

## Fast Food Consumption and Obesity: Relationship Among Elementary School Students in Yogyakarta

Djauhar Ismail, ES Herini, Pudjo Hagung, Tonny Sadjimin

(Department Child Health, Medical School, Gadjah Mada University, Yogyakarta)

**ABSTRACT** Excessive consumption of calories particularly those of fast foods in comparison to energy expenditure is considered to be an important cause of obesity in children both in developed and developing countries. The objective of this study was to measure the association between the pattern of consuming fast food and the incidence of obesity in elementary school students in an urban developing country setting. A cross sectional study was conducted to students from 30 elementary schools in Yogyakarta, Indonesia, who were selected by a population proportional multistage cluster random sampling. From the sample of 3575 parents, 3258 returned self fulfilled questionnaires, a response rate of 91.1%. There was a statistically significant association between obesity and the experience of consuming fast food (odds ratio = 2.82; 95%CI 2.08;3.82), the attitude towards fast food (odds ratio = 1.88; 95%CI 1.31; 2.69) and the frequency of consumption of fast food ( $p < 0.001$ ). [Paediatr Indones 1999; 127-133]

### Introduction

Obesity is a condition in which the nutrition status is above normal, characterized by excessive accumulation of body fat.<sup>1-3</sup> Obesity remains difficult to overcome due to its multifactorial causes, each of which is generally potential and influence one another, therefore it requires an integrated treatment covering all related etiological aspects. Obesity in children is a risk factor for obesity in adults,<sup>1,2,4</sup> as well as for cardiovascular disease, hypertension, diabetes mellitus,<sup>2,5-7</sup> hyperlipidemia, atherosclerosis, respiratory disease, and hypercholesterolemia.<sup>1,2</sup>

Although overweight or obesity in Indonesia is not a major health problem like in some modern industrial countries in America and Europe, it begins to appear in big

cities. This occurs when children consume daily food containing more energy than they need.<sup>6-8</sup> This condition is also supported by the availability of fast food such as hamburger, fried chicken, French fries, hot dog, pizza, ice cream and various kinds of noodles which are considered to have less nutrition.<sup>9-11</sup> Those fast foods are popular among teenagers and easy to find in big cities,<sup>6,11</sup> like in Yogyakarta. The objective of this study was to find out the association between the pattern of fast food consumption and the incidence of obesity in elementary school students in Yogyakarta.

### Methods

This was a cross sectional study applied to elementary school students from first to sixth grade in Yogyakarta municipality, and was conducted from November 1994 to May 1995. The subjects were selected by using proportional multistage cluster random sampling. Based on the estimation the obesity prevalence at aged 7-12 years old of 17% with precision of 10% and  $\alpha = 0.01$ , the required study subjects were 3250 students. They were selected from 120 classes in 30 of 380 elementary schools found in 14 sub-districts in Yogyakarta municipality. The data collected were sex, age, school names, grades, anthropometric measurements (weight and height) and pattern of fast food consumption concerning experience, fondness, and frequency of consuming fast food. The definition of obesity in this study was when measurement of weight for height (W/H) resulted in 120% higher or more than the standard.<sup>12-13</sup>

The kinds of fast food in this study were hamburger, hot dog, fried chicken, French fries, and pizza found in fast food restaurants such as Mc Donald's, Kentucky Fried Chicken, Wendy's, Texas Fried Chicken, and Pizza. The frequency of fast food consumption was classified as follows: frequent, when consuming fast food at least once a week; less frequent, when consuming fast food once a month or in 2 months; and rare, when consuming fast food once in 3 months or more. Those who did not return the questionnaires or were absent on the time of survey were excluded from the study.

The nutritional status of the students was assessed anthropometrically by measuring body weight and height. Each subject was weighed in bare feet by scale standardized in Yogyakarta Metrology Department; the instrument had the scale of 0-100 kg with precision of 0.1 kg. Microtoise with the scale of 0-200 cm and precision of 0.1 cm was used to measure the height. A self-filled questionnaire was used to collect the data of fast food consumption pattern. The questionnaire was first tried out to parents who brought their children for medical treatment at the pediatric clinic of Dr. Sardjito General Hospital Yogyakarta in order to find out whether the questions were understandable, and to select valid and reliable questions. The parents filled in the questionnaires with their children at home, then they submitted it to the teachers who later handed it to the researchers. Nominal data were analyzed by chi-square test with the level of significance of  $p < 0.05$ ; odds ratios with their 95% confidence intervals were supplied.

### Results

Of 3575 questionnaires given to the parents, 3258 were returned (a response rate of 91.1%); 317 questionnaires (8.9%) were excluded because 68 students did not attend the class and 249 did not return the questionnaire. Of the 3258 students available for analysis, 1675 (51.4%) were boys and 1583 (48.6%) were girls. The overall prevalence of obesity was 9.5% (10.5% in boys and 8.5% in girls). See Table 1.

Table 1. Association between obesity and gender (n=3258)

Nutritional status	Male		Female		Total	
	n	%	n	%	n	%
Obese	176	10.5	134	8.5	310	9.5
Non-obese	1499	89.5	1449	90.5	2948	90.5
Total	1675		1583		3258	100.0

$$\chi^2=32.43; df=1; p=0.047$$

When questioned about their experience on fast food consumption, 1825 students (64%) responded that they had the experience, while 1025 students (36%) did not. When associated with the incidence of obesity, it showed a significant difference; i.e., students with the experience of consuming fast food had as high as 2.8 times to be obese than those without experience of fast food consumption (Table 2).

Table 2. Association between obesity and experience of consuming fast food (n=3071)\*

Nutritional status	Ever		Never		Total	
	n	%	n	%	n	%
Obese	249	12.7	63	4.9	303	9.9
Non-obese	1717	87.3	1051	95.1	2768	90.1
Total	1966		1292		3071	100.0

$$OR = 2.82 (95\%CI 2.08;3.82)$$

$$\chi^2=48.832; df=1; p<0.0001$$

\* no. of missing cases=187

Of the 1825 students who had experience in consuming fast food, 1460 (74.3%) reported that they liked fast food, while the remaining 506 children (25.7%) did not. Those who liked fast food had a tendency to have obesity almost twice as much as those who did not (Table 3).

Table 3. Association between obesity and fondness of fast food (n=1966)

Category of Nutrition status	Like		Dislike		Total	
	n	%	n	%	n	%
Obese	198	13.6	39	7.7	237	12.1
Non-obese	1262	86.4	467	92.3	1729	87.9
Total	1460		506		1966	100.0

OR = 1.88 (95% CI = 1.31-2.69)  
 $\chi^2 = 12.147$ ; df = 1; p = 0.00049

The frequency of fast food consumption varied from frequent (at least once a week), less frequent (once a month or in 2 months) and rarely (once in 3 months or more). There was a significant association between the frequency of fast food consumption and the incidence of obesity ( $p < 0.001$ ) (Table 4).

Table 4. Correlation between obesity and the frequency of fast food consumption (n=1953)\*

Nutritional status	Frequent		Less Frequent		Rarely		Total	
	N	%	n	%	N	%	n	%
Obese	41	12.8	109	16.1	87	9.1	237	12.1
Non-obese	280	87.2	568	83.9	868	90.9	1716	87.9
Total	321		677		955		1953	100.0

$\chi^2 = 18.303$ ; df = 2; p < 0.001. \* no of missing cases = 13

## Discussion

The incidence of obesity in children has increased recently due to some factors, among others are the improvement of social economic condition of society<sup>14</sup> which increases

the purchasing power, and large amount of foods available including fast food which contains more protein, fat, sugar, and salt but less fibre.<sup>6,8</sup> Obesity is also influenced by the habit of consuming snacks containing high calorie and carbohydrate. Consuming snacks while watching television may cause less use of energy and high intake of calorie.

The study showed that the obesity prevalence of elementary school students in Yogyakarta was 9.5%, the incidence in boys was 10.5% while in girls 8.5%. This finding was different from other studies which generally found higher obesity prevalence in girls than in boys. A similar study in Jakarta<sup>2</sup> conducted to students aged 6-18 years old showed that the incidence of obesity in boys was 3.1% and in girls was 10.2%. Another similar study in Chili showed that the obesity prevalence in male students was 7.2% and that in female students was 12.9%.<sup>2</sup>

Further studies are required in order to identify the influential factors for obesity, such as hereditary factor, social economic condition of the family, physical activities, the habit of consuming snacks while watching television, the pattern of fast food consumption. Our data indicate that 64% of students were reported to have experience of consuming fast food and this was significantly related to the incidence of obesity (Table 2).

Seventy four percent of students who consumed fast food said that they liked it (Table 3). The preference towards certain kinds of foods will determine the selection of the foods to be consumed. The students who liked fast food had almost twice as much to be obese as those who did not. See Table 3.

One of the causes of obesity is excessive consumption of calorie. The students who consumed fast food showed higher incidence of obesity which was significantly different ( $p < 0.001$ ) than those who rarely consumed it (Table 4). Ho Fong<sup>12</sup> stated that children high frequency of fast food consumption for example several times a week and their habit or attitude towards the kinds of foods will harm their health. Snack foods do not only contribute social economic value to the sellers, but also has nutritional implications to the consumers. Therefore, its role as a nutritional contributor for daily menu becomes necessary.<sup>16</sup>

The negative aspects of the snack foods can be determined from the quality of microbiology, chemicals, and nutritional contents which can harm people's health in the forms of diarrhoea, organ damage, obesity, and other health problems. There are biological, social, and psychological factors that are related to children's habit on snack food consumption. Biologically, the habit is related to their need for nutrition which is important for their growth. Social contact with their friends enable students to have the same habits. Their socialization with friends also make them recognize some kinds of foods they have never known before. They gained social satisfaction when they consume fast food with their friends. Psychologically, the habit above shows the behavioral development of children as they grow. Their character changes as they get

together with their friends, enjoying fast food. Intellectual development may be influenced by this kind of habit, for example having an ability to count, spend money, set up a plan, etc. For those reasons, Based on the facts above, it can be concluded that the students' habit on buying snack food has some educational values.<sup>16</sup>

Parents and teachers are expected to make use of those values in order to teach their children in selecting some snack foods. Intensive promotion through various media and large number of fast food stalls make teenagers like it. In fact, there are many kinds of local foods containing high nutrition which is useful for health. The improvement of processing in order to make the local food hygiene; free from harmful substance and have high contents of community nutrition may support the community nutrition improvement program.<sup>11</sup>

The obesity prevalence of elementary school students in Yogyakarta was 9.5%, the incidence in male students was 10.5% and in female students was 8.5%. Most of the elementary school students in Yogyakarta have had experience of consuming fast food. Their experience, fondness, and frequency of consuming fast food are correlated with the incidence of obesity. Consuming fast food once in 2 months has a higher possibility of obesity than consuming fast food once in 3 months or in a rare frequency.

We conclude a significant association of fast food consumption and obesity. It is necessary to anticipate the incidence of obesity in elementary school students, so that it can be prevented or cured and will not develop in their adult life, since the obesity in adults have more complications and high mortality. Children have to reduce the habit of consuming fast foods especially those containing high calory and fat.

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