Analysis Of Nutrients Intake On Lunch Primary School Students: Do They Meet Nutrients Standard?

Anita Rahmiwati, SP.,MSi[1], *Fatmalina Febri, SKM.,MSi[2]

Abstract - Childhood is a time that is susceptible to various diseases caused due to deficiency   nutrients. Full day school model for elementary school student with school feeding gives positive contribution by increasing children nutritional status. Some food served in school feeding should generate 1/3 total energy needs of the child (Mahan & Stump 2004). The purpose of this study was to analyze the nutrients intake on lunch primary school students.The design of the study is observational analytic method with cross-sectional approach. This study was conducted in the Integrated Islamic Primary School Integrated Bina Ilmi Palembang, South Sumatra, Indonesia. The number of students who participated in this study were 64 students consisting of 32 students who bring lunch from home and 32 students who follow school lunch feeding. Average energy and protein intake of students who bring lunch from home is better than the students who follow school lunch feeding. There are significant differences between the levels of energy and protein sufficiency both of group students ($P <0.05$). There are significant differences between the levels of nutrition knowledge both of group of students ($P <0.05$). Students who follow school lunch feeding has a thinner on Body Mass Index (BMI)   than students who ate lunches brought from home provision that 21 students (60 %). There was no difference between the nutritional status of groups of students ($P> 0.05$). It is need to increase the quality and amount menu on school lunch feeding.

Index Terms- Nutrient intake, lunch, primary school

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1   INTRODUCTION

School-Age Children are national investment. The Optimal of growth and development's school-age children is influenced by the amount and quality of nutrients intake which provided in the diet. Healthy foods are foods which contain all the nutrients needed by body. Balanced diet obtained from a variety of foods, both animal and vegetable material (Rositawaty 2007; Rusilanti 2007).

In addition, childhood is a time that is susceptible to various diseases caused due to deficiency or excess nutrients. According Riyadi (2003) school-age children are in a period of very rapid growth with a very active physical activity. Therefore, school-age children should get special attention on the food consumed in order to obtain healthy and nutritious food to meet their nutritional needs.

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[1]Faculty of Public Health, Sriwijaya University
[2] Faculty of Public Health, Sriwijaya University
    ***Corresponding author**: Tel: +62071158009,
         Email: reneetha16@yahoo.com

Nutritional disorders could be caused by obesity or malnutrition. Malnutrition found in the school age group can be particularly lead to impaired growth, fatigue, predispose to infected of disease and imbalance of energy consumption, due to the energy expended is less than the energy input. The change of diet from a traditional habit in high carbohydrates consume, high in fiber and low fat diet changed to a new habit in low carbohydrates consume, low in fiber and high in fat also supports the nutrition (Almatsier 2003).

The government has established and organized in the field of nutrition policy for the improvement of the nutritional status of the people in accordance with Law No.. 7 of 1996 on Food. Yuliati and Santoso (1995) says that implementation of the school meal aims to improve the nutritional status, especially for school children who do not have time for breakfast and did not bring lunch, improve academic performance.

Implementation of school feeding is one of alternative that can be done to overcome the

problems associated with food in school-age children. Some food served in school feeding should generate 1/3 total energy needs of the child (Mahan & Stump 2004) Moreover, to energy needs , keep in mind the variety of food , children 's favorite , and the amount of food provided .

However, there are not all students follow the school lunch feeding, there are students who bring food from home . One of the reasons parents prepare their food for their children is to make sure that their children get good nutrition. This could be due to the concerns of parents about snack food that may be consumed by children, even including the fears of food catering provided by the school , both in the aspect of cleanliness and worries the nutrient adequacy of both the food . Bring lunch habits in children when the school provides several benefits , among others, to avoid the interference of hunger and snack habits . It's also prevent children from the dangers of unhealthy snacks and unsafe.

Although , basically the implementation of school feeding activities are expected to eliminate the concerns of parents regarding their children food consumed at school . Besides catering procurement can be a medium to introduce various types of food that may not be preferred by children when served at home . Based on the above , the authors are interested in examining the energy and nutrient content of the food catering provided by the school and the provision of food provided by the parents , as well as comparing the nutritional status in children who consume foods from school catering to children who consume food supplies from home.

The purpose of this study was to analyze the nutritional quality of the lunch menu and the consumption of energy and protein adequacy level of elementary school students.

2 METHODOLOGY

The design of the study is observational analytic method with crossectional approach. This study was conducted in November-December 2013 in the Integrated Islamic Primary School Integrated Bina Ilmi (SD IT Bina Ilmi) Palembang, South Sumatra,Indonesia. The number of students who participated in this study were as many as 64 students consisting of 32 students who bring lunch from home and 32 students who follow school lunch feeding.

The data characteristics of respondents (date of birth , weight , height) and nutrition knowledge was collected using a questionnaire . Weight were

collected using a weight scales *Seca Digital Scales* (accuracy 0.1 kg) . Height measured by using *Microtoice Height* . Food consumption data use a *food -weighing* (Gibson , 2005) . Food consumption data obtained from the average food consumption for two days.

Data analysis was performed by descriptive and inferential. Food consumption data is converted into energy and protein by using software *Nutrisurvey*. Measurement of nutritional knowledge were categorized into three groups: knowledge of good nutrition, moderate and less (Khomsan , 2000) . Measuring the level of nutritional adequacy (% RDI) is done by comparing the content of energy and protein for two days on the lunch menu students with AKG 2004 in persen. Level of adequacy energy and protein are classified into good (30 % RDA) and less (< 30 % RDI). Measurements of nutritional status carried by body mass index for age (BMI / U) . Calculation of IMT / U using *AnthroPlus* , by entering data weight , height and age of children (WHO 2007). To determine differences in consumption and energy and protein adequacy level students who bring lunches in schools and the catering is done by t-test .

3 RESULTS

3.1 Characteristics of Respondents

The percentage of sample in this study was almost the same by gender, where 53.1% female sample and 46.9% male sample. Table 1. illustrates that most of the respondents are at the age of 10 and 11 years (40.6%).

Age	n	%	Total
9	10	15.6	15.6
10	26	40.6	56.2
11	26	40.6	96.9
12	1	1.6	98.4
13	1	1.6	100.0
Total	64	100.0	

Table 1. Age Distribution of Respondents

3.2 Nutrition Knowledge

Table 2. shows that the students who have good knowledge about nutrition dominate by students are taking a lunch catering provided by the school is 13 students (56.5%). Based on the results of t-test, there are significant differences between the levels of nutrition knowledge group of students who bring lunch from home and students who follow school lunch feeding (P <0.05).

3.3 Level of Energy Sufficiency

Based on Table 2 Average energy sufficiency level in the group of schools catering wholly examples include the category of less (100 %). This is because the type and amount of food consumed is not as needed . Based on the results of t-test , there are significant differences between the levels of energy sufficiency group of students who bring lunch from home and students who follow school lunch feeding
(P <0.05).

3.4 Adequacy of Protein Levels

Table 2. show that Level adequacy of protein good is only found in the students who ate lunches brought from home are 23 students (71.9%). While protein intake on students who consumed lunch catering provided by the whole school is 32 students (100%) has less protein intake.
Based on the results of t-test, there are significant differences between groups of protein adequacy level students who bring lunch from home and students who follow school lunch feeding (P <0.05).

3.5 Nutritional Status

Based on Table 2, students who have a Body Mass Index (BMI) is a thinner than students who ate lunches brought from home provision that 21 students (60 %) . While students who have a Body Mass Index (BMI) is a normal, more numerous found in students who consume school lunch feeding is provided from school is 16 students (66.7 %) . As for students who have a Body Mass Index (BMI) more fat is consumed lunch students brought lunch from home is 3 students (60 %) . Based on the results of t-test , there was no difference between the nutritional status of groups of students who bring lunch from home and students who follow school lunch feeding (P> 0.05).

Variable		Lunch	Siang		Total	%	P Value
	Bring Food Home	%	Catering	%			
Nutrition Knowledge :							0,0363
Good	10	31,2	13	40,6	23	35,9	
Moderate	11	34,4	6	18,8	17	26,6	
Less	11	34,4	13	40,6	24	37,5	
Energy Intake:							0,011
Good	7	21,9	0	0	7	10,9	
Less	25	78,1	32	100,0	57	89,1	
Protein Intake:							0,000
Good	23	71,9	0	0	23	35,9	
Less	9	28,1	32	100,0	41	64,1	
Nutritional Status:							0,118
Underweight	21	65,6	14	43,8	35	54,7	
Normal	8	25,0	16	50,0	24	37,5	
Overweight	3	9,4	2	6,2	5	7,8	
Total	32	50	32	50	64	100	

Table 2. Analysis of Variables in Study
T-test

3.6   The relationship between energy intake, Protein with Nutritional Status

The relationship between energy intake and nutritional status examined using Fisher's exact test with a significance value of 0.05 and percentage analysis, the results of the analysis not founded significant relationship between energy intake and nutritional status based on BMI by age. The relationship between protein intake and nutritional status examined using Fisher's exact test with a significance value of 0.05 and percentage analysis, the results of the analysis found no significant association between protein intake and nutritional status based on BMI by age.

4   DISCUSSION

Children age 6 to 12 years are included in the final phase of childhood (late childhood) until the child becomes sexually mature at age 13 years for girls and 14 years for boys (Hurlock, 1980). Therefore, at this age need adequate food intake in terms of both quantity and quality.

Nutritional knowledge is knowledge about food and nutrition, sources of nutrients in foods, food safety to eat so is not to cause disease and how to process food properly so the nutrients in food are not lost, and how to live healthy (Notoatmojo, 2003). The level of nutrition knowledge affect a person's attitudes and behavior in food choices that will ultimately affect the nutritional status.

Implementation of school meals is one alternative that can be done to overcome the problems associated with food in school-age children . School feeding program should be one third of the total energy needs of the child (Mahan & Stump 2004) . Figures based on nutrition needs of school-age. At the age of those substances - nutrients needed quite high . Energy in the body to function for growth , namely for the synthesis of compounds - a new compound . One of the functions of carbohydrates as an energy source which is the main function of carbohydrates is to provide energy for the body (Almatsier , 2002).

According Almatsier (2002) due to the low nutrient status of the direct and indirect causes . The immediate cause one of which is the consumption of less food. While not a direct cause of the dominant economic level less include, general education and nutrition education is lacking. According Suharjo (2003) , nutritional status is the state of health of an individual or group that is determined by the degree of physical needs for energy and substances - other substances obtained from food is measured anthropometry physical impact . Adequate nutrition is required each person to achieve optimal growth . According Almatsier (2002) , optimal nutritional status occurs when the body gained quite substances - nutrients are used efficiently .

At the age of 6-12 years (school age children) many of which affect their eating habits. New experiences, excitement in the school, a sense of fear that late arriving at school, causing the child - the child often aberrant breakfast (Moehji, 2003). Soekirman (2000) says that the habit of eating snacks is one which causes the energy consumption of good food, they are low in protein. Because in this age of the child - the children loved to snack, sometimes they deliberately refused breakfast and their snack instead.

5   CONCLUSION

From the results and discussion that has been described can be deduced as:
1. Average energy intake of students who bring lunch from home is better than the students who follow school lunch feeding .
2. Average protein intake of students who follow schools lunch feeding is less than the recommended daily number .
3. Students who follow school lunch feeding has a thinner Body Mass Index (BMI) than students who ate lunches brought from home (60 %).
4. The absence of a significant association between the intake of energy and protein nutritional status of students who ate a lunch from home.

Suggestion
From the conclusions that have been drawn researchers gave suggestions as follow:
1. To increase energy and protein intake of students, need to increase the quality and amount on school lunch feeding.
2. Required for counseling to parents and students about eating right and healthy to increase nutrition knowledge.

Ethical considerations
Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

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REFERENCES

[1]   Rositawaty S. 2007. 25 Healthy Tips Fit. Bandung : PT. Karya Kita

[2]   Rusilanti. 2007. Healthy Fruit Juice. Jakarta : PT. Agromedia Pustaka.

[3]   Riyadi H. 2003. Antropometry Nutritional Assessment [handbook]. Bogor: Human Nutrition and Family Resourses Department, Faculty of Agriculture, Bogor Agrycultural University.

[4]   Almatsier S. 2003. The Basic Principles of Nutrition Sciences. Jakarta: Gramedia

[5]   Yuliati LN, H Santoso. 1995. Nutrient Management Institution. Jakarta : Ministry of Education and Culture Directorate General of Primary and Secondary Education. Directorate of Vocational Education.Vocational Education Improvement Project and Non-Engineering II.

[6]   Mahan LK, Stump SE. 2004. Krause's Food, Nutrition, & Diet Therapy 11th Edition. USA : Elsevier.

[7]   Moehji. 2009 In : Rakhmawati. Contributions Food In Schools And Energy Adequacy And Substance Nutrition In Childhood Elementary School in the city of Bogor. Department of Community Nutrition, Faculty of Human Ecology, Bogor Agricultural University. Bogor.

[8]   Gibson, Rosalind.2005. Princeples of Nutritional Assesment.Second Edition.Oxford University Press.

[9]   Khomsan,Ali.2000. Food and Nutrition for Health. Department of Community Nutrition. Faculty of Human Ecology. Bogor Agricultural University. Bogor.

[10] WHO.2007.BMI for Age (5-19 years).World Health Organization from: http://www.who.int/childgrowth/standards/bmi_for_age/en/index.html

[11] Hurlock.1980.Developmental Psychology: life-span approach.McGraw- Hill Companies.

[12] Notoatmodjo, Soekidjo 2003. Health Education and Behavior. Rineka Reserved. Jakarta.

[13] WNKPG.2004. Food Security and Nutrition in the Era of Regional Autonomy and Globalisasi.LIPI: Jakarta.

[14] Suhardjo.2003.Education of Nutrition .PT Earth Literacy Education. Jakarta.

[15] Soekirman.2000. Science of Nutrition and Its Application for Family and Community. DIKTI: Jakarta.