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Consumption Pattern and Nutrition Conseling Roles on Obesity of Integrated Primary School Students

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Abstract

The optimal growth of school-age children depends on providing nutrients with good and correct quality and quantity. One of the health efforts is to improve nutrition of elementary school age children. The purpose of this study was to analyze the relationship of consumption patterns and nutrition counseling to the incidence of obesity. The type of research used was observational with a cross sectional study approach. The population and sample of this study were students with exhaustic sampling with 146 samples. This research was conducted at the Rama Integrated Islamic Primary School in Makassar City. The results showed that consumption patterns associated with the incidence of obesity with a value of p (0.00) <0.05, nutritionlcounseling was associated with the incidence of obesity with a value of p (0.01) <0.05. The conclusion is that there is a relationship between consumption patterns and nutritional counseling on the incidence of obesity. For students who have already suffered from obesity in order to maintain regular and strict diet and physical activity and consult a nutritionist.

Abstrak

Tumbuh kembangnya anak usia sekolah yang optimal tergantung pemberian zat gizi dengan kualitas dan kuantitas yang baik dan benar. Salah satu upaya kesehatan tersebut adalah dengan perbaikan gizi anak usia sekolah dasar. Tujuan penelitian ini untuk menganalisis hubungan pola konsumsi dan konseling gizi terhadap kejadian obesitas. Jenis penelitian yang digunakan adalah observasional dengan pendekatan cross sectional study. Populasi dan sampel penelitian ini adalah siswa dengan pengambilan sampel secara exhaustic sampling dengan jumlah 146 sampel. Penelitian ini dilaksanakan di Sekolah Dasar Islam Terpadu Rama Kota Makassar. Hasil penelitian diperoleh bahwa pola konsumsi berhubungan dengan kejadian obesitas dengan nilai p (0,00) < 0,05, konseling gizi berhubungan dengan kejadian obesitas dengan nilai p (0,01) < 0,05. Kesimpulan diperoleh bahwa ada hubungan pola konsumsi dan konseling gizi terhadap kejadian obesitas. Bagi siswa yang sudah terlanjur menderita obesitas agar menjaga pola makan dan aktivitas fisik secara teratur dan ketat serta berkonsultasi ke ahli gizi.

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INTRODUCTION

School-age children are the next generation and development capital. Therefore, the level of health needs to be fostered and improved. One of the health efforts is to improve nutrition of elementary school age children. The optimal growth of school-age children depends on providing nutrients with good and correct quality and quantity (Anto et al. (a), 2017; Anto et al. (b), 2017; Pienaar, 2015).

Currently over nutrition and obesity are epidemics in developed countries, such as Australia, New Zealand, Singapore and rapidly developing in developing countries, especially the population of the Pacific Islands and certain Asian countries. In United State of America (USA), more than 60% of the adult population is overweight and obese, in adolescents 20-25% are obese (Anto et al. (a), 2017; Anto et al. (b), 2017; Vichealth, 2016; Almarzooqi and Nagy, 2011; Caballero et al., 2017; Pienaar, 2015). A survey in South Korea in 1995 reported as much as 1.5% obesity (BMI> 30 kg/m2) and 20.5 overweight (BMI 25-29.9 kg/m2) (Lee & Ham, 2015). Thailand 4% obese, 16% overweight, Malaysia 4.7% male and 7.7% women were obese. In Malaysia the ethnic Indian population of 16.5%, Chinese 4% and Malays 8.6% were obese and urban men were 5.6% compared to rural areas of 1.8%, in urban areas women were 8.8% compared to rural areas 2.6% (Aprilia, 2015; Chang et al., 2014; Häkkänen et al., 2016; Caballero et al., 2017).

The data above shows that in line with development and industrialization followed by lifestyle changes, the prevalence of over nutrition and obesity sufferers is higher and there is a close relationship between high economic growth in urban areas, changes in food consumption patterns with increasing degenerative diseases (Sturm & Rand, 2012). Modern life in a residential environment, progress and various forms of ease (instant) produce a relaxed lifestyle, energy that was used for activities is not needed anymore and will be stored as fat deposits and eventually lead to the incidence of over nutrition (Anto et al. (a), 2017; Pienaar, 2015; Zhao et al., 2017).

Research by Zhao (2017) stated that children consuming fast food will suffer from obesity (Zhao et al., 2017). Increased prevalence of obesity also occurs in developing countries like Indonesia. *Riskesdas* (*Riset Kesehatan Dasar* or Basic Health Research) 2010 showed an increase in obesity in adults aged> 18 years, around 11.7% suffer from obesity (male 7.8%, female 15.5%) and about 2.5% of children aged 13-15 years and 1.4% of adolescents aged 16-18 years are considered obese (Health Research and Development Agency, 2010). The 2013 Basic Health Research (*Riskesdas*) data showed that nationally the prevalence of obesity in adolescents aged 13-15 years in Indonesia was 10.8%, consisting of 8.3% fat and 2.5% very fat (obese).

Obesity can occur because lifestyle and environment in this case are difficult to change because these habits have been going on since childhood. Foods that are often consumed by obese children are usually in the form of potato chips and similar snacks, biscuits, chocolate, soft drinks, fast food (fried chicken), etc (Lee & Ham, 2015; Anita & Simanjuntak, 2018). These foods and drinks are calorie-dense, low in nutrients (vitamins and minerals) so they can cause obesity when consumed in excess (Almarzooqi & Nagy, 2011; Caballero et al., 2017; Halberstadt et al., 2017).

In general, the effects caused by obesity, namely disorders of physical growth, respiratory problems, endocrine disorders, psychosocial disorders that result in inferiority, depression and away from association and suffer from degenerative diseases later on. A preliminary survey conducted in the month at the Rama Integrated Islamic Elementary School in Makassar City, involving 156 students, weighed and measured in height was known as the prevalence of overweight male students as much as 20.73% and female students as much as 19.0%, for prevalence obesity male students as much as 25.65% and female students 19.5%. The purpose of this study was to analyze the relationship of consumption patterns and nutritional counseling to the incidence of obesity in students of the Rama Integrated Islamic Primary School in Makassar City.

METHODS

This was observational study with a cross sectional approach to analyze the relationship between consumption patterns and nutritional counseling on the incidence of obesity in Rama Integrated Islamic Primary School students observed in the same time period. The research was conducted at the Rama Integrated Islamic Primary School in Makassar City and was conducted in May. The population and sample in this study were all students in grades 1 to 6 of the Rama Integrated Islamic Primary School in Makassar City who were registered and active in 2009 as many as 146 people, and sampling was performed using exhaustic sampling techniques. Data collected were consumption patterns and nutritional counseling conducted through direct interviews using questionnaires, food frequency questionnaire, prepared 2x24 hour recall food method, anthropometric data including body weight and height (weight was measured using tread scales with capacity 150 kg with a precision level of 0.1 kg) (Haregu et al., 2016). while height was measured using microtoise with capacity of 200 cm with a precision

level of 0.1 cm), nutritional status data were determined using the indicator of Body Mass Index by Age (BMI/U), then the z-score was calculated by using the WHO AnthroPlus 2007 software (Beechy et al., 2012). Univariate analysis performed by each variable from the results of the study in the form of frequency distributions and percentages of each variable and bivariate analysis conducted on two variables allegedly related to cross tabulation between all dependent and independent variables by using the chi-square method and fisher exact. Interpretation; variable is accepted or significant if X^2 calculation> X^2 table (3.841) or p <0.05.

RESULTS AND DISCUSSION

Table 1 shows that of the 146 students there were 52.7% male and 47.3% female, the highest age group of 102 - 110 months as much as 20.5%, and the lowest age group of 138 - 146 months as many as 2.7%, the highest body weight of 20.1 - 28.1 Kg as much as 48.6%, and the lowest weight of 65.1 - 73.1 Kg and ≥ 74.1 Kg respectively of 0.7% and the highest height of 122 - 126 cm as much as 19.9%, and the lowest height of 107 - 111 cm as much as 3.4%.

Table 2 shows that of the 59 students who have over consumption patterns there were 47.5% of students who suffer from obesity. While from 87 students who have sufficient consumption patterns there were 17.2% obese students. The results of statistical analysis obtained the value of X^2 calculation (15.449)> X^2 table (3.841) and p-value (0.00) <0.05, this means that consumption patterns are associated with the incidence of obesity students in Rama Integrated Islamic Primary School Makassar City.

Table 3 shows that of 135 students who stated that they had received nutritional counseling there were 26.7% of students who were obese. While from 11 students who stated that they had never received nutritional counseling, there were 63.6% of students who were obese. The results of statistical analysis obtained the value of X^2 calculation (6.691)> X^2 table (3.841) and p value (0.010) <0.05, this means that nutritional counseling is associated with the incidence of obesity students in Rama Integrated Islamic Primary School Makassar City.

Relationship between Consumption Pattern and Student Obesity Incidence

The consumption pattern in this study is illustrated by the amount of energy intake, fat intake and protein intake. The chi-square test results showed that the three types of intake were significant for the incidence of obesity (p <0.05), where for energy intake> 2056.1 kcal/day had a chance of 28 times in obese students (OR = 28.4 in 95% CI: 13,161 - 61,105). While for fat intake shows that students who are obese have the opportunity to be exposed to obesity by 25 times compared to students who are not obese if the fat intake is> 69.6 gr day. Likewise for protein intake shows obese students have a chance to occur 2.7 times compared to students who are not obese if their protein intake is> 75.8 gr/day (OR = 2.7 in 95% CI: 1.526 - 4.843). This is consistent with research conducted in Brazil about the relationship between the level of knowledge and eating habits with the incidence of obesity in elementary school children also found that consumption patterns were the only variables that influence the incidence of obesity in elementary school students in grades III and IV, and the magnitude the influence of consumption patterns with an OR value of 5.3 (95% CI: 1.1 - 24.9) (Almarzooqi & Nagy, 2011; Häkkänen et al., 2016; Santos et al., 2014). The two results of the above research were supported by research by Yurni and Sinaga (2017) which stated that wrong eating habits in children will increase the risk of obesity (Yurni & Sinaga, 2017). These habits include eating frequency, snack eating habits, or snacks. This opinion is further refined by Halberstadt (2017) who stated that consumption patterns and eating habits in the Eastern Mediternia Region have changed in the past four decades (Halberstadt *et al.*, 2017). These changes indicate an increase in energy and fat intake per capita in almost all countries and this has a role in increasing the risk of obesity in this region (Fonseca et al., 2016). Changes are marked by a shift from the habit of eating traditional foods to western-style foods with characteristics of fat content, cholesterol, high salt and low fiber (Pahlevi, 2012; Mahdali et al., 2013).

The high energy, fat and protein intake in the obese student group has the potential to create an imbalance between calories intake and the calories used, leading to an increase in weight (Baker et al., 2011). This is in accordance with the opinion of CDC (2001) which stated that energy balance can be likened to a scale, where weight gain can occur when calories consumed are greater than the calories used (Caballero et al., 2017; Koski & Naukkarinen, 2017). A balanced consumption pattern, which is in accordance with the needs, along with the selection of the

Table 1. Distribution of Students' Characteristics in Rama Integrated Islamic Primary School Makassar City

Characteristic of Student	n	Percentage
Male	77	52.7
Female	69	47.3

Table 2. Relationship of Consumption Patterns with Student Obesity Incidence in Rama Integrated Islamic Primary School Makassar City

Consumption Pattern	Student Obesity				Total	X^2 (p)
	Obesity		Not Obesity			
	n	Percentage	n	Percentage		
Over	28	47.5	31	52.5	59	15.449
Sufficient	15	17.2	72	82.8	87	(0.00)

right food, will give birth to a good nutritional status. Food intake that exceeds the body's needs will cause overweight and other diseases caused by excess nutrients (Lee & Ham, 2015). Conversely, less food intake will cause the body to be thin and susceptible to disease. Both of these conditions are just as bad, so they are called wrong nutrition (Winther et al., 2017).

A balanced consumption pattern and the right choice of food are things to do. In addition to fulfilling nutritional needs also to avoid interactions that occur between nutrients that enter the body. Interactions between nutrients or non-nutritional substances can indeed have a positive effect, but can also be negative (Häkkänen et al, 2016). Students who have more consumption patterns are obese, this is because interactions can occur between a nutrient with another or non-nutritional substances (other than nutrients in food ingredients, usually not digested with normal metabolic pathways in the body and accumulation of fat in body) (Koski & Naukkarinen, 2017). For children through parents to be able to manage consumption patterns and get used to breakfast before the child goes to school, because the body needs nutrition intake from breakfast to maintain physical endurance and to improve learning skills. Parents play an important role in preparing children's school supplies that are healthy and safe for their children to consume so that food consumed by children can be monitored (Pahlevi, 2012; Valderhaug et al., 2016).

Relationship between Nutrition Counseling and Student Obesity Incidence

Information obtained from nutrition counseling is expected to help individuals and families who have never performed nutrition counseling to take steps in overcoming nutritional problems including changes in diet and solving nutritional-related problems towards healthy living habits (Fonseca et al., 2016). Nutrition counseling is still carried out conventionally, namely by conducting food history taking, reviewing nutritional problems, determining nutritional problems and nutrition interventions by determining the amount and type of food that must be consumed, then communicated to clients without regard to the client's readiness to receive information and intervention (Gifari et al., 2018). Nutrition counseling service in health service centers such as schools, hospitals and health centers have not paid much attention to children's readiness to receive information/dietary recommendations that must be carried out. The impact that arises with the counseling method is the lack of motivation of children to come back to consult to overcome their nutritional problems (Lestari & Dieny, 2016; Norén & Forssell, 2016).

Nutrition counseling is a very important part of disease prevention and health improvement because through counseling, individuals are taught to think about their own problems so as not to get sick (Pienaar, 2015). Correct and clear nutrition counseling is very needed by the childhood group, especially those associated with body shape and appearance will be very attractive to elementary school children, while in boys will be more interested when associated with the achievements of various types of sports (Lestari & Dieny, 2016). The behavior of elementary school students who do not support health can be transformed into obedient behavior in undergoing a diet, if the child already knows the impact and benefits of a low-calorie diet, internal awareness will arise to implement the low-calorie diet (Gifari et al, 2018). The attitude of children to be proper in carrying out a diet one of them relates to the extent to which nutritional counseling is

Table 3. Relationship between Nutrition Counseling and Student Obesity Incidence in Rama Integrated Islamic Primary School Makassar City

Nutrition Counseling	Student Obesity				Jumlah	X^2 (p)
	Obesity		Not Obesity			
	n	Percentage	n	Percentage		
Yes	36	26.7	99	73.3	135	6.691
No.	7	63.6	4	36.4	11	(0.01)

provided by nutritionists regarding knowledge, attitudes and actions (Norén & Forssell, 2016). The aim is to support behavior in increasing knowledge and attitudes and practices in choosing healthy and nutritious foods in an effort to have a normal weight (Zakaria et al., 2012). It is said that even though overweight children are given knowledge and dietary arrangements through nutrition counseling, but if the overweight children are unable to apply nutritional knowledge and diet in consuming low-calorie daily meals or the overweight children have difficulty in implementing so there is no change in expected weight (Ayu & Handayani, 2016; Norén & Forssell, 2016).

Intensive and structured nutritional counseling can help clients change behavior, from wrong behavior to right behavior (Faruqi *et al.*, 2015). Nutrition counseling conducted for overweight and obese children is expected to change the pattern and eating habits that are high in energy, high in saturated fat and low in fiber consumption, and increase physical activity. Research conducted by Wirakusumah et al in Palembang, showed that there was a significant difference ($p < 0.001$) for body food intake in overweight and obese adolescents after nutrition counseling (Gifari et al., 2018).

CONCLUSION

Consumption patterns and nutritional counseling were related to the incidence of obesity in students of Integrated Islamic Primary Schools.

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