Relationship of Knowledge, Frequency of Vegetable and Fruit Consumption and Nutritional Status in Elementary School Students In Cimahi City

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Abstract Background: Vegetables and fruit have advantages as a source of antioxidants, fiber, vitamins and minerals that play an important role in the prevention of infectious diseases and is not contagious. The prevalence of elementary school students who consume fruits and vegetables found the low allegedly due to low knowledge as well as consumption patterns of fruit and vegetable which is less good. The intake of vegetable and fruit that are low on the children associated with the risk of infectious diseases in adulthood. Aim of this study is to identify correlations of knowledge, patternof fruit and vegetable consumption, and nutritional status in elementary school children in the city of Cimahi.

Methods: Location of the study are five public elementary schools in kelurahanPasirkaliki, Cimahi which are taken purposively. There were 47 students who participated in this study. Participants were students at 4th and 5th grade in selected elementary schools which are taken by systematic random sampling. This research design is cross sectional, the time of data collection research was conducted in july-september 2016. Data analyzed using Spearman's rho test.

Results: the research showed that student's knowledge didn't correlate with the frequency of fruit and vegetable consumption (p=0.445), frequency of fruit and vegetable consumption didn't correlate with the body mass index of students (p=0.206).

Conclusions: there were not correlation of knowledge, frequency of vegetable and fruit consumption, and nutritional status from this study. There may be a need an intervention to promote of balanced nutrition guidelines for eating fruits and vegetables so that students increase fruit and vegetable consumption at every meal.

Keywords: elementary school students,knowledge, nutritional status, patterns of fruit and vegetable consumption,.

Background

Vegetables and fruit are foods that are low in fat, rich in fiber, important sources of vitamins and minerals for the body. Vegetables and fruit, rich in dyes that act as a source of antioxidants for the body if consumed adequately.

Vegetables and fruits are low-fat, low-calorie foods which, when consumed in less quantities, are at risk of developing hypertension, type 2 diabetes mellitus, hypercholesterolemia, pancreatic cancer.[1-2] Adequate or high fruit and vegetable intake is associated with a reduced risk of metabolic syndrome so prevention is recommendedprimary cardiovascular disease.[1]

The Indonesian Ministry of Health's Balanced Nutrition Guidelines recommends consumption of vegetables and fruit for children is 300-400 grams a day. [3] Based on the results of the basic health research (riskesdas) in 2007, 93.6% of Indonesian people lacked fruit and vegetable consumption and 93.5% of the 2013 primary risk.[4-5] The low prevalence of vegetable and fruit consumption in West Java province based on 2013 risk is 96.4%, Cimahi City is 96.4%.[5]

The prevalence of obesity at the age of 5-12 years in West Java in 2013 was 18.8% .[5] One of the causes of obesity in children is lack of consumption of vegetables and fruit. Consumption of vegetables and fruit is part of a healthy lifestyle. Personal and social factors are factors that support the daily intake of vegetables and fruits of school children. Contributing social factors are parental attention, family eating habits, availability of vegetables and fruit at home. [6-7] This study was aimed at studying the relationship between knowledge, eating habits, and nutritional status in elementary school children in Cimahi City.

Materials and Methods

Hypothesis and Sampling Method

This research is a cross sectional study, which was conducted in five locations of selected primary schools in Cimahi City. Data collection has been carried out in July - September 2016.

The research hypothesis are (1) student knowledge is closely related to the consumption pattern of vegetables and fruits is good; (2) consumption patterns of vegetables and fruits are closely related to good nutritional status. Data collected were students' knowledge, mother's education, patterns of consumption of vegetables and fruits, patterns of consumption of vegetables and fruits, nutritional status.

The research subjects were 47 fourth and fifth grade elementary school students from five selected primary schools in Cimahi Utara sub-district, Cimahi, SDNPasirkaliki 1,3,4,5,6. Withdrawal of research subjects was carried out by proportional stratified random sampling from frame sampling of students in grades 4 and 5 who met the inclusion criteria. Furthermore, the determination of research subjects was taken by systematic random sampling to take research subjects in each class, by determining randomly for the first research subjects, then according to the multiple interval results of the calculation of the total research subjects divided by the minimum number of research subjects, population of 264 students and number minimum research subjects were 47 people.

The inclusion criteria for the research subjects set are as follows: 1) easy to communicate; 2) not being sick so that they are uncomfortable and have difficulty remembering; 3) students express their willingness; 4) parents (mother) express theirwillingness; 5) recall data of 1x24 hour consumption for 2 consecutive days is fulfilled.

Data Collecting

Research data were collected simultaneously with students and their mothers by means of interviews. Interviews were conducted to obtain data on the characteristics of the research subjects, maternal education, frequency of consumption of vegetables and fruit.

Student knowledge data was collected by giving a questionnaire containing 10 questions about knowledge of nutrition, vegetables and fruit. Each correct answer is 1 and 0 is for an incorrect answer. The knowledge score is determined based on the number of correct answers divided by the number of questions multiplied by one hundred.

The frequency of consumption of vegetables and fruit is collected by interview and used semi-quantitative feeding frequency format (SFFQ) and 2x24 hour recall on holidays and weekdays. Food photograph and food research subjects are used as a tool.

Measuring height (accuracy of 0.1 cm) and digital scales (accuracy of 0.1 kg) were used to measure student height and weight. Furthermore, the data is used to calculate the body mass index (BMI) of the body and interpretation of nutritional status based on BMI by age (BMI/A).

Data Processing and Analysis

Data that has been collected is processed manually and computerized to convert data into information. The steps in data processing are carried out as follows: 1) editing, 2) coding, 3) data entry into the software statistic, 4) cleaning. The collected data is processed so that the following information is obtained:

1) characteristics of research subjects,

2) nutritional status

3) knowledge score

4) the frequency score for vegetable and fruit consumption.

The frequency score for vegetable and fruit consumption is determined based on the number of vegetables andfruit consumed, the average frequency of consumption of vegetables and fruits in food one day. The score for the amount of vegetables and fruits consumed is obtained from the average weight (grams) of vegetables and

fruits consumed, the results of repeated 24 hour recall are not consecutive. Consumption of fruits and vegetables 300-400 grams a day were given a score of 5, consumption of fruits and vegetables <300 grams were given a score of 3, consumption of vegetables and fruit <100 grams were given a score of 1, no fruit or vegetable consumption was given a score of 0. Frequency score for eating vegetables and fruit and fruit are obtained from the average score of eating habits, with the following assessment: the answer never gets a score of 0, sometimes scores 1, often scores 3, each time scores 5.

Data analysis was carried out in a univariable and bivariable manner. Univariable analysis aims to describe the characteristics of the research subjects, the research variables are knowledge, frequency of consumption of vegetables and fruits, nutritional status. Bivariable analysis was carried out after the normality test of knowledge score data, frequency of vegetable and fruit consumption scores, nutritional status. Data normality test was used by Shapiro Wilks test and the results were obtained that the knowledge score, frequency of vegetable and fruit consumption scores, body mass index according to age were abnormally distributed because the value of p <0.05. Used the Spearman Correlation Test on bivariable analysis because data distribution is not normal. Data analysis was carried out using a software statistical program for windows at a 95% confidence level with a p value of ≤ 0.05.

Results

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The characteristics of the research subjects included gender, class, duration of maternal education shown in table1.

Table 1. Distribution of Characteristic of Subjects

Characteristics	n	%
Age (years)		
• < 10	13	27,7
• ≥ 10	34	72,3
Sex		
• male	16	66,0
• female	31	34,0
School's grade		
• 4	24	51
• 5	23	49
Duration of Maternal Education		
• 6 years	10	21,3
• < 9 years	2	4,2
• ≥ 9 years	35	74,5

Based on **table1.** the distribution of the characteristics of the research subjects that looked different was the gender and duration of the mother's education. Most of the research subjects were more than 10 years old (72.3%) and had the most distribution at 10 years of age (42.6%), most were female (66.0%), most of mother's education period was 9 years (74.5%).There were no education more than 12 years found in this study.

The median, variance, minimum, and maximum score of the knowledge, BMI / U consumption and vegetable frequency scores are shown in the following **table 2**.

Table2. Median, variance, minimum, and maximum values of the Variables

Variables	Med.	Var.	Min.	Max
BMI/A	16,3	7,9	12,1	24,1
Knowledge score	5,0	2,7	1,0	8,0
Frequency of vegetable and fruit score	3,0	4,1	1,0	9,0

The results of the research data collection, obtained information that most research subjects answered incorrectly on the questions about the nutrients contained in vegetables and fruits (4 questions), how to process vegetables (1 question), how to wash vegetables and fruit (1 question), large portion of vegetables and fruit (1 question). Based on the frequency of eating vegetables and fruits of the research subjects, 83% answered often consuming vegetables and fruits but based on the repeated 24 hours recall methodthe amount of vegetables and fruits consumed is very little.

Testing the research hypothesis is used Spearman rho test because the data is not normally distributed. The test results are presented in **table 3**.

Table 3.Analysis of Bivariate Correlation knowledge and frequency of vegetable and fruit consumption, frequency of vegetable and fruit consumption and BMI/A

IndependentVariable	DependentVariable	Spearman's rho test (p)
Knowledge	Frequency of vegetable and fruit consumption	0,445
Frequency of vegetable and fruit consumption	Body Mass Index/Age	0,206

Information obtained in Table.3 shown that there is no correlation between variables in this study. It is proven by the results of testing the bivariate statistics p> 0.05 at the 95% confidence level.

Discussion

The results of the 2013 Riskesdas obtained information that vegetable and fruit consumption was lacking in children aged ≥ 10 years in West Java province 96.4% and Cimahi City as much as 96.4%.[6] Based on gender, the majority of research subjects were women . Female sex is the dominant one found in the population of fourth and fifth grade students at the study site. Based on age, the 9-10 year age group has a greater proportion than the 11-12 year age group. Ages 9-12 years old, including the age group of children, habits and eating patterns of children are largely determined by their eating habits and family eating patterns. Based on nutritional status, most of the research subjects were normal (92%). Thus, most research subjects did not have nutritional problems based on body mass index indicators.

The results of the bivariate analysis of the correlation of knowledge on the consumption patterns of vegetables and fruits showed insignificant results. Based on the analysis of the answers to questions about students' knowledge, in partlarge students answer incorrectly on questions about nutrients that are mostly contained in vegetables and fruits (4 questions), how to process vegetables (1 question), how to wash vegetables and fruit (1 question), large portions of vegetables and fruit (1 question). Knowledge should be the basis for attitude and behavior. In children, it seems that knowledge alone is not enough to make good provision of good behavior must be accompanied by examples from parents [8-9]. Allegedly, the results of this knowledge relate to the students' knowledge of balanced nutrition which has not been well socialized so far, in this study knowledge of balanced nutrition was not assessed. This assumption was supported by the results of the study that knowledge and understanding of the food pyramid or balanced nutrition guidelines will foster self-awareness about the portion of vegetables and fruits that must be consumed every day. Thus the willingness and preferences of school children to eat vegetables and fruit will arise.[9]

The results of the bivariate analysis of the frequency of consumption of vegetables and fruit showed insignificant results. Based on data analysis, the average number of vegetables and fruits consumed by the research subjects was 50 grams (approximately 1/6 portion). This average is calculated from research subjects who consume vegetables and fruits, because quite a number of research subjects who do not consume vegetables and fruits according to the results of recall are not 24 consecutive hours. Research subjects who consume vegetables and fruit, on holidays (weeks) also consume vegetables and fruit. Meanwhile, other research subjects who did not eat vegetables and fruit consumed more snacks on holidays. The proportion of research subjects for women and men who consumed vegetables and fruits was almost the same, namely 61.3% and 62.5%. This result is different from the other study thatfound that female students preferred to consume fruits and vegetables than men.[10].

Referring to the results of this study, there were still more than 30% of research subjects who did not consume vegetables and fruit based on 2x24 hour recall consumption. There are several possibilities for research subjects not to consume vegetables and fruit, namely because they do not like it, because it is not unusual to eat vegetables or fruit in the family, because it is not provided at home, because there are other foods that are more interesting to consume thanvegetables or fruit. Vegetables and some fruits are the foods that least invite appetite, this may be caused by vegetables and processed vegetables, it doesn't taste good on the tongue. A lot of evidence shows that taste / taste greatly influences food selection.[10] Vegetable and fruit intake of school children is strongly influenced by the preferences and availability of vegetables and fruits at home. The relationship is also very close when parents also consume enough vegetables and fruits at home.[11-12]Most research subjects have BMI/A values that are good according to the normal category. Although from the study results the frequency of consumption of vegetables and fruits is still high but the nutritional status of most subjects is good.

Conclusions

The results showed that there was no correlation between knowledge and frequency of vegetable and fruit consumption, there was no correlation between the frequency of consumption of vegetables and fruits with statistical BMI (nutritional status).

It is recommended to improve nutrition knowledge the school cooperates with the health department or Health Ministry of Health Bandung to periodically provide nutrition and health counseling. Agreement was made with parents to bring food supplies containing vegetables and fruit. This study still has many limitations because the supporting factors for the consumption of vegetables and fruits are quite important, the data is not collected.

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