

The Effect of Anthropometry and Physical Activity toward Elementary School Students' Interest in Learning Sport

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Abstract: The Effect of Anthropometry and Physical Activity toward Elementary School Students' Interest in Learning Sport. **Objective:** The current study aimed to determine the effect of anthropometry and physical activities toward sport learning interest of elementary school students. **Methods:** The cross-sectional survey research design was applied in this study with 137 elementary students from two Islamic elementary schools in Pringsewu regency, Lampung as research sample. Moreover, descriptive statistics, inferential statistics, and multiple linear regression with product moment correlation coefficient used to analyze and interpret the data. **Finding:** there was no significant effect of anthropometry toward learning interest ($\text{sig} > 0.05$), however physical activity performed different effect ($\text{sig} < 0.05$). Moreover, a positive and significant effect of anthropometry toward physical activity was found and the combination of both showed the positive effect towards students learning interest. **Conclusion:** It exist a strong and signification effect of anthropometry and physical activity toward students' interest in learning sports of elementary school students.

Keywords: anthropometry, physical activities, learning interest, elementary school student.

Abstrak: Pengaruh Antropometri dan Aktivitas Jasmani terhadap Minat Belajar Olahraga Siswa Sekolah Dasar. **Tujuan:** Penelitian ini bertujuan untuk mengetahui pengaruh antropometri dan aktivitas fisik terhadap minat belajar olahraga siswa sekolah dasar. **Metode:** Desain penelitian survei cross-sectional diterapkan dalam penelitian ini dengan 137 siswa SD dari dua Madrasah Ibtidaiyah di Kabupaten Pringsewu, Lampung sebagai sampel penelitian. Selain itu, statistik deskriptif, statistik inferensial, dan regresi linier berganda dengan koefisien korelasi product moment digunakan untuk menganalisis dan menginterpretasikan data. **Temuan:** tidak ada pengaruh yang signifikan antropometri terhadap minat belajar ($\text{sig} > 0,05$), namun aktivitas fisik memberikan pengaruh yang berbeda ($\text{sig} < 0,05$). Selain itu, ditemukan pengaruh positif dan signifikan antropometri terhadap aktivitas fisik dan kombinasi keduanya menunjukkan pengaruh positif terhadap minat belajar siswa. **Kesimpulan:** Terdapat pengaruh yang kuat dan signifikan antropometri dan aktivitas fisik terhadap minat belajar olahraga siswa sekolah dasar.

Kata kunci: antropometri, aktivitas fisik, minat belajar, siswa sekolah dasar.

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■ INTRODUCTION

Physical education (PE) educates human beings to approach the perfection of life naturally that can make a real contribution to life (Giese & Ruin, 2018). A learning program designed for physical fitness, knowledge, and active life behavior and sportsmanship (Rokhayati, 2016; Wicaksono & Utama, 2020). Body management advance self-management skills to develop and maintain physical fitness and a healthy lifestyle through a variety of physical activities and selected sports to advertise better physical growth and psychological advancement (Ghahari et al., 2019). Sport learning is systematically structured through physical activity as a medium for achieving educational goals and the application of physical education in schools has an important role formation of whole person (Ghahari et al., 2019; Wicaksono & Utama, 2022). Fundamentals of health, physical fitness, critical thinking, emotional health, social skills, and reasoning are all developed by physical workers, and each of these characteristics encourages kids' enthusiasm in physical learning (Ullrich-French et al., 2012).

The interest in learning is very important to its influence on the learning process (Syafruddin & Sutriawan, 2022). On the contrary, low student interest can create difficulties for the learning process of the learner. As a psychiatric aspect, interest can not only affect a person's behavior, but can also encourage people who continue to do and obtain something (Syafruddin & Sutriawan, 2022). The emergence of possible student interest in learning depends on the teacher in this case the physical education teacher who has self-competence and a high sense of responsibility (Syafruddin et al., 2018). The teacher's ability to cause feelings of pleasure in students towards the learning of the student is expected to be able to cause high interest where students (Syafruddin et al., 2018). Interest in learning can also be influenced by the phases of physical growth and development (Octavia,

2020). In this phase, of course, it is influenced by changes in height and weight, and body mass index (BMI) which can then be done with anthropometric measurements (Amalia et al., 2018; Mulyadi et al., 2013; Pulungan, 2020).

According to Rüst et al (2013) that measurements of anthropometric characteristics can be made such as weight, height, and body mass index (BMI). Generate BMI often used by a person in determining nutritional status and human body structure (Nuttall, 2015; Rahmadi, 2014; Sudibjo et al., 2015; Sutiari, 2017; Wilujeng, 2019). Anthropometry and physical activity that are interrelated and have an important role in sports science affect human growth and development (Džakula et al., 2020; Towlson et al., 2018). On research Burhaein (2017) Proper and appropriate physical activity is expected to have an impact on physical growth and optimal emotional development. Physical activity for schoolchildren includes play, sports, recreation or sightseeing, education, sports and regular exercise (Opstoel et al., 2015). Broadly speaking, physical activity in schools is recommended in order to improve cardiorespiratory fitness and muscle strength, bone health, cardiovascular health and metabolism (Yang, 2019). In direct school, students certainly get this physical activity in the learning of the physical examiner. Apart from that, of course, students of Islamic elementary school are at their growth and development rate in the category of growing up in adolescence (Hasanah, 2021). In this growth, MI students are very easily influenced by negative things. The most effective effort is to direct them to fill their free time with positive activities, one of which is sports activities. In sports, you will get positive values, one of which is growing and developing an interest in learning physical education (Irmansyah et al., 2020). For this reason, this research is needed to find out the effect of anthropometry and physical activity on students' learning interest in elementary school.

METHODS

Research Design and Procedures

This study used a quantitative descriptive research design with a cross-sectional survey approach, measuring time and obtaining questionnaire answers from the dependent and independent variables in the research subjects measured at the same time (Sugiyono, 2017). This study used two anthropometric independent variables (X1) and physical activity (X2) and one dependent variable learning interest (Y).

Participants

This research was conducted at Madrasah Ibtidaiyah (MI) Baabussalaam and Madrasah Ibtidaiyah (MI) Raden Intan which are located in Gading Rejo District, Pringsewu Regency with a total of 137 students in grades IV, V, and VI. So that the determination of a limited population is based on purposive sampling of the entire population as the research sample (Sugiyono, 2017). This study was limited to children with an average age of 10.43 ± 0.9 years.

Instrument

Research instruments for anthropometry with Body Massa Index (BMI) measurements calculate height and weight (Hermawan et al., 2021; Kemenkes RI, 2017; Pradhan et al., 2017). International Physical Activity Questionnaire-Children (PAQ-C) (Kowalski et al., 2004) was adopted and adapted in Indonesian version (Erwinanto, 2017). An Indonesian version of PAQ-C showed fair enough reliability and validity score. Learning

interest questionnaire was adopted from research by Nopiyanto et al. (2021) with five scale format.

Data analysis

This study uses quantitative descriptive data analysis techniques. Data analysis starts from the beginning to the end of data collection in the form of numbers obtained from the results of measurement calculations and questionnaires which are carried out by presenting them in a structured form so that they are easy to understand. then data analysis was continued with testing between variables using multiple linear regression based on Product Moment to determine the effect between these variables with the help of management of IBM SPSS version 25.

RESULTS AND DISCUSSION

Anthropometric Measurements

Anthropometry can be done with BMI as indicator of body condition whether it is classified as ideal, underweight, or overweight through protection (BB/TB in the form of kg/m²) (Hermawan et al., 2021; Heymsfield et al., 2016; Nuttall, 2015; Sutiari, 2017). Body mass index can estimate body mass, including fat. With a person's BMI known, a person's health condition related to the health risks of their body can be predicted (Contreras-Osorio et al., 2022; Heymsfield et al., 2016; Nuttall, 2015). Table 1 showed that average age: 10.83 ± 0.8 years with $p < 0.05$, height: 139.06 ± 2.3 cm with $p < 0.05$, weight: 31.38 ± 3.98 kg with $p < 0.05$, and BMI: 16.2 ± 2.07 with $p < 0.05$.

Table 1. Profile of students' antropometric

Antropometry	Total sampling	Group	
		Male (n=62)	Female (n=75)
Age	137 (10.83 ± 0.8)	10.78 ± 0.71	10.88 ± 0.91
Height	137 (139.06 ± 2.3)	140.11 ± 2.35	139.265 ± 2.6
Weight	137 (31.38 ± 3.98)	31.065 ± 3.75	30.96 ± 3.75
BMI	137 (16.2 ± 2.07)	15.945 ± 1.85	16.145 ± 2.05

Physical Activity

Physical Activity data was assessed using PAQ-C in a structured manner and calculated on average with subjects applying at the age of 10-12 years, who are in an educational institution, such as schools that have rest periods, school schedules with PAQ-C activity score assessments on questions 9 items (Kowalski, 2014). Physical activity results were showed in Table 2. The result confirmed that eight item scores showed

significant effect on based on sex ($p < 0.05$), except for the ninth item (Week Summary) where $p > 0.05$ which means insignificant. Then the contribution of influence on eigenvalues greater than 1 was reported for three factors, which accounted for 57.6% of the variance. Factor three consists of item One (Checklist), one (physical education), and item three (PA at rest), as well as all other items classified as factor one.

Table 2. Distribution of physical activity with PAQ-C

		Boys (n = 62)	Girls (n = 75)	All (N = 137) Mean (SD)	Eigenvalues	Extraction SUM	P- value
Checklist	Q1	1.71 (0.65)	1.53 (0.52)	1.62 (0.59)**	30.504	2.745	0.000
PE Class	Q2	3.33 (1.04)	3.25 (1.27)	3.29 (1.16)**	44.759	1.283	0.000
Recess	Q3	1.61 (0.85)	1.30 (0.64)	1.45 (0.76)**	57.692	1.164	0.000
Lunch	Q4	2.48 (1.05)	2.47 (1.29)	2.48 (1.18)**	68.176		0.000
After school	Q5	1.70 (0.91)	1.64 (0.93)	1.67 (0.91)**	77.125		0.000
Evenings	Q6	2.55 (0.88)	2.73 (1.20)	2.64 (1.06)**	84.418		0.000
Weekend	Q7	2.44 (0.93)	2.38 (0.85)	2.41 (0.88)**	90.764		0.000
Description	Q8	1.74 (0.93)	1.60 (0.66)	1.67 (0.80)**	96.762		0.005
Week Summary	Q9	1.94 (0.74)	1.98 (0.74)	1.96 (0.74)**	100.000		0.070
PAQ-C	Total	19.50 (3.80)	18.90 (4.68)	19.18 (4.27)			

Learning Interest

Student interest in learning is the main factor that determines the degree of student learning activities (Nopiyanto et al., 2021). The results of

the classical Interest in Learning calculation are grouped into five categories based on research (Nopiyanto et al., 2021; Sudijono, 2012), as follows:

Table 3. Frequency distribution of learning Interest

No	Interval	Category	Frequency	Percentage
1	86-100	Very High	0	0.00%
2	70-85	High	13	1.69%
3	60-69	medium	54	29.16%
4	50-59	Low	57	32.49%
5	0-49	Very low	13	1.69%
Sum			137	100 %

Table 4 shows that the profile of students' learning interest are very low 1.69% (13 students), the low category is 32.49% (57 students), the medium category is 29.16% (54 students), the high category is 1.69% (13 students), and the very high category is 0.00% (0 students). Based on the average score, students' learning interest is in the "low" category. The test of the normality of the variable was carried out using the Kolmogorov-Smirnov

formula. the Unstandardized Residual value with One-Sample Kolmogorov-Smirnov showed that the data set used in this study follows a normal distribution ($p > 0.05$). Linearity testing was carried out by the F-test. This procedure was applied to determine the relationship between anthropometry and physical activity toward learning interest. The result confirmed linear relationship between variables which indicated the suitability data for multilinear regression analysis.

Table 4. t-test results

Variable hypothesis	t_{count}	t_{table}	P value	Information
Anthropometry * learning interest	-1.208	2.720	.229	Not significant
Physical activity * learning interest	11.947	2.720	.000	Significant
Anthropometry * physical activity	6.562	2.720	.000	Significant
Anthropometry and physical activity * learning interest	74.265	2.720	.000 ^b	Significant

Based on the results of data analysis, it is known that one of the hypothesis tests on anthropometric variables has no effect on the variable of learning interest of school students and testing of physical activity variables affects student learning interest in school. However, in joint testing, anthropometry and physical activity affect students' interest in learning at school. The test results can be observed in Table 4. The effect of the anthropometry toward learning interest known to be not significant with $\text{sig.} > 0.05$ and $t_{\text{count}} < 2.720$. Therefore, it can be concluded that which means that there is no influence between the variable. This is confirmed in research Schou et al (2015) that anthropometry (BMI) directly does not affect the interest in learning, but indirectly there is a contribution to students because changes in body shape result in decreased performance in learning at school. It is also conveyed Asmara & Yasin (2020) in his research said that there was a significant relationship between anthropometry and interest in learning based on nutritional status, due to the

importance of anthropometry (BMI) to foster high interest in learning based on quality food intake.

The effect of the variable physical activity towards students' interest in learning at school, known to be significant with $\text{sig.} < 0.05$ and $t_{\text{count}} > 2.720$. This is reinforced in research Chen et al (2014) this study showed that students' active exploration and belief in the success of physical education classes had a limited effect on their participation in physical movement. Individual feelings relating to choice in initiating and regulating students' actions in physical education in primary school predicting their physical with determination of fate and achievement goals long-term improvement of physical activity levels in school (Yli-piipari et al., 2013; Yli-Piipari et al., 2012). Moreover, anthropometry effect on physical activity known to be significant with $\text{sig.} < 0.05$ and $t_{\text{count}} > 2.720$. The effect of the anthropometry and physical activity together toward students' learning interests, known to be significant with $\text{sig.} < 0.05$ and $t_{\text{count}} > 2.720$. Research by Legey et al (2016) clarified that learning interest seems to

be influenced by anthropometric measurements of body size and distribution of body fat. This dissatisfaction can negatively affect quality of life and mood in children affected by physical activity. In this study, the relationship between physical activity and interest in learning in upper class of elementary students was at a significant level with a strong and high level of interpretation. Therefore, anthropometric factors and physical activity affect students' interest in learning physical education, sports and health. Students in physical education classes have high average grades, and most students are motivated by interest-based factors such as intrinsic value and gross interest, two similar components of expected amount approach and interest theory (Chen et al., 2012, 2014). These findings illustrate that early childhood in primary school tends to be intuitive learners who are interested in and fascinated by the exciting effects of fun in learning activities or experiences because primary schoolers have less

knowledge about health and physical activity (Chen et al., 2012). Therefore, some indicators that can be suggested as factors that are not studied can also affect students' interest in learning physical education such as teacher teaching methods, environment, food nutrition, teacher education, facilities and infrastructure in schools, extracurricular activities and others.

Moreover, based on the linear regression results, anthropometry and physical activity contributed to students' learning interest by 52.60% which interpreted as moderate category. The remaining 47.30% is impacted by factors which not discussed in this study, such as lifestyle, environmental elements, nutrition components, and others. The magnitude of the r Product Moment confirmed the positive correlation between anthropometry and physical activity toward learning interest with $r_{\text{count}} = 0.725$, which indicated the strong and high relationship.

Table 5. Multiple linear regression result

Model Summary ^b									
Model	R	R Square	Adjusted R Square	SE	Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.725 ^a	.526	.519	4.078	.526	74.265	2	134	.000

CONCLUSIONS

The current study concluded the significant effect of anthropometry and physical activity toward sport learning interest of elementary school students. Moreover, a strong relationship of all factors are also confirmed. Physical education is needed especially for children to increase their physical activity so that anthropometric parameters can be changed. Improve multiple determinants of healthy breathing, including self-efficacy, knowledge of healthy living, and young student self-reports of effective breathing action. These positive effects, coupled with recognized effectiveness and positive support from teachers,

improve knowledge about healthy living in primary school. This study is an initial reference in identifying the influence of the variables studied because in the age range of 8-14 years, children who are still in the process of determining interest in learning. Hopefully in the future research can be carried out continue with more and wider samples, until then it can find out changes in each phase of growth.

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