skills among elementary school students remain in the moderate-to-low category. Santoso (2021) reported that a considerable proportion of elementary students exhibited deficiencies in locomotor and object-control skills. Similarly, Hafizah (2026) found that students particularly struggled with object-control skills such as catching, kicking, and throwing. These findings raise concerns because inadequate motor competence during childhood may negatively affect lifelong physical activity participation and overall health outcomes (Stodden et al., 2021).

Furthermore, gross motor development is influenced by numerous factors, including physical activity levels, family support, environmental conditions, access to sports facilities, nutritional status, and participation in extracurricular sports programs (Andrianto, 2025; Saputra, 2025). Children who regularly engage in organized sports and active play generally demonstrate superior motor competence compared to less active peers (Barnett et al., 2022). Consequently, identifying the current level of children's gross motor skills is crucial for developing effective educational and intervention strategies.

Research concerning children's gross motor development has expanded considerably over the last decade. Internationally, numerous studies have demonstrated strong associations between motor competence, physical activity participation, physical fitness, and academic achievement (Robinson et al., 2015; Logan et al., 2018; Hulteen et al., 2020). These studies emphasize that gross motor skills are not only indicators of physical development but also predictors of long-term health and educational outcomes.

One of the most widely accepted instruments for assessing children's gross motor skills is the Test of Gross Motor Development-2 (TGMD-2), developed by Ulrich. The TGMD-2 has demonstrated excellent validity and reliability across diverse cultural contexts and age groups (Ulrich, 2019). This instrument evaluates two primary domains of gross motor competence: locomotor skills and object-control skills. Locomotor skills include running, galloping, hopping, leaping, horizontal jumping, and sliding, whereas object-control skills encompass striking, dribbling, catching, kicking, overhand throwing, and underhand rolling (Kusumasari, 2025).

Numerous studies conducted in Indonesia have adopted the TGMD-2 instrument to assess children's motor development. Fitriady (2024) reported that TGMD-2 effectively identified developmental differences among elementary school students and provided valuable information for designing targeted interventions. Similarly, Setyawan (2026) concluded that TGMD-2 offers detailed diagnostic information regarding specific movement deficiencies that can be addressed through physical education programs.

International evidence also supports the effectiveness of TGMD-2 for evaluating children's motor competence. Palmer et al. (2021) demonstrated that TGMD-2 scores significantly correlate with physical activity levels and physical fitness indicators among school-aged children. Additionally, Webster and Ulrich (2017) highlighted that TGMD-based assessments enable educators to monitor developmental progress and evaluate intervention effectiveness.

Recent advancements in motor development research have emphasized the importance of school-based assessments. Studies by Barnett et al. (2022), Hulteen et al. (2020), and Robinson et al. (2015) suggest that schools serve as ideal environments for identifying motor competence levels and implementing evidence-based interventions. Therefore, conducting gross motor skill surveys using standardized instruments has become an essential practice in modern physical education.

Although numerous studies have examined children's gross motor skills, several research gaps remain evident. First, most Indonesian studies have focused on regional or district-level samples without providing specific data from individual schools, particularly private Islamic elementary schools. Consequently, localized evidence regarding students' motor competence remains limited. Second, previous studies have predominantly investigated the relationships between motor skills and various influencing factors such as physical activity, nutrition, or sports participation (Santoso, 2021; Saputra, 2025). Relatively few studies have concentrated on providing comprehensive descriptive profiles of gross motor competence within specific school contexts using standardized measurement tools. Third, differences in geographical, social, cultural, and educational environments may produce varying motor development outcomes among children. Therefore, findings from one school or region cannot necessarily be generalized to another context. SDI Alhidayah possesses unique educational characteristics that may influence students' movement experiences and motor development patterns. However, no empirical data currently exist regarding the gross motor ability levels of students in this institution. Fourth, despite the increasing

adoption of TGMD-2 in Indonesia, studies specifically utilizing this instrument to establish baseline motor competence profiles for school-based curriculum planning remain limited. Such information is essential for evidence-based physical education programming and long-term student development.

Based on the identified problems and research gaps, this study aims to determine the level of gross motor skills among students at SDI Alhidayah using the Test of Gross Motor Development-2 (TGMD-2). Specifically, the study seeks to describe students' locomotor skills, object-control skills, and overall gross motor competence levels. The novelty of this study lies in several aspects. First, it provides empirical baseline data regarding gross motor competence among students at SDI Alhidayah, a context that has not previously been investigated. Second, the study employs the internationally recognized TGMD-2 instrument to generate objective and standardized measurements of children's motor abilities. Third, the findings are expected to serve as practical evidence for developing school-based physical education programs tailored to students' actual developmental needs. Finally, the study contributes to the growing body of Indonesian literature concerning children's motor development and supports evidence-based educational decision-making.

In summary, gross motor skills constitute a fundamental aspect of children's development that influences physical activity participation, health, fitness, and educational readiness. Despite their importance, many schools still lack objective information regarding students' motor competence levels. Previous studies have reported moderate-to-low motor skill performance among Indonesian elementary school children, highlighting the need for systematic assessment. The TGMD-2 instrument provides a valid and reliable means of evaluating locomotor and object-control skills. However, empirical evidence concerning gross motor competence at SDI Alhidayah remains unavailable. Therefore, this study seeks to fill this gap by surveying students' gross motor abilities using TGMD-2, thereby providing valuable information for educators and schools to develop more effective and targeted physical education programs.

METHODS

This study employed a descriptive quantitative research design using a survey method to identify and describe the level of gross motor skills among students at SDI Alhidayah Palu. A descriptive survey approach is appropriate for obtaining factual and objective information regarding the current condition of a particular population without manipulating variables or implementing experimental treatments (Creswell & Creswell, 2018). In the context of motor development research, survey-based assessments are frequently utilized to provide a comprehensive overview of children's movement competence and to establish baseline data for educational planning and intervention programs (Robinson et al., 2015; Barnett et al., 2022).

The primary objective of this study was to determine and describe the gross motor ability levels of children at SDI Alhidayah based on direct field measurements using the

Test of Gross Motor Development-2 (TGMD-2). Gross motor competence is recognized as a fundamental indicator of children's physical development because it reflects the integration of muscular strength, coordination, balance, and neuromotor control required to perform various movement tasks (Logan et al., 2018; Hulteen et al., 2020). Therefore, an objective assessment is necessary to evaluate children's developmental status accurately.

This research involved a single variable, namely children's gross motor skills. The study was conducted at SDI Alhidayah Palu, Indonesia. The population consisted of all lower-grade elementary school students enrolled at the school, totaling 30 children. Because the population size was relatively small and manageable, this study employed a total sampling technique, whereby all members of the population were included as research participants. Total sampling is recommended when researchers seek to obtain comprehensive information from the entire target population and avoid sampling bias (Sugiyono, 2022).

The instrument utilized in this study was the Test of Gross Motor Development-2 (TGMD-2) developed by Ulrich (2000), which remains one of the most widely used and validated instruments for assessing children's gross motor competence internationally (Webster & Ulrich, 2017; Palmer et al., 2021). The TGMD-2 evaluates two major dimensions of gross motor development: locomotor skills and object-control skills. Locomotor skills include running, galloping, hopping, leaping, horizontal jumping, and sliding, while object-control skills consist of striking, dribbling, catching, kicking, overhand throwing, and underhand rolling (Ulrich, 2000; Widyawan, 2021). These components represent essential movement patterns that support children's participation in physical activity and sports (Barnett et al., 2022).

Data collection was conducted through direct observation, with each participant performing the movement tasks according to the TGMD-2 testing procedures. Performance scores were then classified into four categories: Very Good, Good, Average, and Poor, based on the established assessment criteria. The use of TGMD-2 has been demonstrated to possess strong validity and reliability in measuring children's motor competence across diverse educational and cultural settings (Fitriady, 2024; Setyawan, 2026).

The collected data were analyzed using descriptive statistical techniques. Frequencies and percentages were calculated to determine the distribution of students across each gross motor skill category. The percentage formula used in this study was:

$$P = \frac{F}{N} \times 100\%$$

where P represents the percentage, F denotes the frequency of observed results, and N indicates the total number of participants. The results were then presented in tables and percentage distributions to provide a clear description of the gross motor ability levels of children at SDI Alhidayah Palu.

RESULTS AND DISCUSSION

Result

The findings of this study were obtained through a survey of children's gross motor ability levels at SDI Alhidayah Palu using the Test of Gross Motor Development-2 (TGMD-2) instrument. The TGMD-2 assesses two major components of gross motor skills, namely locomotor skills and object-control skills. The study involved a total of 30 lower-grade elementary school students who served as the research sample. The results were analyzed descriptively using frequency and percentage distributions to provide an overview of students' gross motor competence.

Locomotor Skill Assessment Results

The results of the locomotor skill assessment are presented in Table 1.

Table 1.
Recapitulation of Locomotor Skill Assessment Results Using TGMD-2

Category	Frequency (F)	Percentage (%)
Very Good	4	13.33
Good	20	66.67
Moderate	5	16.67
Poor	1	3.33
Total	**30**	**100**

Based on Table 1, the majority of students demonstrated a Good level of locomotor ability. Out of 30 participants, 20 students (66.67%) were classified in the Good category, while 4 students (13.33%) achieved the Very Good category. Meanwhile, 5 students (16.67%) were categorized as Moderate, and only 1 student (3.33%) fell into the Poor category. These findings indicate that most students possess satisfactory locomotor competence, enabling them to perform fundamental movements such as running, hopping, jumping, galloping, and sliding effectively.

Object-Control Skill Assessment Results

The results of the object-control skill assessment are presented in Table 2.

Table 2.
Recapitulation of Object-Control Skill Assessment Results Using TGMD-2

Category	Frequency (F)	Percentage (%)
Very Good	2	6.67
Good	18	60.00
Moderate	7	23.33
Poor	3	10.00
Total	**30**	**100**

Table 2 shows that the majority of students were also categorized as **Good** in object-control skills. Specifically, 18 students (60.00%) achieved the Good category, while 2 students (6.67%) reached the Very Good category. In addition, 7 students (23.33%) were classified as Moderate, and 3 students (10.00%) fell into the Poor category. These results suggest that although most students have developed adequate object-control competence, a considerable proportion still require improvement in manipulative skills such as throwing, catching, kicking, dribbling, and striking.

The results obtained from the TGMD-2 assessment provide a comprehensive profile of the gross motor abilities of students at SDI Alhidayah Palu. Gross motor skills involve movement patterns that utilize large muscle groups and are strongly influenced by biological maturation, environmental stimulation, and learning opportunities (Arwih, 2022). The TGMD-2 instrument was selected because it evaluates the quality of movement performance rather than merely measuring quantitative outcomes, thereby providing a more accurate representation of children's motor competence (Pratama, 2024).

The locomotor component demonstrated stronger performance compared to object-control skills. As shown in Table 1, approximately two-thirds of students (66.67%) were categorized as Good in locomotor movements. This finding suggests that children are generally capable of performing basic movement patterns efficiently. Such results are consistent with developmental theories indicating that elementary school-aged children naturally acquire locomotor skills through daily play activities and interactions with their environment.

In contrast, the object-control component showed slightly lower achievement levels. Although the majority of students (60.00%) remained within the Good category, the percentages of students categorized as Moderate (23.33%) and Poor (10.00%) were notably higher than those observed in locomotor skills. Object-control movements require more complex coordination involving visual perception, timing, and synchronized upper- and lower-body movements. Skills such as throwing, catching, and kicking demand continuous practice and structured learning experiences.

Overall, the findings indicate that the gross motor ability level of students at SDI Alhidayah Palu can generally be classified as Good. Nevertheless, the presence of students in the Moderate and Poor categories highlights the existence of developmental variability among individuals. These results emphasize the importance of implementing more structured physical education programs, particularly those focusing on object-control and manipulative skills. Through targeted interventions and regular practice opportunities, students' gross motor competence can be further enhanced, enabling a greater proportion of children to achieve the Very Good category and supporting their overall physical development.

Discussion

60.00% achieved the Good category for object-control skills. These findings suggest that most students possess adequate fundamental movement competence, which is essential for supporting physical activity participation, physical fitness, and long-term motor development. Gross motor competence is widely recognized as a crucial component of child development because it contributes to physical, cognitive, emotional, and social growth during the elementary school years (Robinson et al., 2015; Logan et al., 2018).

The relatively high percentage of students in the Good category for locomotor skills indicates that children at SDI Alhidayah have developed basic movement patterns effectively. Locomotor movements such as running, hopping, jumping, galloping, and sliding

are among the first movement skills acquired during childhood because they are frequently practiced through daily activities and active play (Barnett et al., 2022). According to Stodden et al. (2021), locomotor competence develops naturally when children are provided with sufficient opportunities to explore their environment through movement. Therefore, the dominance of the Good category in this study may reflect the students' active engagement in play activities both at school and in their home environments.

These findings are consistent with previous studies conducted in Indonesia. Hambali (2023) reported that elementary school students generally demonstrate better locomotor performance than manipulative or object-control skills because locomotor movements are more frequently integrated into children's daily routines. Similarly, Arwih (2022) found that lower-grade elementary students tend to achieve higher scores in running and jumping activities compared to throwing and catching tasks. International studies also support these results, showing that locomotor skills often emerge earlier and are more easily mastered than object-control skills because they require less complex coordination processes (Hulteen et al., 2020; Palmer et al., 2021).

From a developmental perspective, locomotor skills serve as the foundation for children's movement competence. These skills enable children to explore their surroundings, interact socially, and participate confidently in physical education activities (Lubans et al., 2016). Children with stronger locomotor abilities tend to demonstrate higher levels of self-confidence and physical activity participation than children with lower movement competence (Barnett et al., 2022). Consequently, the positive locomotor outcomes observed in this study represent an important indicator of healthy motor development among students at SDI Alhidayah.

However, the results of the object-control assessment revealed slightly lower performance levels compared to locomotor skills. Although 60.00% of students were classified in the Good category, the percentages of students categorized as Moderate (23.33%) and Poor (10.00%) were substantially higher than those observed in the locomotor component. This finding indicates that object-control skills remain a developmental challenge for some students. Object-control skills involve more complex movement patterns that require the integration of visual perception, timing, hand-eye coordination, foot-eye coordination, balance, and motor planning (Webster & Ulrich, 2017).

The lower achievement observed in object-control skills can be explained by the nature of manipulative movements themselves. Skills such as throwing, catching, kicking, dribbling, and striking require structured learning experiences and repeated practice opportunities (Pranoto, 2016). Unlike locomotor skills, which often develop through spontaneous play, object-control skills depend heavily on instructional guidance and environmental stimulation (Robinson et al., 2015). Therefore, children who have limited exposure to sports activities or manipulative games may experience slower development in these areas.

The present findings support the results of Hafizah (2026), who reported that elementary school students frequently demonstrate weaknesses in object-control tasks, particularly catching and throwing. Likewise, Andrianto (2025) found that students who

actively participated in extracurricular sports programs achieved significantly higher object-control scores than those who did not engage in organized physical activities. These findings highlight the critical role of learning opportunities and physical activity participation in shaping children's motor competence.

Furthermore, the presence of students in the Moderate and Poor categories suggests that individual differences in motor development remain evident among the participants. According to Gallahue et al. (2018), motor development is influenced by a combination of biological maturation, environmental factors, physical activity experiences, and educational support. Children do not develop motor skills at identical rates, and developmental variability is considered a normal phenomenon during childhood. Nevertheless, prolonged deficiencies in gross motor competence may negatively affect children's participation in physical activities and sports later in life (Logan et al., 2018).

Environmental factors may also contribute to the observed variability. Previous studies have shown that children who have access to adequate play spaces, sports facilities, and supportive family environments tend to demonstrate higher levels of motor competence (Barnett et al., 2022; Saputra, 2025). In contrast, limited opportunities for movement exploration may restrict children's motor development. Therefore, differences in home environments, parental support, and participation in extracurricular sports may partially explain why some students achieved lower TGMD-2 scores.

The use of the TGMD-2 instrument in this study provides valuable insight into the qualitative aspects of children's movement performance. Unlike conventional physical fitness tests that focus solely on outcomes, TGMD-2 evaluates the quality and correctness of movement execution (Ulrich, 2019). This characteristic makes TGMD-2 particularly effective for identifying specific motor deficiencies and developmental needs (Fitriady, 2024). Consequently, the findings of this study can serve as a useful reference for teachers in designing more targeted physical education programs.

Another important finding is that the majority of students have not yet reached the Very Good category, particularly in object-control skills. This suggests that although the overall motor profile can be considered satisfactory, there remains substantial room for improvement. According to Setyawan (2026), structured intervention programs emphasizing manipulative movement experiences can significantly improve children's object-control competence. Activities such as ball games, throwing drills, catching exercises, and modified sports games have been shown to enhance coordination and motor control among elementary school students.

The role of physical education teachers is therefore essential in facilitating motor development. Effective physical education programs should not only focus on physical fitness but also emphasize the mastery of fundamental movement skills (SHAPE America, 2022). Teachers should provide varied, enjoyable, and developmentally appropriate learning activities that encourage children to practice both locomotor and object-control skills regularly. Play-based learning approaches, modified games, and cooperative movement activities have been identified as effective strategies for improving children's motor competence (Palmer et al., 2021).

Moreover, the findings of this study reinforce the theoretical framework proposed by Stodden et al. (2021), which suggests that motor competence serves as a foundation for lifelong physical activity participation. Children with higher movement competence are more likely to engage in sports, maintain active lifestyles, and achieve better physical health outcomes throughout adolescence and adulthood. Therefore, improving gross motor competence during the elementary school years should be considered a priority within school-based physical education programs.

Overall, the results demonstrate that students at SDI Alhidayah Palu possess generally good gross motor competence, particularly in locomotor skills. Nevertheless, object-control skills require further attention due to the relatively higher proportion of students categorized as Moderate and Poor. These findings highlight the importance of providing structured physical education experiences that emphasize manipulative movement development. Through continuous stimulation, systematic instruction, and supportive learning environments, children's gross motor abilities can be further optimized, enabling them to achieve higher levels of movement competence and supporting their overall physical development, academic readiness, and long-term health outcomes.

CONCLUSION

Based on the results of the study conducted using the Test of Gross Motor Development-2 (TGMD-2) instrument on 30 lower-grade students of SDI Alhidayah Palu, it can be concluded that the overall level of students' gross motor skills falls within the Good category. The findings indicate that the majority of students demonstrated satisfactory performance in both assessed components of gross motor development, namely locomotor skills and object-control skills.

In the locomotor domain, which includes movements such as running, hopping, jumping, galloping, and sliding, 66.67% of students were classified in the Good category, while 13.33% achieved the Very Good category. In the object-control domain, involving skills such as throwing, catching, kicking, and dribbling, 60.00% of students were categorized as Good and 6.67% as Very Good. These results suggest that students possess adequate fundamental movement competence appropriate for their developmental stage.

The study also revealed that locomotor skills were slightly more developed than object-control skills, indicating that manipulative movement abilities require additional attention and practice. Nevertheless, both domains collectively demonstrate that the gross motor development of students at SDI Alhidayah Palu is generally satisfactory and supports active participation in physical education and daily physical activities.

Therefore, schools and physical education teachers are encouraged to continue providing structured, enjoyable, and developmentally appropriate movement experiences, particularly those emphasizing object-control skills, to further enhance students' overall motor competence and support their long-term physical development.

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