

Time Patterns of Physical Activity for 1st Grade to 6th Grade Students Living in the Lowland Area

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Abstract— The purpose of this study was to determine the physical activity period of students in grade 1 to 6 in SD Negeri 1 Bantur. The study design used was cross sectional, using stratified proportional random sampling. The results of data analysis using non-parametric statistics with the Kruskal-wallis test showed the number of 113,380 with a significance level of $.000 < 0.05$ indicated that H_0 was accepted and H_1 was rejected. The results of the normality test for one class were normally distributed, then the Kruskal test was significant as much as $.000 < 0.05$, meant that it had a mean difference in groups. The results of further data analysis using the Mann-whitney test revealed that the results of class 1 and class 2 had a significance of $.001 < 0.05$, then class 2 and 3 had a significance of $.000$, next class 3 and 4 had a significance of $.004$, while class 4 and 5 had a significance of $.000$, and finally grade 5 and 6 had a significance of $.040$. Thus, H_0 was accepted and H_1 was rejected. Based on the results of the study, it could be concluded that each class gap had a different amount of activity time

Keywords— *physical activity time, lowland area, elementary school students*

I. INTRODUCTION

Humans are living things that have changed from time to time. Naturally, the growth and the development of individuals in this particular case is an evitable development because it will continue to run naturally, and the most important thing is how to understand the stages of development, in physical, intellectual, emotional, attitude and even moral development [1]. Human growth has occurred since infant was in their mom's womb. Development must be passed step by step in each developmental phase, starting in the womb, infants, children, teens, adults, and the elderly, as each phase will affect the next phase [2]. Moreover, changes in individual development are the result of biological and cognitive processes. Biological processes include changes in the physical individual. As they get older, it will lead to maturity. In addition, cognitive processes include changes in individual thought patterns, intelligence, and language.

Motion is something essential for humans. The development of children's movements is important for the

child's overall growth and development. Environmental factors, family, economic status, educational status of the mother can obviously affect the child's motoric development [3]. Understanding of human development must be well conceived in order to avoid interference that can inhibit developmental factors [4]. In this phase human motor development starts from the physical aspect, which includes body movements that generally go through 4 stages, namely; the unconscious movement, the unclosed movement, the undifferentiated movement, and the increasingly developing movement [5].

The development of motion goes hand in hand with the growth of motion. The ability to develop gross motor movements is determined by the level of age, sex, development of muscle strength, bone, and muscle coordination to maintain body balance [6]. Gross motor coordination skills include endurance, speed, flexibility, strength, dexterity, and balance. Motor development at these ages covers the development of muscles from the elements of controlling body movements which coordinate with the brain in carrying out a coordinated activity on the arrangement of nerve and muscle maturity [7]. Gross motor skills are divided into three parts namely, locomotor, non locomotor, and manipulative. Locomotor movements include walking, running and jumping. While non locomotor movements cover crouching, grasping, and turning the body. Then, manipulative movements include throwing, catching, and kicking. Motor skills develop in line with the maturity of the muscle nerve.

Physical education subject in the scope of education must be adjusted to the physical condition of students. In the scope of primary school, it cannot be equally compared to junior high school or high school. All is given according to the ability, the physical condition and the ability of the children's body. At present, physical education is underestimated due to the lack of understanding of the awareness of the importance of physical education. The reality of the physical education learning process is still static and monotonous, which results in the decline of students in gaining knowledge. Thus, the recommended learning process is that physical education learning which is fun oriented that students are active in movement activities, and they relish it.

The expansion of era has led to changes in various fields of education, economy, social culture, and followed by technological advances. With the rapid development of the era and technology, today's society including children have been very spoiled by the progress of this easiness. Based on the results of a survey conducted by the Ministry of Communication and Information of the Republic of Indonesia in 2017, internet usage in Indonesia reached 143.26 million users from the total population of Indonesia as many as 262 million people and as much as 16.68% of users were teenagers whose age range from 13-18 years old. Referring from the data above, we could recognize that the activity of children's movement in Indonesia is diminishing due to the internet and smartphones. Various facilities obtained from the advancement cause people to consciously or unconsciously experience changes in behavior patterns. In addition, this ease of using technology results in the lack of children's physical activity. Moreover, the ease of transportation also tends to result in people moving less or using less energy for daily activities.

Bantur is a sub-district located in Malang Regency, which in general the community in the Bantur village works as traders and farmers. The low-lying area that is very close to the coast is the target of researchers to conduct research on the physical activity time of students from grade 1 to grade 6 at SD Negeri 1 Bantur. Based on the results of observations made by researchers, the characteristics of children at elementary school age were very fond of moving and playing. Walking, jumping and running were the very visible habits of the children when at school. During the PE lesson, the students looked active during the learning process. However, the minimal time in the learning process of PE made the children's physical activity a little limited by time. Within a week, they only got 3 hours of intensive physical activity lessons. The lack of physical activity undertaken by the students could also be seen when the students went to school. The ease of transportation today made students more often dropped off by their parents by vehicles even though the actual distance between home and school was not too far. The increasing development of technology also made the students' motion activity decrease since their most time was spent for playing gadgets. From the results of small talks with several pupils at SD Negeri 1 Bantur, it turned out to be true that children preferred to play gadgets rather than played with friends which included physical activities as they came home from school.

The development of physical activity of elementary school students with the average range of 7-12 years stated that physical activity must be adjusted to the age level starting from the age period of 7-12 years [8]. By providing physical activity appropriate to their age period, it is expected to have a good impact on physical growth and optimal emotional development. Furthermore, patterns of physical activity of children aged 6.0-12.9 years had differences. Half of the study samples were inactive and they tended to watch TV and play computer / PlayStation two hours per day. The level of inactivity was more in males and the level of urban inactivity was higher than that of rural areas [9]. The high level of interaction in the use of mobile phones more than three hours per day tended to make elementary school age students became lazy and do not pay attention to lessons, since mobile phones were also one of the

causes of children's high ignorance level towards their surroundings [10]. In relation with the physical activities of elementary school students in grade 1 to grade 6, researchers conducted research on the physical activities of students in SD Negeri 1 Bantur starting from going to school, movement activities at school and children's daily activities at home.

II. METHOD

This study used a survey method using a cross sectional approach. This research occupied a questionnaire that was given to teachers to observe the activities of children at school and to parents to find out the physical activities carried out by students when at home. The population used in this study was 204 students with the details of 108 students and 96 students of SD Negeri 1 Bantur who settled in the lowland area. Researchers took a sample of 135 children including students from grade 1 to grade 6. The research instrument used was a non-test technique using a questionnaire. The validity of this instrument referred to the results of research conducted by [11] this study showed a correlation coefficient of 0.82 which indicated the satisfactory reliability of the PAQ-C score. Analysis of the data used was a formula to find out the percentage of student activity (Sudijono, 2008). Then, it was adjusted to the percentage criteria table according to its classification [12]. After that, the data were processed again to determine the level of difference of each grade level by using a non-parametric test which contained a normality test, a kruskal-wallis test and a mann-whitney test. The decision rule used to reject H0. Next, H1 was accepted if the H value > f_{X2cr} value.

III. RESULTS

A. Time Percentage of Students' Physical Activity at School

Students in grade 1 - 6 of SD Negeri 1 Bantur had distinct characteristics. Activities carried out in daily life were also diverse. In this study the physical activities of students were divided into two, namely; physical activity at school and physical activity at home. This research was aimed at examining students of SD Negeri 1 Bantur and the sample in this study was 135 people. Physical activity of children at school and at home as well as non-parametric test result data will be presented in the following table:

TABLE I. TIME PERCENTAGE OF STUDENTS' PHYSICAL ACTIVITY AT SCHOOL

<i>Students' Grade</i>	<i>Total Students</i>	<i>Time Average</i>	<i>Maximum Time</i>	<i>Minimum Time</i>
1	25	972.96	1022	876
2	26	959.64	1017	856
3	18	1455.39	1509	1348
4	23	1518.39	1569	1443
5	21	1571.43	1709	1488
6	22	1555.23	1610	1480

Based on the results in Table 4.2 it could be explained that the average physical activity time of grade 1 students was 972.96, for grade 2 students was 959.64, for grade 3 students was 1455.39, then for grade 4 students was 1518.39, next grade 5 students was 1571.43, and finally grade 6 students was

1555.23. The following is a graph of the average physical activity time of students in the school environment:

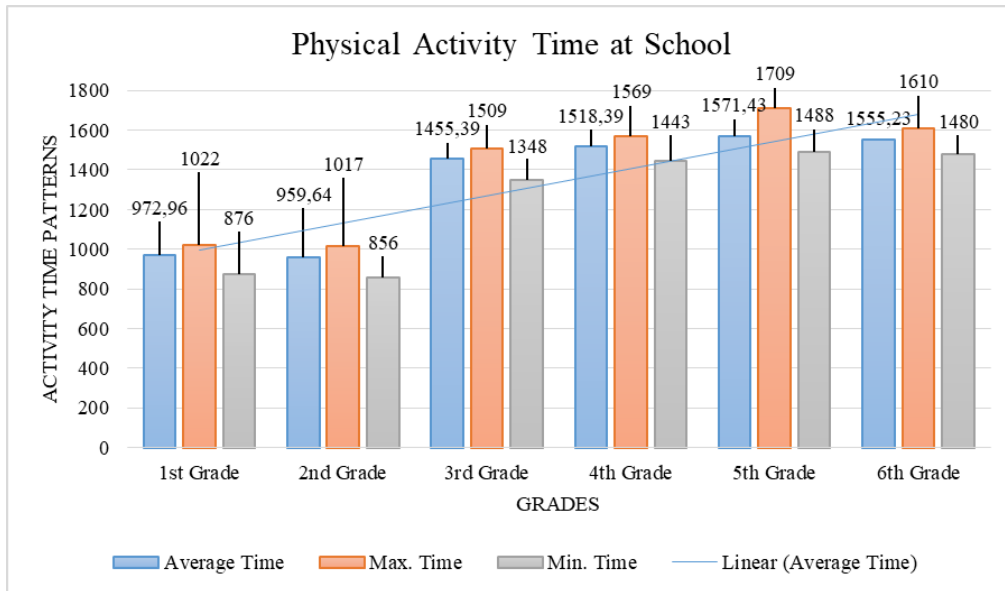


Fig 1. Bar Chart of Physical Activity Time Average at School

B. Table of Time Percentage of Students' Physical Activity at Home

Students' Grade	Total Students	Time Average	Maximum Time	Minimum Time
6	22	1261.318	1577	898

TABLE II. PHYSICAL ACTIVITY OF GRADE 1 STUDENTS AT HOME

Students' Grade	Total Students	Time Average	Maximum Time	Minimum Time
1	25	904.44	1067	786
2	26	981.36	1034	903
3	18	1016.167	1257	908
4	23	1062.696	1334	868
5	21	1175.476	1396	882

Based on the results in Table 2, it could be elaborated that the average physical activity time of grade 1 students was 904.44, for grade 2 students was 981.36, then for grade 3 students was 1016.167, next for grade 4 students was 1062.696, for grade 5 students was 1175.476, and grade 6 students was 1261.316. The following is a graph of the average physical activity time of students at home:

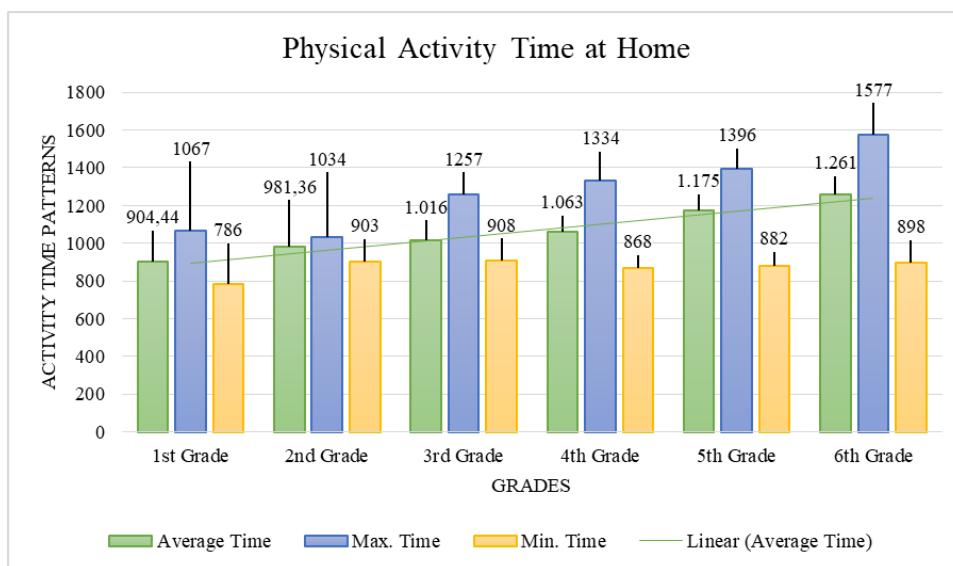


Fig 2. Bar Chart of Physical Activity Time Average at Home

C. Non-Parametric Test Results

In the results of data analysis in this study would be presented data in the form of: (1) normality test results using the shapiro-wilk technique, (2) kruskal-wallis test results and in the final stage would be presented (3) the results of the mann-whitney test.

TABLE III. NORMALITY TEST RESULTS

Students' grade	Shapiro-wilk			Notes
	Mean	SD	Sig	
1	1877,40	82,664	,740	Normal
2	1942,73	44,218	,002	Not Normal
3	2451,89	98,781	,858	Normal
4	2581,09	143,826	,255	Normal
5	2746,90	133,163	,516	Normal
6	2816,55	151,980	,051	Normal

Based on the results of the normality test using the Shapiro-Wilk technique in Table 3, the results of testing at grade 1, grade 3, grade 4, grade 5 and grade 6 had normal distributions. While only grade 2 had a non normal distribution..

TABLE IV. KRUSKAL-WALLIS TEST RESULTS

	Students' Time Activity Data Results
Chi-Square	113.380
Df	5
Asymp. Sig.	.000

Based on Table 4, the kruskal-wallis test results obtained statistical description of each level of significance class .000 <0.05. With this result, it could be said that the average group between grade levels starting from grade 1 to grade 6 at SD Negeri 1 Bantul had differences.

TABLE V. MANN-WHITNEY TEST RESULTS OF PHYSICAL ACTIVITIES OF EACH GRADES

Students' Grade	Non-Parametric Analysis	Value
1 & 2	Mann-Whitney	149.500
	Wilcoxon W	474.500
	Z	-3.307
	Asymp. Sig.	.001
2 & 3	Mann-Whitney	.000
	Wilcoxon W	351.000
	Z	-5.586
	Asymp. Sig.	.000
3 & 4	Mann-Whitney	97.000
	Wilcoxon W	268.000
	Z	-2.890
	Asymp. Sig.	.004
4 & 5	Mann-Whitney	89.500
	Wilcoxon W	365.500
	Z	-3.572
	Asymp. Sig.	.000
5 & 6	Mann-Whitney	146.500
	Wilcoxon W	377.500
	Z	-2.053
	Asymp. Sig.	.040

Based on the results of the mann-whitney test in Table 5 above, it showed sig .001 which meant .001 <0.05. So it could be concluded that there were differences in the average time of physical activity undertaken by grade 1 students and grade 2 students. For 2 and 3 graders, it revealed sig .000 which meant .000 <0.05. Thus, it could be said that there were also differences in the average time of physical activity undertaken by thus grades. For 3 and 4 graders, the sig was .004 which meant .004 <0.05. So there were differences in the average time of physical activity undertaken by thus grades as well. For 4 and 5 graders the sig valued was .000 which meant .000 <0.05. It revealed that there were differences in the average time of physical activity carried out by 4th grade students and 5th grade students. The last, for the 5 and 6 graders the sig was .040 which meant .000 <0.40. In conclusion, there were differences in the average time of physical activity undertaken by thus graders.

IV. DISCUSSION

Bantul Village, in Bantul Sub-district, Malang is an area close to the coast. The majority of people work as farmers, traders and fishermen. Malang Government Portal stated that it is located between 0-300 meters above sea level. Lowland is an area whose road conditions tend to be straight, flat and close to coastal areas. Environmental factors according to the altitude level of the area cause differences in students' activities. Primary school-age children have different characteristics. The age category is included in the elementary school level. At this age, pupils are very active in activities that contain movable elements. Students aged 7-12 years have characteristics that like to play, move, group and do hands-on practice [13]. SD Negeri 1 Bantul has 204 students and 135 students were taken as research samples. Physical activity of the students was very active when at school, all activities undertaken entirely using motion activities. The current application of school-based physical activities gives the positive effects on behavior and one measurement of physical health status [14]. It could be seen from the activities done in the classroom, physical education subjects and when in free time or break time. Physical education subject was very preferred by students because it carried out activities with movement and playing. Maximizing the time of child movement activities properly can have a positive effect. The management of physically active lessons not only improves physical and mental health, but can stimulate and increase the involvement of students' behavior in learning also [15]. The teacher is the role model in this physical education learning activity. The role of physical education teachers in the learning process can shape the characteristics of students who are disciplined, honest and fair [16]. Creativity regarding the learning concepts to be used must be carefully deliberated and in accordance with the character of students in SD Negeri 1 Bantul. Game-based motion learning activity models are suitable to be used in Physical Education subject especially in elementary school level [17].

In addition to physical education subjects, leisure time such as break time was also very popular among students because

they could do various activities. The overall picture of how students spent their free time was based on their favorite activities. Sports or motion activities were also favorites when students had free time [18]. Utilization of free time was used by surfing on the internet or exercising (soccer, basketball and badminton) according to their interests. Almost all of the break time was used to do movement activities [19].

Not only outside the classroom, students also actively moved inside the classroom. Even when in class there were some children who still preferred to walk around, jump, or run. The presence of several practices at school could double the physical activity of children while at school [20]. This could illustrate that children aged 7-12 years did not have fatigue because of the high intensity of movement. When students experienced a little fatigue, their activity would increase to be fully active or almost normal [21]. Nevertheless, the activity of male and female students was different. The time of physical activity undertaken by male students had significantly different differences in than female students [22].

Characteristics of students at SD Negeri 1 Bantul were very fond of moving and playing. The free time was used for playing, buying food and so on. Activities of children of this age indeed liked hands-on activities. In addition, students' movement activities were mostly done during periods of outdoor play [23]. However, the reality showed that at SD Negeri Bantul, there were still some students who preferred to play gadgets rather than to play using physical activity and it turned out that this could reduce students' movement activities. Introducing internet-connected gadgets could absolutely reduce the intensity of students' physical activities [24]. Supervision needs to be done by parents so that children do not over-use gadgets. Parents have an important role in the development of their children. Supervision and guidance of parents to children must always be done when children linger to play gadgets, so that the child's role in the future is going to be better [25]. The use of gadgets has two positive and negative views. The use of gadgets has positive impacts such as adding foreign language vocabulary and honing intelligence in completing a stage in the game. While, the negative impact is children will be more reserved and busy to play gadgets than playing with friends [26]. In addition to the negative impact, it is true that excessive use of gadgets can disrupt children's social interactions with the surroundings [27].

The role of parents must always be implemented so that children are not too dependent on technology, which is currently developing very rapidly. Parents should partake in the physical activity of children and the physical activity used should change from time to time. Parents can spend 60 minutes per week doing physical activities with their children [28]. In this case the role of parents is vital to give conception to the child that physical activity is very essential than the less active movement (sedentary). Parents can influence children to like to move by facilitating them in the field of physical activity for parents and the environment are factors that can affect the child's motion activity [29].

V. CONCLUSION

Based on the results of the research that has been done and several stages of data processing that have been carried out, it could be concluded that each grade level starting from grade 1 to grade 6 in SD Negeri 1 Bantul had a difference in physical activity time when at school and at home.

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