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Submission date: 06-Dec-2021 09:20PM (UTC+0700)
Submission ID: 1722205768
File name: ability_of_Fruits_and_Vegetables_Among_High_School_Students.docx (42.3K)
Word count: 2511
Character count: 13419

Food Pattern and Availability of Fruits and Vegetables Among High School Students

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Most of Indonesian teens (93,7%) had a lack of fruits and vegetables consumption (Balitbangkes, 2013). This fact would give contribution to increasing number of degenerative disease prevalence later on. It is important to know the variety of teens consumption on fruits and vegetables especially its food pattern. The objective in this study was to investigate the food pattern and availability of fruits and vegetables among high school students. It was a cross-sectional study sited at SMA 8 Pekanbaru on January-April 2015. 65 high school students were randomly selected among 844 students. The food pattern of fruits and vegetables variable consist of type, frequency and amount of fruits and vegetables consumption were taken using FFQ questionnaire and 2x24 hours fodd recall in non-consecutive day (1-day week day, 1-day week end). Availability of fruits and vegetables were using semi-structured questionnaire regarding availability of fruits and vegetables at school and home. All data were analyzed descriptively using data processing softwere. Type of fruits they mostly consumed were orange, apple and banana. Spinach, water spinach and chayote were the mostly consumed vegetables among respondents. Only half of students (60% and 55.38%) ate more than 2x fruits and vegetables respectively. About 43.08% students ate less than 200 grams per day and 41.54% students ate less 300 grams per day. The availability of vegetables was mostly at home (87.69%) rather than at school (29.23%). On the other hand, the availability of fruits was almost the same between at home and school (35.38% and 32.3% respectively). It is necessary to give nutrition education regarding the important of fruits and vegetables consumption especially wide variety types of fruits and vegetables.

Keywords: Fruits and vegetables; adolescent; food pattern

INTRODUCTION

Based on Basic Health Research (Riskesdas) 2013, about 93,7% of adolescents in Indonesia consume less fruits and vegetable. This of course shows that fruit and vegetable consumption behavior of the Indonesian population is still in the low category with the level of fruit and vegetable consumption is less than 5 servings per day as recommended by the WHO (Balitbangkes RI, 2013).

Consuming fruits and vegetables are on of the requirements to meet the nutritional balanced menu. Vegetables and fruits are important foods that should always the consumed with every meal. Most of the teenagers prefer to consume fodds with saturated fats and high energy. It is seen that it was more

than the recommendation and also the high levels consumption of food and beverage with artificial sweeteners, but low for fruits and vegetable consumption (Puspitarani, 2006).

Based on research by Achmad, Hadju and Salam (2013) on the behavior of fruit and vegetable consumption among adolescents was still relatively low. From these results obtained on average in one day teenagers ate one serving of fruit (45,2%) and a serving of vegetables (32.3%). A total of 9.7% of adolescents did not consume fruits and 38.7% of adolescents did not consume vegetables. This shows that the quantify of fruits and vegetable consumption behavior of the child is still not meet the standards. Based on the description above, the researchers were interested in conducting research on consumption patterns and the availability overview of vegetables and fruits on the students of SMA Negeri 8 Pekanbaru.

METHOD

This type of research was a descriptive study using cross-sectional study design. The study was conducted in Januariy-April 2015 at SMAN 8 Pekanbaru. The population was the entire students of class X-XI SMA Negeri 8 Pekanbaru, amounting to 844 students with a total sample of 65 students. Number of sample were calculated by the formula for sample survey using simple random sampling according to Lwanga & Lemeshow (1998) with a 90% confidence level. Data had been collected through interviews using Food Frequency Questionnaire (FFQ) to determine the pattern of consumption of vegetables and fruist including types and eating frequency. List of fruits and vegetables were listed in a FFQ quesstionnaire in a daily, weekly, monthly and yearly basis. Each type of fruits and vegetables were calculated to number of average eating frequency. Two category of eating frequency of fruits and vegetables (2 2x/ day and < 2x/day) were used based on Pedoman Gizi Seimbang/lndonesian Balanced Diet Guidelines (MOH RI, 2014). For types of fruits were categorized into two categories (seasonal and non-seasonal fruits), while types of vegetables were categorized into five categories (leaf, pod, flower, seed and root vegetables). A 2 x 24 hours' food recall in nonconsecutive days (I-day week day, I-day week end) were used to detemine the amount of fruits and vegetables consumption. Than the data were analyzed using Nutrisurvey 2007 and categorized into good consumption (2 200 gr/day for fruits and 2300 gr/day for vegetables) and less good consumption (< 200 gr/day for fruits and < 300 gr/ day for vegetables) based on Pedoman Gizi Seimbang/lndonesian Balanced Diet Guidelines (MOH RI, 2014). For the availability of fruits and vegetables, a semi-structured questionnaire had been used to assess the availability of fruits and vegetables at school and home. The data processing was done computerized. Descriptive statistic were calculated for respondent characteristics, food pattern and availability of fruits and vegetables.

RESULTS

Characteristics of respondent were described by age, sex and grade. The characterics of respondents are described on Table 1.

Table 1.
Characteristics of Respondents

Variable	Frequency	
	n	%
Age (year)		
15	13	20
16	29	44.62
17	23	35.38
Total	65	100
Sex		
Boy	20	30.77
Girl	45	69.23
Total	65	100
Class Grade		
X	31	47.69
XI	34	52.31
Total	65	100

The food pattern of fruits is the fruits consumption habits including the frequency, type and amount of fruit eaten each day by one person or a particular group of people. Distribution of food patterns of fruits can be seen Table 2.

Table 2.
Food Pattern of Fruits

Food Pattern	Frequency	
	N	%
Eating Frequency		
Good (≥2x/day)	39	60
Less Good (<2x/day)	26	40
Total	65	100
Types of fruits		
Non-seasonal fruits	58	89.23
Seasonal fruits	7	10.77
Total	65	100
Amount of consumption		
Good (≥ 200 gr/day)	37	59.92
Less Good (<200 gr/day)	28	43.08
Total	65	100

Based on Table 2, the percentage of fruit consumption frequency of respondents who have a good category (60%) and less good category (40%). Type of fruits most consumed by the respondent were non-seasonal fruits group (89.23%). Total consumption of fruits on respondents who have a good category was 56.92% and with less good category was 43.08%.

The food pattern of vegetables is the habit of consuming vegetables including frequency, type and amount of vegetables were eaten every day by one person or a particular group of people. Distribution of food patterns of vegetables can be seen in Table 3.

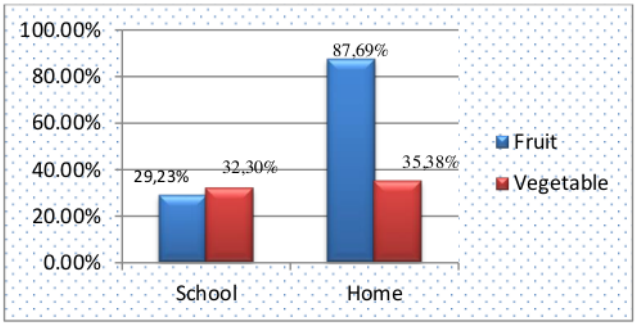
Table 3.
Food Pattern ofVegetables

Food Pattern	Frequency	
	n	%
Eating Frequency		
Good (≥2x/day)	36	55.38
Less Good (<2x/day)	29	44.62
Total	65	100
Types of vegetables		
Leaf vegetables	36	55.39
Pod vegetables	13	19.99
Flower vegetables	9	13.84
Seed vegetables	7	10.75
Root vegetables	5	7.69
Total	65	100
Amount of consumption		
Good (≥ 200 gr/day)	38	58.46
Less Good (<200 gr/day)	27	41.54
Total	65	100

Based on Table 3, the eating frequency of vegetables consumption among respondents who have good category was 55.38% and less category was about 44.62%. Types of vegetables that often consumed by the respondents was leaf vegetables group (55.39%). Amount of consumption of vegetables among respondents who have good category was 58.46% and abot 41.54% with less good category.

The availability of fruits and vegetables are the stat fruit and vegetable availability of production include:the availability of vegetables in schools and the availability of vegetables at home that may affect the level of consumption of the respondents.

Figure 1.
Availability of Fruits and Vegetables



As Figure 1 describe that the availability of vegetables in schools was as much as 29.23% and 87.69% at home. While the availability of fruit in schools was as much as 32.30% and 35.38% at home.

DISCUSSION

Based on the survey results revealed that the percentage of respondents with eating frequency of fruits 2 times a day (60%) were greater than eating frequency < 2 times a day (40%). Half of respondent (56,92%) consumed fruits 2 300 g/day and the rest of them (43.08%) consumed fruit <300 g/day. The problem of less consumption of fruits were also found in high school students in United States whereas more three fourth students ate unsufficient fruits and vegetables (Lowry et al, 2008). This probably occur due to lack of knowledge and motivation regarding the important of consuming fruits.

The type of fruit that often consumed by the respondent was non-seasonal fruits (89.23%) such as oranges, apples and bananas. The majority of respondents frequently consumed fruit were often provided by the respondents' parents in the home. Seasonal fruit type is not a type of fruit that is easily obtained. This study is also consistent with research conducted by Dewi Mulyani (2010), Gustipra (2012) and Farisa (2012) that most teens were loved nonseasonally fruit group.

Based on the Ministry of Health (2014) good vegetable consumption frequency is ≥ 2 times a day and consume vegetables minimum 2 times a day. Based on the survey results revealed that the percentage of eating frequency of vegetable consumption among the respondents was ≥ 2 times a day (55.38%) greater than eating frequency <2 times a day (44.62%). This finding was different from the results of research conducted by Gustiara (2012) among the students of SMAN 1 Pekanbaru in which eating frequency of vegetables <2 times a day (64.6%) is greater than consume vegetables 2 2 times a day (35.4%). This fact was influenced that some students bring lunch to their school that has been provided by the parents which contain vegetables.

Type of vegetables that often consumed by the respondents was leaf vegetable group (55.39%). This finding is in line with research conducted by Gustiara (2012) obtaining results that type of vegetables commonly consumed by the respondent was group of leaf vegetables and root vegetables. This is because these types of vegetables more easily available and relatively cheap price (economic). Total consumption of vegetables among respondents 2300 gr/day (58.46%) bigger than respondents who consumed vegetables <300 g/day (41.54%). This is consistent with research conducted by Setiowati

(2010) in SMAN 1 Bogor (58.67%) and SMAN Pamekasan. (63.17%) that the number of respondents with vegetable consumption was still less than 300 gr/day. This of course shows that the behavior of vegetable consumption in adolescents is still in the category of low consumption level of less than 3-4 servings of fruit per day as recommended by the WHO (MOH RI, 2014). There is still a lack of consumption of vegetables on the respondent due to the schedule of school until the afternoon so that the respondents more often consume snacks in schools in general contain less vegetables, resulting in a low intake of vegetables on respondent.

Availability of fruit in schools was considered low, as many as 32.30%. This could be seen based on observation in school canteens every day that they only sold processed fruit such as banana chocolate. On the other hand, the availability of fruit at home was still considered low at only 35.38%. Based on the survey results revealed that the availability of vegetables in schools was lower, as much as 29.23%. It could be seen from the availability of school canteen that only sells food such as rice cake contained "lontong pecal" (local food contain rice cake and vegetables with peanut sauce). The availability of vegetable at home was high at 87.69%, since most foods containing vegetable had been provided by the parents of respondents. This study result was also consistent with research conducted by Farisa (2012) about the availability of fruits and vegetables at school and home on high school students showed that the availability of fruits and vegetables at home was higher than in schools. The attitude and behavior of parents towards the consumption of vegetables and fruits will be positively correlated with children's eating behavior in consuming vegetables and fruit. Children who consume vegetables and fruit in a good amount when the parents also eat fruit and vegetables. This was due to the parents' behavior in consuming vegetables and fruit aka encourage their children to do the same (Pearson et al, 2009).

CONCLUSSION

This study concluded that the most consumed fruits were the kind of seasonal fruit by more than 300gr / day with the eating frequency of fruits was more than 2 times a day. On the other hand, the most consumed vegetable among respondents were leaf vegetables of more than 300gr / day with eating frequency was more than 2 times a day. Respondents noted the availability of vegetables at home was higher than vegetable availability in school. Meanwhile, the availability of fruit at home and school was not too much different.

ACKNOWLEDGMENT

Our deepest gratitude to all of the respondents involving in this study, the students of SMAN 8 Pekanbaru. We also would like to thank the headmaster of SMAN 8 Pekanbaru for making this study possible and to the teachers for their cooperation during the study.

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