



COMPARISON OF PHYSICAL ACTIVITY BASED ON TOPOGRAPHY OF THE HIGHLAND AND LOWER PLAINS IN CHILDREN AGED 3-5 YEARS IN MALANG RAYA

Sukma Nur Hanifah¹, Dona Sandy Yudasmar¹, Laras Putri Gamagita²

¹*Faculty of Sport Science, Universitas Negeri Malang, Malang, Indonesia*

²*Faculty of Medicine, Universitas Negeri Malang, Malang, Indonesia*

Email Co-Author: sukma.nur.2001616@students.um.ac.id

Abstract. This study aims to identify the physical activity of children aged 3-5 years in highland and lowland areas using a survey method by looking at a picture of the physical activity situation in children over one week or seven consecutive days using the Global Physical Activity Questionnaire (GPAQ). In this study, 65 respondents would be the research sample and the sample determination used Nonprobability Sampling where each population would get the same opportunity to become respondents. Still, there were criteria in sampling, namely inclusion and exclusion criteria. Apart from that, a willingness sheet was given and filled out by parents to strengthen eligibility for research. The research subjects involved children aged 3-5 years in the highlands and lowlands with a sample size of 21 in each region. Data from the two areas shows a significant p-value (sig. 2-tailed) of $0.003 < \alpha 0.05$. This result means that there is a comparison that differentiates physical activity in children aged 3-5 years in the highlands and lowlands.

Keywords: Physical Activity, Children, GPAQ

1. INTRODUCTION

Physical activity is an easy step in maintaining physical, social, and cognitive health during children's growth and development [1]. Early childhood is a critical period in providing stimulation to achieve optimal development. Children under five are considered to have characteristics and experience rapid growth in cognitive, affective, and psychomotor functions [2]. From a pedagogical perspective, early age is the initial foundation or determinant of the success of their growth and development in the future [3].

Regarding characteristics, geographical conditions are divided into lowlands and highlands [4]. The highlands tend to have a cold climate, and there are not many tall buildings or buildings that are useful for expanding space for movement. They can unconsciously improve

physical fitness in children aged 3-5 years [5]. Children aged 3-5 years who live in the highlands tend to do more physical activities because environmental conditions require them to do many things. However, at present, many children aged 3-5 years or in early childhood do not achieve maximum physical condition, coupled with the lack of parental understanding of the importance of fulfilling children's nutrition for growth and development [6].

In contrast to children aged 3-5 years who live in lowland areas, especially urban areas, they have more spontaneous physical activity in open spaces and use more outdoor fields. In addition to other environmental factors, parents must consider this as an intervention to increase physical activity and health in their children. Changes in these habit patterns instilled by some parents in children in lowland areas, especially urban areas, have decreased physical activity [7].

East Java Province, especially Malang City and Regency, has several categories of areas, including high and low plains. The highlands located in the Batu City area with an altitude of 892-1800 meters above sea level and the lowlands located in the Malang City area with an altitude of 440-667 meters above sea level according to the Batu City and Malang City Statistics Agency. Differences in environmental conditions will impact the sustainability of the scope of movement in children aged 3-5 years in the area. Physical activity patterns in children will be required to adapt to their surroundings [8].

Place of residence is part of differentiating the results of children's physical activity levels, especially those aged 3-5. Physical activity in early childhood cannot be underestimated, in addition to internal family factors, there are external factors as a form of strategy for the success of physical activity abilities as a support for life in the future. Differences in physical activity ability are found in other factors, namely geographical or place of residence by 24% and 14% in scope, facilities, and infrastructure (Specht, Nielsen, et al., 2022). Other results also revealed that overweight and obesity have increased due to lack of physical activity [8]. Different geographic areas affect the characteristics and opportunities for children's physical activities, especially children aged 3-5 years, so their activities will affect their motor development. In another reality, children aged 3-5 years who live in different places in the highlands cannot be said to be good at fulfilling their movements, children who are in the lowlands also still need more attention in fulfilling their movements, especially in the current era of globalization and technology. It can be interpreted that different geographic areas will

have different opportunities, and daily activities will certainly affect the development of their motor skills [9].

2. METHOD

This study uses a survey method with a quantitative descriptive approach to observe the description of physical activity in the highlands and lowlands in children aged 3-5 years in Malang Raya with an altitude of 892-1800 meters above sea level in the highlands and lowlands with an altitude of 440-667 meters above sea level according to the Statistics Agency of Batu City and Malang City. The instrument used by the researcher was a Global Physical Activity Questionnaire (GPAQ) questionnaire given to parents or guardians which was carried out and accumulated over one week consisting of 16 questions [10].

In this study, 65 respondents would be the research sample and sample determination. An informed consent sheet was given and filled out by parents to strengthen the eligibility of each respondent or sample in the study [11]. In addition, there are certain criteria in this study, namely inclusion criteria with the requirements (1) children aged 3-5 years, (2) physically healthy, (3) filling out the informed consent form, and (4) located in the highlands and lowlands. In addition to the inclusion criteria, there are exclusion criteria, namely, (1) does not apply to children aged 3-5 years who are in health recovery and treatment, (2) have a history of relapsing illness.

Data classified as willing to become respondents is a description of the sampling that will be observed and data that is not willing to become respondents is not a sample in the study. Based on the criteria followed by the researcher and the willingness sheet filled out by the child's parents, 42 respondents were willing to become samples in the study in both areas. The respondents were 21 children in the highlands and lowlands, especially in TK & KB Hudan Cendekia and TK & KB 01 Batu. This study uses an ethical test with Reg.No: 618 / KEPK-POLKESMA / 2.

The data obtained from the parents of students were then tested for normality and homogeneity using the Kolmogorov-Smirnov test with levels ($p > 0.05$) and ($p > 0.05$), data that were normally distributed and had homogeneous variances would be continued for the Mann Whitney test with a level ($p < 0.05$) using the SPSS version 25.0 application to determine the comparison of physical activity in each group

3. RESULTS AND DISCUSSION

3.1 Result

Table 1 respondent characteristics by gender.

Variable	Highland			Lower Plains		
	Σ	%	Mean \pm SD	Σ	%	Mean \pm SD
Gender						
Male	15	55.5	2301.3 \pm 512.8	12	44.4	2713.3 \pm 621.1
Female	6	40	2183.3 \pm 467.2	9	33.3	2924.4 \pm 464.2

Based on the data above, the researcher obtained data in both areas, namely the highlands and lowlands with a total of 42 respondents (100%). In each region, 21 children (50%) were in the highlands, and 21 children (50%) were in the lowlands. In both areas, there were male respondents with a total of 27 people (64.3%) a total of 12 children in the highlands and 15 children in the lowlands, and 15 female respondents (35.7%). In the highlands, there are 9 children, and 6 children are in the lowlands. The age data that became the subject of the researcher showed a total of 13 children (30.8%) for the age of 3 years, 19 children (45.2%) for the age of 4 years, and 10 children (24%) for the age of 5 years.

Table 2 Respondent Characteristics By Age.

Variable	Highland			Lower Plains		
	Σ	%	Mean \pm Sd	Σ	%	Mean \pm Sd
Age (years)						
3,0 - 3,4	2	9.5	146. \pm 150	2	9.5	2480 \pm 80
3,5 - 3,8	2	9.5	1386.6 \pm 680	2	9.5	2160 \pm 720
3,9 - 3,11	4	19	1764 \pm 274.3	2	9.5	2460 \pm 300
4,0 - 4,4	3	14.2	2000 \pm 539.6	0	0	0
4,5 - 4,8	3	14.2	1986.6 \pm 265.4	5	23.8	3044 \pm 546.7
4,9 - 4,11	3	14.2	2380 \pm	4	19	2775 \pm

			537.4			266.5
5	4	19	2790	±	6	28.5
			321.7			3060
						±
						552.2

Table 3 respondent characteristics by activities, intensity.

	Highland			Lower Plains		
Activities						
daily	21	100	1340 ± 544.2	21	100	1398 ± 345.0
travel	18	86	468.5 ± 289.0	19	90.5	635.2 ± 290.1
sport	20	95.2	420.9 ± 307.5	21	100	765.7 ± 347.6
Intensity						
high	2	9.5	3220 ± 100	7	33.3	3442.8 ± 197.2
mediu m	19	90.5	2167 ± 4160.1	14	66.7	2484.2 ± 399.8
low	0	0	0	0	0	0

Physical Activity in Highlands and Lowlands Based on Activity, Category, and Age.

The study showed 21 regional samples based on activity, category, and age. In the highlands, daily activities with a frequency of 21 (100%) mean value ± sd 1340 ± 544.2, a frequency of 18 (86%) in travel activities with a mean value ± sd 468.5 ± 289.0, a frequency of 20 (95%) in sports activities with a mean value ± sd 420.9 ± 307.5. Different conditions in the results of the study in the lowlands. Frequency 21 (100%) mean value ± sd 1398 ± 345.0, frequency 19 (90.5%) in travel activities with mean value ± sd 635.2 ± 290.1, frequency 21 (100%) in sports activities mean value ± sd 765.7 ± 347.6.

The results of the study based on categories in both regions showed that in the highland region with a frequency of 2 (9.5%) high category with a mean value ± sd 3220 ± 100, frequency 19 (90.5%) medium category with a mean value ± sd 2167 ± 4160.1. In the lowland area with a frequency of 7 (33.3%) in the high category with a mean value of ± sd 3442.8 ± 197.2, a frequency of 14 (66.7%) in the medium category with a mean value of ± sd 2484.2 ± 399.8. Both areas show a frequency of 0 in the low category and a value of 0 in the mean ± sd.

Based on the age category in each region, the highland area shows a frequency of 8 (38.2%) in children aged 3 years with a mean value of ±

sd 2170 ± 402 , a frequency of 9 (42.8%) in children aged 4 years with a mean value of \pm sd 2122 ± 500 , a frequency of 4 (19.0%) in children aged 5 years with a mean value of \pm sd 2790 ± 321.7 . Conditions in lowland areas with a frequency of 6 (28.6%) in children aged 3 years with a mean value of \pm sd 2366.6 ± 475.7 , a frequency of 9 (42.8%) in children aged 4 years with a mean value of \pm sd 2924.4 ± 464.2 , a frequency of 6 (28.6%) in children aged 5 years with a mean value of \pm sd 3060 ± 552.2 .

Table 4 Comparative Distribution Of Physical Activity

Variable	Highland	Lower Plains
N	21	21
Range Score (Min \pm Max)	1320 \pm 3320	1440 \pm 3840
Mean \pm SD	2267.6 \pm 515.5	2799 \pm 578.6
Normality (p-value)	0.200 > α 0.05 = physical activity data is normally distributed	
Homogeneity (p-value)	0.663 > α 0.05 = physical activity data is homogeneously distributed	
p-value (sig. 2-tailed)	0.003 < α 0.05 = there is a comparison or difference in physical activity data	

The data above shows the comparative distribution in both regions with 21 samples each. The highlands show a range score (min \pm max) of 1320 ± 3320 and a mean \pm sd of 2267.6 ± 515.5 . The lowland area has a range score (min \pm max) of 1440 ± 3840 and a mean \pm sd of 2799 ± 578.6 . Based on these data, the calculation of the normality and homogeneity test (p-value) shows $0.200 > \alpha 0.05$ and $0.663 > \alpha 0.05$, so from these results, it can be interpreted that the physical activity data is normally and homogeneously distributed. The data from both regions showed a significant p-value (sig. 2-tailed) of $0.003 > \alpha 0.05$. From these results, it can be interpreted that there is a comparison that differentiates physical activity in children aged 3-5 years in the highlands and lowlands.

3.2 Discussion

The study showed that physical activity in the highlands and lowlands had different results. In daily activities carried out by children in the lowlands, the results tended to have a relatively high-intensity duration compared to children in the highlands. Research studies state that differences in place of residence are differentiators of physical activity results due to factors such as infrastructure, terrain, and different environmental conditions also affect the results of physical activity [12].

Lowland environmental conditions have many external media that can be used for physical activities, while in the highlands they adapt to the conditions of the surrounding environment. Based on differences in topography, the results state that children in highland areas tend to pay less attention to the scope of movement carried out by children. Environmental conditions that are close to highways require them to look for other alternatives to increase the scope of movement, especially in children's physical activity [13]. In addition, environmental characteristics are one of the factors that are correlated with differences in physical activity carried out by children [14].

Lowland environments have many flat roads so some parents get their children used to walking or cycling on travel activities. The study's results also stated that parents of children are involved in physical activities in their daily activities. Cycling and walking are alternatives carried out by parents in the afternoon and on weekends. This is also correlated with environmental conditions that support activities. Different conditions for some parents in highland areas who tend to use vehicles when moving places such as to school, and playgrounds because of the up and down environmental conditions [15]. Sports activities carried out by children in the highlands and lowlands are one of the reasons for increasing physical activity. The results of the study of sports activities in the lowlands tend to be higher compared to the highlands. The availability of facilities and infrastructure in each region makes a difference in the elements of sports carried out by children [16]. Outdoor media or open spaces are important in increasing children's physical activity [17].

Based on the results of the study, highland areas tend to have less open space that can be accessed by the surrounding community. Parents tend to use road media or open spaces are important in increasing children's physical activity [17]. Based on the results of the study, highland areas tend to have less open space that can be accessed by the surrounding community. Parents tend to use road media with existing conditions in daily activities to increase movement in children [18]. In different conditions in lowland areas, parents utilize open spaces such as housing parks and mini playgrounds to encourage children to move actively. In addition, many parents invite their children to cycle around the housing complex in their free time in the afternoon. The difference in activity results in the two areas is not only due to differences in environmental conditions parenting patterns and parental habits. According to the Theory of Planned Behavior, sedentary behavior can be at home in the role of the family or the habits of family parenting

patterns that intend to change require more exploration related to preventing sedentary lifestyles in children [19].

4. CONCLUSION

Children's activities need to be a concern in today's era to support their future life. Data from both regions show a comparison that differentiates physical activity in children aged 3-5 years in the highlands and lowlands. Differences in physical activity levels in children aged 3-5 years in the highlands and lowlands are triggered by several factors including gender, residential status, parenting patterns, and sedentary behavior carried out by children. This must be a concern for parents and teachers in increasing physical activity in children for the future life of children. Many steps can be taken to increase activity in children, utilizing media available at home, getting children used to physical activity, and reducing children playing cell phones and online games. Good physical activity in children cannot be seen from one factor but from various sides, therefore further research should not focus on elements of physical activity but many elements that can be studied especially in children aged 3-5 years such as passive activities, motor skills, social-emotional development, etc. to increase insight for readers and education for parents in increasing physical activity in children.

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