

## Original Article

## Obesity among children aged 10-13 years in public and private elementary schools

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### ABSTRACT

**Background** In the last few years, the prevalence of obesity among Indonesian children has been beginning to increase slowly, but studies and publications about obesity are limited. In accordance with the improvement of social economic and child health, obesity can be seen more frequently as a problem in children.

**Objective** To evaluate and compare the prevalence and related factors of obesity among children 10-13 year-old who were students of two kinds of school, namely public and private elementary school.

**Methods** A cross sectional study was done from October until December 1995 on 276 elementary school students aged 10-13 years consisting of 138 public and 138 private elementary school students. Data were collected by a questionnaire including anamnesis of family history and type of daily diet, physical examination, and anthropometric measurement.

**Results** The prevalence of obesity among children in the public and private elementary schools was 9% and 20% respectively, which showed a significant difference ( $p < 0.01$ ). The prevalence of obesity among children was significantly related to parents' welfare, excessive daily calorie intake, level of physical activity, and obesity problem in the family.

**Conclusion** The prevalence of obesity in students of private and public elementary schools was 20% and 9% respectively. Social economic level, calorie intake, sport activities, and obesity problems in the family are factors related to the prevalence of child obesity [Paediatr Indones 2003;43:38-41].

**Keywords:** obesity, prevalence, public school, private school

In the last few years, an increase of the prevalence of overweight children has been reported, especially in the cities. However, our society's knowledge about obesity is very poor indeed. This problem occurs more frequently in the new improvement of social lifestyle and the development of economy and it is more likely to become a nutritional

problem in the society.<sup>1</sup> The prevalence of obesity among Indonesian children can not be established yet. A study on teenagers aged 12-18 years in 1988 showed an increase of obesity prevalence from 6.2% at the age of 12-13 years to 11.4% at the age of 17-18 years. The prevalence of obesity among female teenagers was higher than males (10.2% vs. 3.2%).<sup>1</sup> Obesity can be caused by continuing interaction of multifactor, such as excessive energy intake, low energy expenditure, psychological disorders, genetic problems, and other diseases.<sup>2,3</sup> Complications of obesity that have been found are psychological disorders, respiratory complication, and orthopedic problems. Moreover, if the problem continues until adulthood it can be a risk for getting degenerative metabolic disease, hyperlipoproteinemia, hypercholesterolemia, diabetes mellitus, hypertension, and cardiovascular disease, thus increasing the mortality rate.<sup>1-10</sup>

Students from school with high fees and complete equipments usually come from families with good economic status, and therefore are more prone to develop obesity. A decrease of the level of obesity re-

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lates directly with decreased prevalence of obesity.<sup>9</sup> That is why a study is needed to know what factors and how they are related to obesity. The aim of this study was to assess the prevalence of obesity in children aged 10-13 years in two kinds of elementary school (public and private).

## Methods

A cross sectional study was done on 276 children (138 from private and 138 from public elementary schools) from October 1995 until December 1995. They were 10-13 year-old from the 5<sup>th</sup> and 6<sup>th</sup> grade who were clinically healthy.

Data were collected by means of questionnaire, physical examination, and anthropometrical measurement. The questionnaire consisted of identity of the children and their parents, child's daily diet, and extracurricular activities in the last week. Classification of the nutritional status was based on criteria recommended by Semiloka Antropometri 1991. Based on the classification of WHO-1990, parents with income of more than Rp 65,000/capita/months or \$ 370 /capita/year was defined as having good socioeconomic status.<sup>11</sup>

According to the Recommended Dietary Allowances for Indonesian in 1988, the mean daily calorie

intake is 1950 kcal for male and 1750 kcal for female. Daily calorie intake of more than what is recommended was stated as over nutrition. In relation to nutritional status of the parents, obesity was stated if either father or mother was reported as obese. Body weight was measured using Beam balance Detectomedic with accuracy up to 0.1 kg, while height was assessed by a microtoise with accuracy up to 0.1 cm.

Data were compiled in distribution tables and cross tables. The correlation between qualitative variables was assessed using Chi Square Test and considered as significant if  $p < 0.05$ .

## Results

The characteristics of 276 elementary school children are illustrated in **Table 1**. There was a significant difference in the prevalence of obesity between students of public elementary school (9%) and students of private elementary school (20%) ( $p < 0.01$ ).

Among 39 obese children, 36 had good socioeconomic status and 3 had low socioeconomic status. There was a significant difference ( $\chi^2 = p < 0.01$ ).

Out of total of 46 students with over intake of

**TABLE 1.** CHARACTERISTICS OF THE SUBJECTS

Variable	Public ES		Private ES	
Population	138		138	
Age (month) $\pm$ SD	137 $\pm$ 7.2		133 $\pm$ 7.8	
Gender :	n	%	n	%
Male	65	47	68	48
Female	73	53	70	51
Anthropometric				
Body weight (kg) $\pm$ SD	34.7 $\pm$ 6,6		37.9 $\pm$ 7.1	
Body length (cm) $\pm$ SD	123.9 $\pm$ 6.9		138.2 $\pm$ 7.7	
Energy intake/day (kcal) :				
Male	1850 $\pm$ 23		1970 $\pm$ 46	
Female	1670 $\pm$ 34		1850 $\pm$ 39	
Nutritional status	n	%	n	%
Obesity	12	9	27	20
Overweight	14	10	33	24
Good	33	24	41	30
Moderate	59	43	34	25
Low	20	14	3	1
Bad	0	0	0	0
Social economic	n	%	n	%
Good	28	20	138	100
Low	110	80	0	0

energy, 35 (76%) had obesity, while among 230 students with normal intake, only 4 (2%) suffered from obesity. There was a significant difference  $p < 0.01$ .

Among students suffering from obesity, the proportions of those with mild, moderate, and high sport activity were 28%, 5%, and 18% respectively, while among the non obese students, they were 72%, 95%, and 82% respectively. The difference was statistically significant.

Among 29 students with history of parental obesity, there were 10 who suffered from obesity, while of 247 students without history of parental obesity, only 20 (8%) suffered from obesity. The difference was statistically significant.

## Discussion

The prevalence of obesity in children from private elementary schools was different from that of public elementary schools, which was related with the level of economic status and calorie intake.

According to Wiramihardja (1992), high economic level can automatically increase the purchasing power especially for food, but without the appropriate nutritional knowledge it can cause nutritional problems such as obesity.<sup>13</sup>

In this study, the quality and intensity of sport activity was not evaluated. We only evaluated the quantity of sport activity. It was found that most of them did light sport activity.

In this study, we found significant association between the prevalence of child obesity and the history of parental obesity. It was found that if both parents had an overweight problem, the prevalence of obesity in the children increased by two folds compared to that when only one of the parents had obesity problem. It may be due to the habit of eating or genetic factor.<sup>2</sup>

Emotional disorder is one of the main causes of child obesity. Children with psychological problem usually isolate themselves from their environment that can initiate the sense of excessive hunger, as a compensation of their problems, which furthermore can cause obesity. Unfortunately, in this present study, we did not evaluate psychological factors.

Activity has been proven to be a major factor in energy balance. Other studies had shown that physical activity may influence food intake. Food intake

and body weight tend to be higher in persons with sedentary life style than in those with moderate degree of activity. Such studies suggested that activity could be a significant factor in the etiology of obesity in some children and adolescents.<sup>9</sup> In this present study, we also found a significant association between either calorie intake or sport activities and the occurrence of obesity.

As a conclusion, the prevalence of obesity in the private and public elementary school students was 20% and 9%, respectively. Social economic level, calorie intake, sport activities, and obesity problems in the family are factors related to the prevalence of childhood obesity. Further study using more variables is needed.

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