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Relationship of Teacher's Role and Nutrient Intake with Obesity in Elementary School Student at Medan Maimun Sub-district, Indonesia

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Abstract: *Obesity is a problem of excessive fat accumulation and has a serious effect on health. The prevalence of overweight and obesity are in the children to increase significantly in the world. The objectives of this research are to analyze the relationships between teacher's role and nutrient intake with obesity in elementary school student at Medan Maimun Sub-district. The research design uses a cross-sectional study, has taken location at Elementary School in Medan Maimun sub-district. Samples were taken by simple random sampling of 120 students. Data were collected by using questionnaires, form food recall 2x24 hours, and BMI for age. Data analyzed using Chi-Square test. The result showed as 22,5% children were obese; the teacher's role were majority low (75%), and energy intake is under intake level Recommended Daily Allowance (55%). Bivariate analysis showed there is relation between teacher's role with obesity (p=0.008), energy intake (p=0.007) and fat intake (p=0.038) with obesity. Intake of protein (p=0.739) and carbohydrate (p=0.540) are not related with obesity. The management of obesity in children is recommended to change children's diet and lifestyle with family and teachers support at school.*
Keywords: *Obesity; teacher's role; nutrient intake; elementary school students.*

I. Introduction

Obesity is a problem of excessive fat accumulation and has a serious of effect on health. Obesity in children is a consequence of the intake of calories, which exceeds the number of calories released or burned through metabolic processes in the body. The prevalence of overweight and obesity in children increased significantly worldwide.

The survey on elementary students in the United States (2013) than 6800 children showed prevalence of obesity 5.7% in Kindergarten. Percentage of kindergarten children an average age of 5 and 6 years old, 12.4% were obese and another 14.9% are overweight, in the eighth grade average age 11 years), 20.8% were obese and 17.0% were overweight (International Journal of Obesity, 2013).

According the Center for Disease Control (CDC) percentage of children aged 6-11 years in the United States who were obese increased from 7% in 1980 to almost 18% in 2012 (CDC, 2014).

In Indonesia, according the Basic Health Research 2013 nationally showed that the problem of overweight and obesity in children aged 5 to 12 years respectively 10.8% and 8.8%, are already close to forecasts for the world in 2020. Terrain is among the 10 provinces with a prevalence of very fat above the national average (Ministry of Health of the Republic of Indonesia, 2012). Obesity in Medan city in elementary school children aged 6-12 years is 17.75% (Ministry of Health, 2012).

Based on the results of a preliminary survey on 120 students in grade five primary schools of Harapan 1, Harapan 2, Global Prima, 060898 and 060905 in Medan Maimun sub-district that students with underweight 6.7%, normal 53.3%, fat 17.5% and obese 22.5%.

Most students bring food to school, but the provisions do not meet the balanced nutrition of students, there are still many students who do not add vegetables and fruit in them lunch. Besides carrying supplies, they also buy a snack in cafetaria. Researchers looked snacks in schools does not meet the nutritional balance, due to the low in vitamins and minerals in these snacks, only high in carbohydrates and fats such as meatball skewers, pop noodles, fried noodles, light snacks, and milk cans.

Based on the results Focus Group discussion (FGD) is known that some primary schools in Medan was routinely carry out monitoring of the nutritional status of students by measuring weight and height of students, some schools do it once in 6 months, once in three months, once a year (every new school), and there is only dependent on the health center program. In addition to measuring height and weight students, there are also teachers who make the rules by limiting the students of pockets money not to buy snacks too excessive. If students bring a snack more than 50 thousand, then the child will be punished by teaschers.

The results of measurements of the height and the weight are not notified its usefulness to the students or the parents but it's only as school data only. While that is needed to be considered in the monitoring of the growth is toward growth weighting and measuring results are in accordance with the direction of the expected growth and an increase of weight should be accordance as weight according to age and nutritional status.

The formulation of the problem of this research is not yet known relationship roles of teachers and consumption patterns with the incidence of obesity in elementary school fifth grade students in Medan Maimun sub-district. The purpose of this research is to know the relationship the role of teachers and nutrient intake with obesity in elementary school students in Medan Maimun sub-district.

The benefits of this research can be used as a source of knowledge about the role of teachers and nutrient intake with obesity in elementary school students in Medan Maimun sub-district, for health education in order to better apply theory about children's health, especially about obesity in children school age, for health care services to provide educational guidance to parents, families and schools to prevent obesity in children and to participate in efforts to prevent obesity in children can then provide intervention in children with community obesity. Be a source of information and educating the public about eating behavior and nutrition what will be given to their children to prevent obesity.

II. Review of Literature

2.1 Obesity

Obesity is a state of excess fat in adipose tissue. The standard of obesity is if more than 20 percent of normal weight (Sherwood, 2014). Obesity is also interpreted as a result of calories coming in more than the amount calories burned by the body through metabolic processes (Ministry Health, 2012).

The Risk factors for obesity are divided into two groups. The both are modifiable and non modifiable risk factors (Ang et al. 2012). The Modifiable risk factors are such as dietary habit, physical activity, parental factors, the role of sleep time and socio-economic status. Meanwhile the risk factors for obesity that cannot be modified are the obesity to be caused by genetic, ethnic differences, and intrauterine factors.

2.2 Teacher's Role

The role of teachers is very necessary in the implementation of health promotion in schools, namely carrying out health education to students, both through curriculum-based subjects and specifically designed for health education. Monitor students' growth & development through weighing and height regularly every month or six months (Notoatmodjo, 2010).

2.3 Parents' Role

Parental responsibility for children's health is to be able to take the initiative in choosing the type of food that can meet the child's balanced nutrition, especially for high-income parents, but the fact is that many parents with high incomes actually choose the type and amount of practical food such as fast food and junk food and do not pay attention to the nutritional content of these foods (IDAI, 2013).

III. Research Method

The research design uses a cross-sectional study. The dependent variable in this study were the obese elementary school children as measured by BMI (Body Mass Index) for age, while the independent variables are gender, teacher's role, nutrient intake, which aims to determine the relationship of teacher's role, nutrient intake, with obesity in elementary school students in the Medan Maimun sub-district. Total population of the 5th grade elementary school students in the Medan Maimun sub-district are 544 schools.

The samples of this study are elementary school students in 5^{th} grade elementary school. Sampling was obtained using simple random sampling technique that takes all the population that meets the criteria for inclusion so that all samples fulfilled minimal. The minimum sample size is 85 samples. To minimize bias, the researchers add samples to 120 samples.

Data were collected by questionnaires to obtain the identity data samples. The role of teachers is taken by used a questionnaire of inquiries. Nutritional status is taken from the questionnaire and anthropometric measurements (weight and height). Nutrient intakes sufficiency level description (energy, protein, fat, carbohydrates), using methods as the form about food in *recall 2 × 24 hours*.

IV. Discussion

4.1 Univariate

The characteristics of the elderly by age and gender can be seen in the table below.

Table 1. Distribution of Respondents by Gender

Gender	Total	%
Man	67	55.8
Woman	53	44.2
Total	120	100

Table 1 showed the distribution of students by sex that as 67 people (55.8%) of male and 53 (44.2%) of female respondents.

Table 2. Distribution Role of Teachers

Teacher's role	Total	%
Lack	90	75.0
Enough	30	25.0
Total	120	100

Table 2 showed the distribution of role of teachers as 75% of lack of role teachers in obesity and 25% of role (enough of role).

Table 3. Distribution of Respondents Based on Nutritional Status

Nutritional status	Total	%
Not Obesity	93	77.5
Obesity	27	22.5
Total	120	100

In this study the distribution of students nutritional status and nutritional status are not obese as 93 respondents (77.5%), while the nutritional status of students as 27 people (22.5%).

Table 4. Distribution Sufficiency Frequency of Energy, Protein, Fat, and Carbohydrate

Nutritional adequacy	Frequency	%
Energy		
Not sufficient with RDA	66	55.0
Sufficient with RDA	54	45
Total	**120**	**100**
Protein		
Not sufficient with RDA	50	41.7
Sufficient with RDA	70	58.3
Total	**120**	**100**
Fat		
Not sufficient with RDA	52	43.3
Sufficient with RDA	68	56.7
Total	**120**	**100**
Carbohydrate		
Not sufficient with RDA	56	46.7
Sufficient with RDA	64	53.3
Total	**120**	**100**

Nutritional adequacy of student views based on the sufficiency of energy, protein, fat, carbohydrates and then grouped according to age and are categorized into two categories do not sufficient with RDA (Recommended Dietary Allowances) (More: 110% RDA and less: <80% RDA) and the comlpiance with RDA (Good: 80 -110% RDA).

The result showed that the level of energy sufficiency students RDA largely according as much as 55.0%. Protein intake most students are in the appropriate category RDA is as 58.3%. Protein deficiency can affect growth and brain development in children. If prolonged protein deficiency can lead to growth and development of the abnormal tissue, physical and mental harm on children, pregnant women may experience miscarriage, giving birth to premature infants, and anemia.

Carbohydrate intake of students based on the results of research that most of the compliance with RDA 53.3%. Based on the interview sheet a food recall 2x24 hours, it is known that carbohydrate intake respondents largely derived from the consumption of rice.

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Besides the intake of carbohydrates respondents were also obtained from the consumption of processed foods such as noodles, bread, and so on. One of the functions of carbohydrates is as saver protein, when carbohydrate foods are not sufficient, then the protein will be used to meet the energy needs of the body, beating its main function as a builder (Almatsier, 2010).

Fat intake of students based on the results showed in according to AKG fat intake as much as 56.3%. Based on the results of the sheet food recall, it is known that fat intake respondents mostly from foods fried in fat or oil, which is fried. In addition, the fat respondent intake comes from the consumption of meat, eggs, milk, and nuts. The human body needs dietary fat and fatty acids are essential for normal growth and development (Brown in Savitri, 2015).

3.2 Bivariate

From the data processing bivariate correlation between the teacher's role with obesity (p = 0.08). This study is in line with Purwandani (2017) showed the schools physical environment significantly (p <0.05) likely to reduce the frequency of consumption of fruits subject.

Tabel 5. Cross Tabulation between Nutritional Status with role of teachers

Teacher's role	Nutritional status not Obesity		obesity		total		*p*	*OR 95% CI*
	n	%	n	%	n	%		
Lack	75	83.3	15	16.7	90	100	0.08	.300 (0.120 to 0.751)
Enough	18	60.0	12	40.0	30	100		

From the data processing bivariate correlation between the teacher's role with obesity (p = 0.08). This study is in line with Purwandani (2017) showed the school's physical environment significantly (p <0.05) likely to reduce the frequency of consumption of fruits subject. This is because the physical environment (such as a school canteen) does not provide the fruit and other high-fiber foods in the food choices of students while at school. Potentially significant economic environments school lowered the frequency of consumption of fruit, increasing the frequency of consumption of fast food and soft drinks subject.

The role of teachers according to Mike, David and Jon (1997) can bring positive or negative influence on their students. The results of further analyzes on the item the role of teachers who score poorly are more than most is the teacher does not forbid students to snack at 63.2%, does not monitor your weight regularly learners 56.9%, prohibit students play a sweat at the moment recess by 55.2% and did not empower small physician should weigh on a regular basis by 58% and 50.6% do not recommend drinking at least 8 glasses a day. A total of 80.5% of respondents said that available in the school cafeteria. Observations made that all school food vendors settled there but no coaching cafeteria / shop healthy.

According to Clarke (2015) hour time allotted for rest and exercise have a significant impact on school children's physical activity levels, especially for boys. Thus, policies and practices in schools can have an impact on children's health and should support families to prevent obesity in children. School is seen as key to preventing obesity because the majority of children have a long time and communication within them (Lobstein et al., 2015).

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Table 6. Cross Tabulation between Nutrien Intake with Nutritional Status

Nutrition Intake	Nutritional status				Total		*P*	OR 95% CI
	Not Obesity		Obesity					
	n	%	n	%	n	%		
Energy intake								
Not sufficient with RDA	45	68.2	21	31.8	66	100	0.07	3,733 (1.381 to 10.090)
Sufficient with RDA	48	88.9	6	11.1	54	100		
Protein intake								
Not sufficient with RDA	38	76.0	12	24.0	50	100	0.739	1.1158 (0.488 to 2.748)
Sufficient with RDA	55	78.6	15	21.4	70	100		
Fat intake								
Not sufficient with RDA	45	86.5	7	13.5	52	100	0.038	0.373 (0.144 to 0.967)
Sufficient with RDA	48	70.6	20	29.4	68	100		
Carbohydrate intake								
Not sufficient with RDA	42	75.0	14	25.0	56	100	0.540	1,308 (0.544 to 3.085)
Sufficient with RDA	51	79.7	13	20.3	64	100		

There is a relationship between energy intake with obesity (p = 0.08). This is in line with research Simatupang (2017). Chi-square test results showed that the three types of intake significantly with obesity (p <0.05), which for energy intake >2056.1 kcal /day, likely 28 times occurred in students obesity (OR = 28.4 at 95% CI: 13.161 to 61.105). In line with these results, supported by several studies including research results Yamin (2013) in Manado City there is a relationship between energy intake with obesity in elementary school children in the city of Manado. Retrieved OR value of 4.058 (95% CI=1.320 to 2.417) (Yamin, 2013). This is consistent with other research Medawati Ana et al. (2015) In Yogyakarta, which concluded that the higher the intake of energy the higher the likelihood for obesity in adolescent and the higher the higher the fat intake to obesity. Siregar (2019) in South Labuhanbatu , which family and environmental support greatly influences nutritional consumption behavior.

The results showed a correlation between fat intake with obesity (p=0.038). In line with the research Evelyn (2013) there is a relationship between fat with overweight. High intake of energy, fat and protein in the group of obese students, potentially on the imbalance between calorie intake with calories used, causing weight gain. This is in accordance with the opinion of the CDC (2014) which states that energy can be likened to balance the scales, where the weight gain can occur when the calories consumed is greater than the calories used.

There was no relationship of carbohydrate and protein intake with the incidence of obesity. This is in line with research Simanjuntak (2010) which stated that there was no significant relationship between nutritional status and protein intake. This study is in line with Evelyn (2013) showed no association between carbohydrate intake and nutritional status overweight by students in Bekasi. Mardatillah (2014) in a study of students at SMA Islam PB Jakarta also found that there was no correlation between carbohydrate intake with overweight on teens.

Research Evelyn (2013) also showed no association between protein intake and nutritional status overweight students in Bekasi. In line with Mardatillah (2014) also showed that the protein intake was not associated with more events in adolescents.

According Istiani (2013), the consumption of a person's diet affects the nutritional status of the person. The better a person's consumption of food the more nutrients are fulfilling that support the growth and development, especially for school children who need energy and other nutrients relatively increased.

V. Conclusion

There is a relationship between the roles of teachers with obesity in elementary school students in Medan Maimun Sub-district. There is a relationship between energy intake and fat with obesity elementary school students at Medan Maimun Sub-district.

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