Breakfast habits, physical activities, and overweight in elementary school children

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ABSTRAK

Latar belakang: Kegemukan terjadi akibat dari asupan energi yang lebih tinggi dibandingkan dengan pengeluaran energi. Faktor-faktor yang dapat menyebabkan kegemukan sering diabaikan oleh masyarakat seperti kebiasaan sarapan yang kurang baik dan rendahnya aktivitas fisik yang dilakukan oleh anak sekolah dasar.

Tujuan: Tujuan penelitian ini untuk mengetahui hubungan antara kebiasaan konsumsi sarapan dan aktivitas fisik dengan kejadian kegemukan pada anak sekolah dasar.

Metode: Penelitian ini merupakan penelitian observasional dengan rancangan cross sectional dengan 130 subjek dan menggunakan uji chi square pada tingkat kemaknaan 95% (α=0,05).Pengambian data kebiasaan sarapan menggunakan kuesioner ang sudah divalidasi, pengambilan data aktivitas fisik menggunakan kuesioner PAQ-C (Physical Activity Questionaire for Children) dan data status gizi diambil dengan melakukan penimbangan serta pengukuran tinggi badan kemudian diklasifikasikan menggunakan indikator IMT/U.

Hasil: Hasil analisis menggunakan uji chi square menunjukkan terdapat hubungan antara kebiasaan konsumsi sarapan dengan kegemukan pada subjek (p=0,009) dan terdapat hubungan antara aktivitas fisik dengan kegemukan pada subjek (p=0,000).

Kesimpulan: Kesimpulan penelitian ini adalah terdapat hubungan yang bermakna antara kebiasaan konsumsi sarapan dan aktivitas fisik dengan kegemukan pada anak usia sekolah dasar.

KATA KUNCI: *aktivitas fisik, kebiasaan sarapan, kegemukan*

ABSTRACT

Background: Overweight occurs as a result of higher energy intake compared to energy expenditure. Many people often underestimate about factors that can lead to overweight, such as bad breakfast habits and low physical activity in elementary school children.

Objectives: The purpose of this study is to determine a correlation between breakfast habits and physical activity of students in elementary school with overweight.

Methods: This study was an observational study with a cross-sectional design with 130 of the students and tests of the significance level of 95% (α=0.05). Breakfast habits data obtained using a validated questionnaire, physical activity data collection using the PAQ-C (Physical Activity Questionnaire for Children) and nutritional status data were taken by weighing and measuring height then classified using BMI-for-age indicators.

Results: The result of the analysis using a chi-square test showed that there was a correlation between breakfast habits and overweight (p=0.009) and there was a correlation between physical activity with overweight (p=0.000).

Conclusions: The conclusion, there are correlations between breakfast habits and physical activity with overweight among primary school children.

KEYWORDS: *physical activity, breakfast habits, overweight*

INTRODUCTION

Health problems occur in this modern era. Changes in lifestyle and socioeconomic patterns of society are the main things behind the background of various diseases, especially nutrition-related problems such as for overweight. Overweight can occur in all ages, does not close the possibility also in elementary school children (1). The global prevalence of primary school children who are overweight and obese has increased until the last two decades, estimated to reach 60 million by 2020 (2). Based on the Riskesdas (Basic Health Research) results between 2010 and 2013 there was an increase in the overweight rate of primary school children in Indonesia by 9 percent (3,4). Based on the 2010 Riskesdas (Indonesian Basic Health Research) data (3), information was also obtained that the prevalence of overweight in primary school-aged children in West Java was 8.5 percent (5). The highest rate of obesity occurs in elementary school children who live in urban areas which are equal to 10.4 percent. This is due to the economic progress in urban areas which has an impact on the changing diet patterns of urban people who tend to be wrong (6).

Changes in the diet for each individual will affect their eating habits. The same thing happened with breakfast habits. Breakfast habits become one of the factors causing obesity in children (7). According to the data of Kemenkes Republic of Indonesian in a balanced nutrition guidebook, breakfast is a food and drink activity carried out between waking up until 9 am intended to fulfill a portion of daily nutritional needs (15-30% of nutritional needs) in order to realize a healthy, active and productive life. Many Indonesians still do not get used to breakfast. School-age children who do not do breakfast tend not to concentrate on learning. According to balanced nutrition guidelines, a good breakfast is a breakfast whose food consists of carbohydrate food, side dishes, vegetables or fruits and water (8).

Besides the breakfast factor, one of the factors causing overweight in elementary school children is the low level of physical activity. According to a study in 2016 (8), physical activity has a significant correlation with the incidence of overweight in children. Children who are doing moderate-heavy physical activity ≤1 hour per day have 5 times the chance to experience more nutritional status, in this case, overweight than children with moderate activity >1 hour per day.

MATERIALS AND METHODS

This study has passed the ethical elligibility by health research ethics committees University of Muhammadiyah Prof. DR. HAMKA NO. 003/18.01/004. This study was conducted in April-June 2018 XIX Elementary School Kayuringin Jaya, Bekasi. The population in this study was all 4-6 grade elementary school students aged 10-12 years in Kayuringin Jaya XIX Elementary School, Bekasi City with 130 subjects. Estimates of the subjects used the estimated proportion formula. The selection of subjects using a purposive sampling method with inclusion and exclusion criteria that have been determined. Inclusion criteria: 1. Aged 10-12 years, 2. Being in grade 4-6 elementary school, 3. Willing to participate in research; Exclusion criteria: 1. Students 4th-grade-6 elementary schools with age 10-12 years who were absent during the study, 2. Grade 4-6 elementary school students with underweight and very thin nutritional status (BMI/U-2 elementary school). The variables in this study are independent variables (breakfast habits and physical activity) and the dependent variable (overweight). The operational definition of breakfast habits is the activity of eating and drinking, which is done starting from waking up until 9 in the morning in order to meet 15-30% of daily nutritional needs, where the type of food consumed is complete (carbohydrate, vegetable and animal protein, vegetables or fruit and water), while for physical activity is an activity in which a person engages in activities involving physical movements of the body and is carried out periodically from time to time. The instrument used was a modified questionnaire, which is a questionnaire related to breakfast habits and PAQ-C. The method of assessment the breakfast habit questionnaire is summarizing the total overall

score and calculate an average score if the total score less than or equal to the average score that scores is classified into poor breakfast habits categories and if the total score more than to the average score that is classified into well breakfast habits categories (9). The method of assessment was also used for the PAQ-C questionnaire. The statistical test in this study used the *chi-square* test.

RESULTS

Subject Characteristics

Table 1 shows the characteristics of the subjects.

Table 1. Characteristics of subjects

Variable	n	Mean	SD	Min.	Max
Age (years)	130	11.3	0.8	10	12.9
Weight (kg)	130	39.1	11.0	22.5	70.8
Height (cm)	130	138.8	8.3	116	156
Z- *score* (BMI-for-age)	130	1.1	1.9	-1.9	5.45

Table 1 shows the mean age in the subject, which is 11.3±0.8 years, range from 10 to 12.9 years. The average body weight is 39.1±11.0 kg, between 22.5 to 70.8 kg. An average height of 138.8±8.3 cm, ranging from 116 to 156 cm. The average z-score is 1.1±1.9 SD, ranging from -1.9 to 5.45. **Table 2** shows the characteristics of the subjects based on gender, grade, and age.

Table 2 shows the total of subjects based on gender, grade, and age. The number of male and female subjects is as many as 65 children each.

Table 2. Characteristics of subjects based on gender, grade, and age

Variable	(n=130)	%
Gender		
Male	65	50.0
Female	65	50.0
Class		
4	36	27.7
5	45	34.6
6	49	37.7
Age		
10 years	50	38.5
11 years old	48	36.9
12 years old	32	24.6

The highest number of subjects based on grade is in grade 6, which is 37.7 percent. The highest number of subjects based on age is at the age of 10 years (38.5%)

Nutritional Status of Children

From the results of the study, it was found that the percentage of overweight in schoolchildren at Kayuringin Jaya XIX Elementary School in Bekasi was 42.3 percent, while the percentage of normal nutritional status was 57.7 percent.

Table 3. Distribution of subjects based on nutritional status

BMI-for-age Nutritional Status	(n=130)	%
Overweight	55	42.3
Normal	75	57.7

Breakfast Habits

Based on the data below, most of the subjects had well breakfast habits is 55.4 percent. Based on the results of the questionnaire, the subject stated that they always did breakfast (5-7x/week). This is evidenced from the results of the answers of the subjects who stated that they always had breakfast as much as 63.8 percent, but there were still subjects who rarely did breakfast that is as much as 14.6 percent and 21.6 percent of the subjects said they did not do breakfast.

Table 4. Distribution of subjects based on breakfast habits

Breakfast Habits	(n=130)	%
Poor	58	44.6
Well	72	55.4

Physical Activity

Based on the data below, most of the subjects had a low level of physical activity which was 50.8 percent. Based on the results of the questionnaire, many subjects stated that only doing physical activity during sports lesson hours (Tuesday) only. Based on the results of the questionnaire, physical activity on weekdays (Monday, Wednesday, Thursday and Friday) is only done 1-2 times per week. Types of physical activity carried out by subjects such as *galaksin*, walking, badminton, playing roller

skates, playing kites, patekong, volleyball, cycling, running/jogging, gymnastics, swimming, playing *polisi maling*, *teprak gunung*, *petak jongkok*, hide and seek, playing *benteng*, basketball, *pencak silat* and skipping. Of the types of physical activity, the activities most often carried out by subjects are *galaksin* playing, walking, badminton, playing roller skates, and playing kites.

Table 5. Distribution of subjects based on physical activity

Physical Activity	(n = 130)	%
Poor	66	50.8
Well	64	49.2

Correlation between Breakfast Habits and Overweight

Based on **Table 6**, it can be seen that subjects who have poor breakfast habits that normal and overweight respectively that are 43.1 percent and 56.9 percent, while subjects who have well breakfast habits have normal and overweight respectively that is 69.4 percent and 30.6 percent. Subjects who had a higher breakfast habit had a percentage of overweight than normal. It can be said that there is a tendency for subjects with poor breakfast habits have overweight while subjects with good breakfast habits tend to have normal. The correlation between breakfast habits with an overweight subject can be seen from the p-value of 0.009, meaning that there is a statistical correlation between the consumption habits of breakfast with overweight in elementary school children.

Correlation between Physical Activity and Overweight

Based **on Table 7** it can be seen that subjects who have poor physical activity have normal and overweight respectively that are 45.5 percent and 54.5 percent, while subjects who have well physical activity have normal and overweight respectively 70.3 percent and 29.7 percent. Subjects who had poor physical activity had overweight nutritional more than normal. It can be said that there is a tendency for subjects with poor physical activity to have overweight while subjects with well physical activity tend to have normal nutritional status. The correlation between physical activity and overweight in the subject can be seen from the p-value of 0.000, meaning that there is a statistical correlation between physical activity and overweight in elementary school children.

DISCUSSION
Correlation between Habits of Breakfast and Overweight

The results of the study were obtained from 130 subjects, as many as 56.9 percent of subjects who had poor breakfast habits had overweight. Some studies on similar elementary school children also mentioned that subjects who had poor breakfast habits had overweight nutritional status. A similar study stated that in elementary school children in Jakarta who had poor breakfast habits had normal and overweight nutritional status respectively 33.3 percent and 66.7 percent (10). The research in 2017 states that in elementary school children in

Table 6. Correlation between breakfast habits and overweight

Breakfast Habits	Child Nutritional Status						p-value
	Normal		Overweight		Total		
	n	%	n	%	n	%	
Poor	25	43.1	33	56.9	58	100.0	0.009
Well	50	69.4	22	30.6	72	100.0	

Table 7. Correlation between physical activity and overweight

Physical Activity	Child Nutritional Status						p-value
	Normal		Overweight		Total		
	n	%	n	%	n	%	
Poor	30	45.5	36	54.5	66	100.0	0.000
Well	45	70.3	19	29.7	64	100.0	

Semarang who have poor breakfast habits had not overweight nutritional status and overweight, respectively 37.5 percent and 62.5 percent (11).

The results showed that there was a correlation between breakfast habits with overweight. This is evidenced by the results of the chi-square test with a p-value of 0.009 which indicates that there is a significant correlation between breakfast habits with overweight. This is in line with the research in 2018 that there is a correlation between breakfast with overweight status and students who do breakfast non-routinely (<4x /week). Students who do breakfast non-routinely have an opportunity of 6.116 times overweight compared to students who do breakfast regularly (12).

The habit of skipping breakfast will cause blood glucose levels to decrease. This decreased blood glucose level will cause the body to send impulses to the brain system so that hunger can emerge. This stimulation will cause the desire to eat in large quantities so that they can consume large amounts of food during the day and night. Excessive intake can increase insulin secretion and can inhibit the lipase enzyme. This lipase enzyme itself can function as an overweight breaker into overweight acids and glycerol, if overweight buildup occurs, overweight will be difficult to meet with this enzyme and will not do the process of breaking down the overweight. If this happens continuously it can cause an increase in body weight (13).

Correlation between Physical Activity and Overweight

The results of the study obtained from 130 subjects, 54.5 percent of subjects who had poor physical activity had an overweight status. Some studies on similar elementary school children also mentioned that subjects who had poor physical activity had an overweight status. A similar study in 2016 stated that in elementary school children who have poor physical activity with not overweight status and overweight respectively 23.7 percent and 76.3 percent (14). A similar study found that in elementary school children who had poor physical activity had malnutrition and overweight consecutively were 18.8 percent and 81.3 percent. (15).

The results showed that there was a correlation between physical activity and overweight. This is evidenced by the results of the chi-square test with a p-value of 0.000 which indicates that there is a significant correlation between physical activity and overweight. The results of the study also stated that there were subjects who did physical activity less than 5 times per week, which was as much as 38 percent as evidenced by the results of the questionnaire answers regarding the frequent physical activity. This is in line with the research in 2013, that there is a correlation between physical activity and overweight in elementary school children (16). in 2015 there was research stated that subjects who did not routinely physical activity were likely to be obese 1.35 times compared to subjects who routinely did physical activity (17). A similar study was also conducted in Surabaya (2018), stating that there was a correlation between physical activity and overweight status. This is because a high level of physical activity is likely to increase weight loss (18).

Overweight can occur as a long-term result of excess energy intake from food and drinks, while the energy released is not balanced. This is a result of a lifestyle that lacks activity. Lack of physical activity will cause unused energy to be stored as overweight in adipose tissue. Sedentary behavior is one of the main risk factors for overweight. Today, everything is facilitated by the help of increasingly sophisticated technology. This is what causes humans to rarely do physical activity (19).

CONCLUSION

The average age of the subject was 11.3 ± 0.8 years, the sex of the subjects in this study consisted of 50 percent of male subjects and 50 percent of female subjects. The average body weight of subjects was 39.1 ± 11.0 kg. The mean height of the subjects was 138.8±8.3 cm. The average BMI-for-age z-score of subjects was 1.1 ± 1.9 SD or included in the normal category. Subjects with overweight and normal nutritional status (BMI-for-age) were 42.3 and 57.7 percent respectively. There is a significant correlation between breakfast habits and physical activity with overweight (p=0.009)

and there is a correlation between physical activity and overweight (p=0.000). Suggestions for this study are the need for further research with a wider population and adding variable quality of breakfast and energy intake, so that it can provide an overview of overweight in an area and measure the quality of elementary school children's breakfast and for schools to provide education to students related to the importance of breakfast, this counseling can be done during a UKS program that can work with the local Health Office or Primary Health Center (Puskesmas).

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