

## Are boys and girls in rural areas equal in terms of gross motor skills?

### ¿Son iguales los niños y las niñas de las zonas rurales en términos de motricidad gruesa?

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**Abstract.** Proficiency in gross motor skills serves as the foundational groundwork for children as they navigate through life. Fundamental competence in gross motor skills is particularly essential for elementary school students, enabling them to engage in play, sports, and societal activities, while also reaping health benefits through a consistently active lifestyle. Inadequate competency in gross motor skills may potentially limit the prospects of leading an active life. This research seeks to explore potential disparities in gross motor skills between male and female students in rural areas. The study sample encompasses 96 elementary school students spanning grades 4 to 6, with an even distribution of 48 boys and 48 girls. The measurement of gross motor skills is conducted using Ulrich's TGMD-2, and the data is subjected to descriptive statistical analysis. The results of the gender difference test reveal a significance level of 0.259 ( $p > 0.05$ ), indicating similar basic movement skills. Both boys and girls fall within the average ability category on a scale of 91-110, with mean scores of 98.43 for boys and 94.87 for girls. In grade 4, both genders start at the same level, experience an increase in grade 5, and a decrease in grade 6. However, these fluctuations are statistically insignificant, as affirmed by the t-test results, indicating comparable motor skills in both groups. The outcomes of this study aim to provide valuable insights into the nuances of motor skill development in rural settings, offering input for strategies to foster equitable physical development among boys and girls in such environments.

**Keywords:** Gross motor, boys and girls, rural students, primary school

**Resumen.** El dominio de la motricidad gruesa es la base de la vida de los niños. La competencia fundamental en motricidad gruesa es especialmente esencial para los alumnos de primaria, ya que les permite participar en juegos, deportes y actividades sociales, al tiempo que obtienen beneficios para la salud gracias a un estilo de vida activo y constante. Una competencia inadecuada en habilidades motoras gruesas puede limitar potencialmente las perspectivas de llevar una vida activa. Esta investigación pretende explorar las posibles disparidades en la motricidad gruesa entre alumnos y alumnas de zonas rurales. La muestra del estudio abarca 96 alumnos de primaria de 4° a 6° curso, con una distribución equilibrada de 48 niños y 48 niñas. La medición de la motricidad gruesa se realiza mediante el TGMD-2 de Ulrich, y los datos se someten a un análisis estadístico descriptivo. Los resultados de la prueba de diferencia de género revelan un nivel de significación de 0,259 ( $p > 0,05$ ), lo que indica habilidades básicas de movimiento similares. Tanto los chicos como las chicas se sitúan en la categoría de capacidad media en una escala de 91-110, con puntuaciones medias de 98,43 para los chicos y 94,87 para las chicas. En 4° curso, ambos géneros comienzan en el mismo nivel, experimentan un aumento en 5° curso y un descenso en 6° curso. Sin embargo, estas fluctuaciones son estadísticamente insignificantes, como afirman los resultados de la prueba t, lo que indica que las habilidades motrices de ambos grupos son comparables. Los resultados de este estudio pretenden aportar información valiosa sobre los matices del desarrollo de las habilidades motrices en entornos rurales, ofreciendo información para estrategias que fomenten el desarrollo físico equitativo entre niños y niñas en dichos entornos.

**Palabras clave:** Motricidad gruesa, niños y niñas, estudiantes rurales, escuela primaria

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## Introduction

Motor skills are an interesting research study. Various studies prove that gross motor skills have an important role in children's growth and development (Samodra et al., 2023). It turns out that there is a relationship between basic movement skills, coordination gross skills, and movement abilities in children aged 7-9 years (Khodaverdi et al., 2021). Static balance turns out to have an effect on coordination, abdominal strength, endurance, and power, while dynamic balance correlates with explosive power and endurance in 11-year-old children, and this balance is related to movement skills (Groselj et al., 2019). The importance of movement skills depends on several variables, such as academic achievement, self-concept, socialization, and adaptation skills, but measurements of gross movement skills in primary school students show that none are at a superior level or above (Rechtik et al., 2019). Other research evidence suggests that

badminton interventions can develop basic movement skills and fitness in children aged 8–12 years, conducted fortnightly for 6 weeks (Duncan et al., 2023). However, children who receive movement learning interventions do better than those who do not (Johnson et al., 2023; Melvin Chung et al., 2023). The more frequent sports practice, the more gross motor coordination skills will improve (Bezerra-Santos et al., 2023). Physical activity interventions have been found to improve movement and cognitive development (Biino et al., 2023).

Physical activity programs for children can convincingly improve manipulation skills (Yuan et al., 2023). Gymnastic activities accompanied by music have a positive impact on gross motor development as well as children's well-being (Lei et al., 2023). Games with large balls are effective in improving gross motor skills (Dewi, 2023). Traditional Engkrang games from Indonesia have been shown to improve children's gross motor skills with an action research design

(Reviyanti & Reza, 2023). For children with autism, regular physical activity is very important; this is related to the impact of active living habits (Kaplánová et al., 2023).

If these gross motor skills are not taken care of properly, research evidence has shown that people with low coordination and fine motor skills in childhood are at increased risk of mid back pain (Hestbæk et al., 2023). For example, the use of social media decreases movement, social, and emotional abilities (Orr & Caspi, 2023). Sedentary living habits contribute to more severe injuries in the event of a fall as a result of poor motor coordination skills (Campbell-Pierre & Rhea, 2023).

Research evidence on 4-5-year-old children suggests that gross and fine motor skills are closely related to language development and numeracy (Rodríguez-Guerrero et al., 2023). It is stated that boys will be more active than girls, and inactive behavior will negatively affect motor mastery (Dana et al., 2023). Based on research on age and gender being a differentiator in motor abilities (Borukova & Mavrudiev, 2020; Padmakar & Mukherjee, 2020; Pahlevanian & Ahmadizadeh, 2014), boys are better than girls in throwing skills (Beseler et al., 2022; Halverson et al., 1982; Johnson et al., 2019; Sakurai & Miyashita, 1983). This is due to growth differences associated with limb length (Gromeier et al., 2017; M.A. & J., 2001). Based on this, it affects the lives of children (Johnson et al., 2019).

Research findings have consistently underscored the significance of gross motor skills (Suryadi et al., 2024). The positive impact on growth and development is more substantial with higher gross motor skills. The cultivation of movement competence is crucial for instilling a lifelong culture of active living in both healthy and disabled children. Continuous efforts to enhance motor skills are imperative. To lay the groundwork for designing effective motor skill improvement strategies, it is essential to gather valid data on the existing skill levels. Teachers play a pivotal role in students' academic success (Aziz, Okilanda, Permadi, et al., 2023; Aziz, Okilanda, Rozi, et al., 2023; Hardinata et al., 2023; Mashud et al., 2023; Umar et al., 2023), contributing to motor skill development by offering encouragement and fostering a supportive learning environment (Shey, 2020). Detecting potential delays in children's movement coordination is essential for proper monitoring of their motor development ((Ganapathy Sankar & Monisha, 2020). While prior research has examined gross motor abilities in children residing in coastal and hilly areas (Samodra et al., 2023), it has not specifically delved into gender differences among boys and girls. This research addresses the significance of studying motor abilities with a focus on gender, as it aims to explore variances in the motor skills of male and female elementary school students.

### **Research Method**

#### *Participant*

Information regarding the gross motor skills of fourth to sixth-grade students in rural elementary schools was

collected from State Elementary School 27 Sungai Kakap, Pontianak and State School 38 Nanga Tayap, Ketapang, West Kalimantan, Indonesia. The selection of samples was carried out using purposive sampling, resulting in a research sample comprising 96 students, equally divided between 48 boys and 48 girls. The sample in this study was aged 9-12 years.

### **Research Design**

This research is quantitative and descriptive, using the survey method. In this study, tests and measurements were given to determine gross motor skills in students. In this case, the research focused on the comparison of gross motor skills in male and female students, so it can be said that this research is a comparative study. This research instrument's gross motor skills are obtained by conducting tests with TGMD-2 (O' Brien et al., 2016), which consist of run, gallop, hoop, horizontal jump, leaping, sliding, catching, striking a stationary ball, kick, overhand throw, underhand roll, and stationary dribble.

### **Statistical Analysis**

The analysis of data in this research employed descriptive analysis. The primary objective was to assess the gross motor skills of elementary school students, differentiate between male and female students, and streamline the presentation of research findings. Additionally, to discern any distinctions, a normality test was conducted. If the data exhibited a normal distribution, an independent t-test was applied; otherwise, non-parametric methods were employed. The data analysis for this study was facilitated using the SPSS Version 26 application.

### **Research results**

The results of the study are shown in Table 1. It is presented that the mean value of the ability of both male students is 98.43 and that of female students is 94.87, with a standard deviation of 16.99 for men and 13.55 for women. Based on this data, the ability of female students is below that of boys and has a closer distance than that of girls based on the standard deviation.

Likewise, the results of the description in Table 2 show the range of mean scores for boys between 88 and 107.84, while the girls are 90.14 and 102.84. Table 3 and figure 1 above explain that the boys' good motor skills are still 29.17% below average, 8.5% at average ability, and 25% above average, and there are only 8.33% at superior and none more than superior. While women's abilities are still 41.66% below average, 43.75% average, 12.55 above average, and 2.08% superior, based on the results of the normality test with Kolmogorov-Smirnov, it shows a significance value of ( $p > 0.05$ ), so the data can be said to be normally distributed. So, it is feasible to continue using parametric tests.

The results can be seen in table 4. Based on the results of the t-test, it can be concluded that between boys and girls in elementary school students have the same ability

in gross motor skills. This can be seen from the significance of the t-test of 0.259. The results are seen in table 5.

Table 1. Description of motor test results of male and female students

	N	Valid	Statistics	
			boys	girl
		Missing	48	48
Mean			98.4375	94.8750
Median			100.0000	95.5000
Mode			115.00	88.00
Std. Deviation			16.99300	13.55780
Variance			288.762	183.814
Range			69.00	54.00

Table 2. Description of the motor test results of male and female students by class

Statistic	Valid	Putra 4	Putra 5	Putra 6	Putri 4	Putri 5	Putri 6
		N	18	17	13	14	15
	Missing	78	79	83	82	81	77
Mean		88.00	102.2941	107.84	90.142	102.60	92.26
Median		88.00	106.00	106.00	91.00	103.00	88.00
Mode		91.00	115.00	121.00	76.00	103.00	88.00
Std. Deviation		17.06	13.64	13.77	10.55	14.38	12.81

Table 5. T-test results

	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
data	Equal variances assumed	3.171	.078	1.135	94	.259	356.250	313.773	-266.753	979.253
	Equal variances not assumed			1.135	89.582	.259	356.250	313.773	-267.154	979.654

## Discussion

This research seeks to explore potential disparities in gross motor skills between male and female students residing in rural areas. Additionally, the study aims to evaluate the development of gross motor skills among elementary school students. The sample for this study comprised 48 boys and 48 girls, all exhibiting basic movement skills at an average (medium) proficiency level. The outcomes revealed that, despite the ample space for movement in rural settings, gross motor skills did not attain high levels and tended to remain at a moderate level. Furthermore, the results indicated that there were no discernible differences between male and female elementary school students, suggesting a similarity in their gross motor skills. This outcome aligns with previous research by Lorson et al., (2013); Sakurai & Miyashita, (1983), particularly in their cross-sectional studies on throwing ability. Another study found differences in students living in rural and hilly areas (Samodra et al., 2023).

It prompts the question of whether contemporary children, even in rural settings, are engaging less in active play, a factor traditionally deemed beneficial for enhancing gross motor skills in children (Veselovsky et al., 2023). Meanwhile, when children are at school, it is certain that they will get physical education interventions, one of which is

Table 3. Results of Descriptive Ratings of Gross Motor Skills in Male and Female Students

Descriptive Ratings	Gross Motor Qoutient	Girls	Boys
Very Superior	> 130	0	0
Superior	121 - 130	2,08%	8,33%
Above Average	111 - 120	12,50%	25%
Average	90 - 110	43,75%	37,50%
Below Averager	80 - 89	22,91%	12,50%
Poor	70 -79	16,66%	12,50%
Very Poor	<70	2,08%	4,17%

Table 4. Data normality test

	Kolmogorov-Smirnov <sup>a</sup>		
	Statistic	df	Sig.
boys	.127	48	.052
girl	.111	48	.189

a. Lilliefors Significance Correction

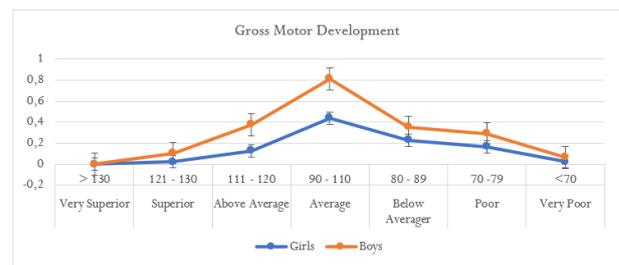


Figure 1. Diagram of students' gross motor development

badminton, according to research, which can have an influence on basic movement skills (Duncan et al., 2020). According to the study of physical education, motion shows that increased physical activity will increase if children are competent in basic movement skills. Teachers with motion learning play a big role in children's motor development (Abusleme-Allimant et al., 2023; Gavigan et al., 2023; Kelly et al., 2021), Especially at an early age of 3-5 years, it is necessary to develop gross movement skills; this gross movement is one of the indicators to estimate the child's social development in the end (Gandotra et al., 2023). Children must be convinced and understood about the key achievements of movement skills that have been achieved; this perception has a positive effect on children's abilities (Niemiistö et al., 2023), Based on this research, physical education teachers must be able to not only teach various movement skills but also be able to convince students so that students have confidence in their mastery of skills (Haïdara et al., 2023; Harianto et al., 2023; Rubiyatno et al., 2023; Suryadi et al., 2023). This is very important considering that when locomotor movement is good, it will have a positive effect on vocabulary mastery.

While object control skills are related to children's attention, if fine motor skills are good, they are closely related to the ability to get language, numeracy, and attention skills (Cinar et al., 2023). Further studies on balance and

coordination can be developed from physical activities performed (Rojas et al., 2023). Providing early perception with video shows has a positive impact on learning motion (Mohammad & Boushehry, 2023). Activities such as out-bound will be able to improve gross motor skills in children (Lita et al., 2023), while games that are presented accompanied by music with various movements such as jumping, pivoting, and balance games up to 7 posts have a very positive effect on the gross motor development of elementary school students (Sriwahyuniati et al., 2023). The positive value of this motor transfer is that, in addition to increasing fitness, mastery of gross and fine motor skills will increase the level of children's attention (Bernal et al., 2023). Not directly, motor skills will improve academic achievement; at least the more good motor skills, the ability to pay attention will increase. This is what will then improve the quality of learning and learning outcomes. The case of gross motor research in children who have below-normal weight explains that boys are better than girls in strength, speed, and coordination, while girls are superior in flexibility (Nadzmi et al., 2021). A review of research states that boys and girls have different abilities (Borukova & Mavrudiev, 2020; Johnson et al., 2019), this occurs due to differences in the size of the upper and lower limbs (Petranek & Barton, 2011).

The reality of the results of this study and the discussion carried out according to Lawson et al., (2021), can be used as a basis for planning the process of strengthening movement development, especially in children aged 7–10 years. There are indications that there is a relationship between gross motor mastery and cardiovascular fitness (van der Fels et al., 2020).

## Conclusion

An investigation into the equality of gross motor skills between boys and girls in rural areas yielded insightful findings. This research explains that in rural communities, it turns out that children's gross motor skills between boys and girls tend to be the same. Despite living in the countryside, gross motor achievement tends not to be high. It becomes a reflection of whether the active lives of rural communities have decreased or whether physical education is unable to provide its services.

In conclusion, this study contributes valuable information to understanding gross motor skill development in rural settings. These findings can be instrumental in shaping strategies and interventions aimed at promoting equitable physical development between boys and girls in similar contexts. Further research and targeted interventions may be needed to address the identified disparities and improve the overall physical well-being of students in rural areas.

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