

# COMPARISON OF LOCOMOTOR AND MANIPULATIVE MOVEMENT ABILITY BASED ON HEIGHT IN ELEMENTARY SCHOOL CHILDREN

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## ABSTRACT

Locomotor and manipulative movements are basic movements that are important to be mastered at the age of 9-10 years because they can affect movement and play activities. The purpose of this study was to identify and compare the basic movements of children aged 9-10 years in the lowlands and highlands. This research is a comparative research with quantitative descriptive research with survey method. The results of the data that have been analyzed using the normality test in the lowlands obtained a significant value of  $0.064 > 0.05$ , then the data is normally distributed. The results of the analysis of the normality test in the highlands have a significant value of  $0.061 > 0.05$ , which means the data is normally distributed. The results of the homogeneity test got a significant value of  $0.890 > 0.05$ , so the data was homogeneous. Then continued with the difference test, obtained a significant value of  $0.004 < 0.05$ , which means that there is a significant difference. Based on the results of the analysis, it can be concluded that there are differences in locomotor and manipulative movements in the lowlands, which are lower than in the highlands.

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## 1. INTRODUCTION

Elementary school age children tend to be happier and do a lot of playing and moving activities. Every child must have basic movement abilities that are different from others. The development of basic motor skills is very important in children because it will greatly affect the development of more complex motor skills for an individual. Basic movement skills are the ability and skills of a child to perform a series of movements that involve various parts of the body and provide the basis for achieving competence to develop normally, maintain health, and gain excellence, basic movement skills are very important in children's physical development (Basman, 2019; Dobell, Pringle, Faghy, & Roscoe, 2020; Jones, Innerd, Giles, & Azevedo, 2020; Wick et al., 2017).

The important role of physical education is to strive so that students can develop their potential, especially in the context of physical or movement. It is hoped that with physical education in elementary schools, basic movement skills at elementary school age can develop better (Aristha, Saputra, Mahendra, & Salman, 2017; Demir, Soytürk, & Öztürk, 2021; Kalaja, Jaakkola, Liukkonen, & Digelidis, 2012). But in fact what is

happening today is that there are still some elementary school students who have difficulty in performing or practicing movement skills during physical learning, and it affects their playing activities.

Elementary school age children will spend more time playing with their peers in the neighborhood where they live. The environmental conditions in question are the altitude of the highlands and lowlands. Children's daily activities in each geographical environment will be different. Children who live in the highlands on a daily basis tend to pass through roads and environments that tend to go up and down due to geographical conditions. Meanwhile, children who live in the lowlands daily pass through roads and environments with geographical conditions that tend to be flat. Based on the results of research conducted by Rosyidi, (2015), Regarding the comparison of students' basic movement abilities based on geographical conditions, it was concluded that there were significant differences between basic movement abilities based on geographical conditions. Based on the results of research conducted Andita, et al. (2018), regarding the distance jumps of children aged 10 years in the lowlands, medium plains and highlands it was concluded that there were differences in the long jump skills of children aged 10 years in the lowlands with medium and highlands, the differences in jumping skills occurred due to differences in environmental conditions, in the highlands and medium environmental conditions have a slope, while in the lowlands it does not have a more rapid slope. The results of interviews and observations during physical learning that have been carried out by researchers, the hypothesis in this study is that there are differences in the locomotor and manipulative abilities of 3rd grade elementary school students in the lowlands and highlands. This study aims to determine the locomotor movements of children in the lowlands and highlands and compare the two to determine the differences in locomotor and manipulative movements of grade 3 elementary school students at SDN 1 Durenan in the lowlands and SDN 1 Pule in the highlands.

## 2. RESEARCH METHOD

This research is a comparative research with quantitative descriptive research with survey method. Sampling using purposive sampling in accordance with the objectives of the researcher, namely children in grade 3 elementary school (9-10) years. The test instrument uses the Test of Gross Motor Development-2 (TGMD-2) (Ulrich, 2000). Furthermore, the test data obtained is processed to determine the classification results obtained, after the classification results are obtained it will be presented as a percentage. To find out the percentage of student locomotor and manipulative test results classification, the following formula will be used (Sudijono, 2018).

$$P = \frac{f}{n} \times 100\%$$

Where  $P$  is percentage,  $f$  is frequency and  $n$  is number of samples or individuals. Then proceed with the normality test using Kolmogrov-Smirnov and homogeneity test using Levene. After going through the two tests, then a different test using the independent sample t-test.

## 3. RESULT AND DISCUSSION

### 3.1. Result

The results of the locomotor and manipulative movement tests between SDN 1 Durenan and SDN 1 Pule and the results of the comparison between the 2 schools are as follows:

Table 1. Results of Locomotor and Manipulative Movement Tests for Class 3 Students at SDN 1 Durenan in the Lowlands

No	Standard Score	Classification	Number of Students	Percentage
1	111-120	Above average	8	25.81%
2	90-110	Average	18	58.06%
3	80-89	Below average	5	16.13%

Based on the presentation of Table 1, and the pie chart above, it is known that the percentage results with the classification of locomotor and manipulative motion, the classification is above the average of 8 students (25.81%), an average of 15 students (58.06%), and below the average of 5 students (16,13%). Based on the description above, it can be concluded that the classification of locomotor and manipulative movements with TGMD-2 is dominant in 3rd grade students at SDN 1 Durenan, namely the average classification (58.06%).

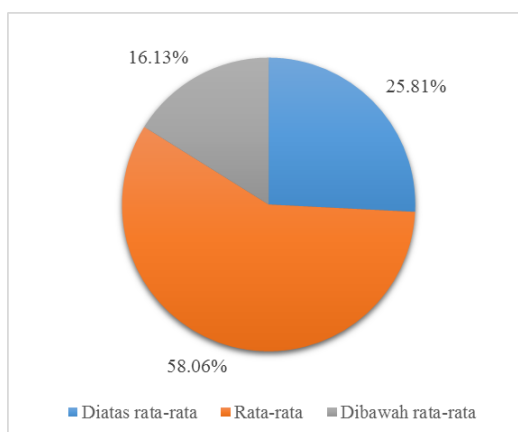


Figure 1. Pie Diagram of Locomotor and Manipulative Movement of Class 3 Students at SDN 1 Durenan in the Lowlands

Table 2. Results of Locomotor and Manipulative Movement Tests for Class 3 Students at SDN 1 Pule in the Highlands

No	Standard Score	Classification	Number of Students	Percentage
1	111-120	Above average	18	54.55%
2	90-110	Average	12	36.36%
3	80-89	Below average	3	9.09%

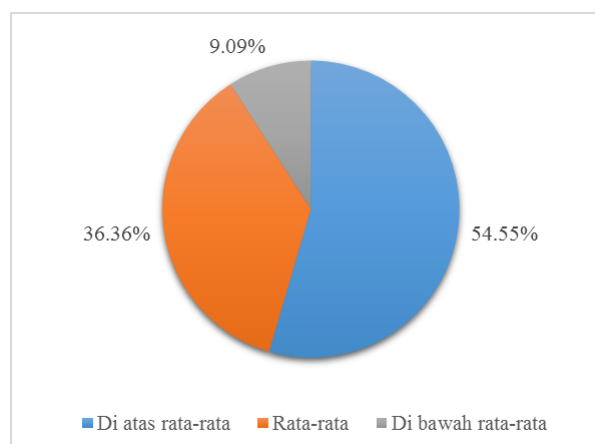


Figure 2. Pie Diagram of Locomotor and Manipulative Movements for Class 3 Students at SDN 1 Pule in the Highlands

Based on the presentation of Table 2, and the pie chart above, it is known that the percentage results with locomotor and manipulative motion classifications, the classification is above the average of 18 students (54.55%), an average of 8 students (36.36%), and below the average of 3 students (9.09%). Based on the description above, it can be concluded that the classification of locomotor and manipulative motion with TGMD-2 is dominant in grade 3 students at SDN 1 Pule, namely the classification above the average (54.55%).

Table 3. Results of the Locomotor and Manipulative Movement Normality Test for Grade 3 Students at SDN 1 Durenan in the Lowlands and SDN 1 Pule in the Highlands

<i>Test of Normality</i>				
<i>Kolmogorof-Smirnov</i>				
School	Statistic	df	Sig.	Information
SDN 1 Durenan	0.109	31	0.064	Sig > $\alpha$ 0.05 = Normal
SDN 1 Pule	0.097	33	0.061	Sig > $\alpha$ 0.05 = Normal

Based on Table 3, the results of the normality test with Kolmogorof Smirnov show that locomotor and manipulative movements of students at SDN 1 Durenan and SDN 1 Pule with information Sig > 0.05 = Normal.

Table 4. Results of Homogeneity Test of Locomotor and Manipulative Movements for Grade 3 Students at SDN 1 Durenan in the Lowlands and SDN 1 Pule in the Highlands

<i>Test of Homogeneity of Variances</i>				
<i>Levene Statistics</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>	<i>Information</i>
0.019	1	62	0.890	Sig > $\alpha$ 0.05 = Homogen

Based on Table 4 the results of the homogeneity test with Levene's test show that the locomotor and manipulative movements of grade 3 students at SDN 1 Durenan in the lowlands and SDN 1 Pule in the highlands > 0.05 = = homogeneous, it can be concluded that the data has a homogeneous variance or the same.

Table 5. . Locomotor and Manipulative Motion T-Test Results for Grade 3 Students at SDN 1 Durenan in the Lowlands and SDN 1 Pule in the Highlands

<i>Independent Sample T Test</i>							
<i>t-test for Equality of Means</i>							
<i>95% Confidence Interval of the Difference</i>							
<i>T</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Mean Difference</i>	<i>Std. Error Difference</i>	<i>Lower</i>	<i>Upper</i>	<i>Information</i>
-3.030	62	0.004	-6.120	2.020	-10.158	-2.083	Significantly Different
-3.029	61.662	0.004	-6.120	2.021	-10.160	-1.081	Significantly Different

The results of the Independent Sample T-Test showed that the differences in locomotor and manipulative movements of Grade 3 students at SDN 1 Durenan in the lowlands and SDN 1 Pule in the lowlands had a significant value (Sig. 2 tailed) worth  $0.004 < 0.05$ . Thus it can be concluded that there are significant differences in locomotor and manipulative movements of grade 3 students at SDN 1 Durenan in the lowlands and SDN 1 Pule in the highlands.

## 3.2. Discussion

### 3.2.1. Locomotor and Manipulative Movement of Grade 3 Students at SDN 1 Durenan in the Lowlands

Based on the results of the TMGD-2 analysis conducted on 3rd grade students of SDN 1 Durenan who are in the lowlands, the average classification is 48.38%. It can be interpreted that students have sufficient movement skills but still need attention and improvement because it is very important for children to be able to master basic movements better. Children in lowlands also tend to be less active in activities because with all the conveniences children are less involved in physical activity. In line with research results Sufitriyono & Yahya, (Sufitriyono & Yahya, 2020), Children in lowland areas tend to be more advanced, so that children rarely help their parents so that they have more opportunities to play and develop themselves, although now their growth and creative development are starting to be hampered due to the influence of technology. Children aged 3rd grade elementary school generally play and spend their time in the neighborhood. Daily activities carried out by students, both inside and outside school, also indirectly affect the level of movement ability of students living in their respective areas (Farida, 2016; Fitriani & Adawiyah, 2018; Murti, 2018).

### 3.2.2. Locomotor and Manipulative Movement of Grade 3 Students at SDN 1 Pule in the Highlands

Based on the analysis of the test results, the 3rd grade students of SDN 1 Pule in the highlands have an above average classification of 39.39%. Obtaining test results with a classification above the average is very appropriate. Good facilities make students familiar with the material and help in understanding what the teacher gives so that students become active. Children in highlands are more active in moving due to environmental factors or places of residence that tend to go up and down which require them to walk. This is in line with the research results Akbar, et al. (2019), there are differences or influences from students' daily activities based on the geographical side. An environment that is hilly or up and down will definitely make student activities more active than usual. Research results by Rosyidi (2015), shows that students tend to be more active in moving because of the remote place of residence, and the trails that go up and down make more activity than other areas. According to research results Anwar, et al. (2020), children in rural areas have more activity levels because they are not yet too matured by technology, therefore many children in villages still play traditional games that move a lot of body movements.

### 3.2.3. Comparison of Locomotor and Manipulative Movements of Grade 3 Students at SDN 1 Durenan in the Lowlands and SDN 1 Pule in the Highlands

The results of the 3rd grade locomotor and manipulative test results at SDN 1 Durenan in the lowlands with a dominant score of 48.38% as many as 15 students with an "average" classification. Meanwhile, the results of the locomotor and manipulative tests of 3rd grade students at SDN 1 Pule in the highlands had a dominant score of 39.39% as many as 13 students with the classification "above average". Then the comparison is continued with the t test which shows a significant value obtained, which is 0.017 which is smaller or less than the value of sig 0.05. Based on the data above, it can be concluded from these results that there are differences between the schools of SDN 1 Durenan in the lowlands and SDN 1 Pule in the highlands. In line with similar research Akba, et al. (2019), based on hypothesis testing with t test using the t-test formula and the results of t count = 4.71 while t table = 1.67 with a significant level of = 0.05 and dk = 36. The above explanation can be concluded that there are differences in children's gross motor movements based on geographic environment.

The above differences of course occur because it is influenced by several factors. The main factor is the difference in the living environment of the two schools. In line with opinion Febrialismanto (2017), several things that affect growth and development, one of which is the environment (nutrition, air quality, geographical location). To be able to achieve movement efficiency requires support from the elements of ability in the individual and the environment in which the individual lives (Bishop, 2014; Hamel & Pelphrey, 2009). According to Tepeli (2018), the geographic areas that differ in many characteristics will have different occasions for families and children, henceforth the physical activity that occurs will certainly affect the development of motor skills. It can be interpreted that different geographical areas in many characteristics will have different opportunities for families and children, henceforth the physical activity that occurs will certainly affect the development of motor skills. in line with Sani & Hartoto (2015) the results of his research found that the factors of daily activity in playing and learning became the differentiator in the motor component. According to research results Agustini, et al. (2016) there is an effect of traditional game practice on the results of students' basic movements.

Based on the explanation above, it is important for teachers to design varied learning and contain games that make students more active. In line with research results Kusumawati (2017) that learning that contains several games can improve students' movement skills. According to research results of Utama (2011), that through play activities are able to make students develop and improve their abilities in a positive direction. According to Bebeley, et al (2017) and Zhang, et al (2021), argues that educational institutions should pay attention to their students to take advantage of their free time to do activities or sports to increase student motivation.

## 4. CONCLUSION

Based on the description and analysis of the data above, the following conclusions can be drawn.

1. The results of the locomotor and manipulative tests of students at SDN 1 Durenan in the lowlands obtained dominant results with an "average" classification of 48.38%.
2. The results of the locomotor and manipulative tests of students at SDN 1 Pule in the highlands obtained dominant results with a classification of "above average" as much as 39.39%.

3. There is a significant difference between SDN 1 Durenan which is located in the lowlands and SDN 1 Pule which is located in the highlands. The locomotor and manipulative movements of SDN 1 Pule in the highlands are better than SDN 1 Durenan in the lowlands.

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