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Factors Related to Fruit Vegetable Consumption of Adolescent in Rural and Urban Areas

Adhila Fayasari*, Chika Meidina, Tri Sari Wijayanti
Faculty Of Public Health, Universitas Binawan, Jakarta, Indonesia
* adhila@binawan.ac.id

ABSTRACT
Vegetables and fruit consumption contain many benefits. Even though, in Indonesia consumption of vegetables and fruit still less than a recommendation, especially in adolescent. The purpose of this re-search is to identify the factors affecting the consumption of fruit vegetables consumption (FV) adoles-cents in urban area (Jakarta) and Rural (Bogor). This research used cross-sectional design and random sampling in 213 junior high school student in Jakarta and Bogor from January- Februari 2020. Knowledge, self-efficacy, parental influence and availability fruit vegetable were collected by self-questionnaire, and consumption of fruit and vegetable were collected by SQ-FFQ. Data were analysed using chi-square test. The result of this study indicated that adolescents who consumed vegetables and fruit according to recommendations per day are 24.3% and 13,2%, in urban and rural, repectively. There were significant relationship between self - efficacy (p 0.034; OR 2,61), availability vegetables and fruit (p 0.048; OR 0,41), parental influence (p 0.032; OR 2,95), in urban but, there was no significant relationship between all factors to FV consumption.

Keywords : Adolescent, Fruit vegetable consumption, Knowledge, Parental Influence, Self-Efficacy

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BACKGROUND

Vegetables and fruits are food groups widely consumed by people for their numerous benefits. Our body does not only need protein and calories, but also vitamins and minerals contained in vegetables and fruits (Raharto *et al*, 2008). Fruits and veg tables are known as the source of vitamin C, especially oranges, pineapples, tomatoes, while carrots have carotenoid pigment known as the source of pro-vitamin A (Pardede, 2013). Consuming adequate amount of vegetables and fruits can reduce the risk of overweight or obesity. Fiber contained in vegetables and fruits can prevent constipation and make us full longer. Another function of fiber is reducing cholesterol (Wirakusumah, 2007).

The prevalence of overweight or obesity in children and adolescence aged 5-19 years-old has greatly increased from 4% in 1975 to ≥18% in 2016. Overweight and obesity is associated with the cause of mortality around the globe compared to malnutrition. The increasing weight is the main risk factor for non-contagious diseases such as: cardiovascular diseases (particularly heart diseases and stroke) which is the main cause of fatality in 2012, diabetes, several types of cancer (including endometrium, breast cancer, ovarian, prostate, liver, gall bladder, kidney, and large intestine) (WHO, 2018). . According to AKG 2013, the recommended amount of fiber consumption for adolescence aged 10-18 years old is 30-35 grams per day (Kementerian Kesehatan, 2013). WHO (World Health Organization) recommends to consume vegetables and fruits as many as 400 grams or 5 servings per day, consisting of 250 grams of vegetables and 150 grams of fruits. The General Guidance of Balance Nutrition (PUGS) suggests that individual should consume vegetables at least 3-4 servings per day and fruits at least 2-3 servings per day (WHO 2003).

Based on the data provided by Eurostat Statistic, as many as 65.7% population in European Union consumes 1-4 servings of vegetables and fruits per day in average (Eurostat, 2014) . In US, people averagely consume 444,3 grams of vegetables and fruits per individual per capita in a day, while in Asia especially in Malaysia, 312 gram. The data shows that the average vegetables and fruits intake in US and Asia has not been already in accordance with the recommendation (Dhandevi and Rajesh, 2015). The data of Basic Health Research revealed that 93.5% people aged >10 years old consumed vegetables and fruits below the recommended amount of 400 grams per capita per day. This figure increased in 2018 into 96.8% of people age 10-14 years old (Balitbangkes, 2013a; Balitbangkes, 2018). By 2016, vegetables and fruits intake remained less than half amount of the recommendation. Most of Indonesian consumes vegetables and fruits as many as 173 grams per day. Fruits intake is less than vegetables intake which is 67 grams, while vegetables is 107 grams per capita per day (Ridwan, 2017).

A number of research has been conducted to identify the factors affecting low consumption of vegetables and fruits. The characteristic factors affecting vegetables and fruits consumption are: age, sex, and parents' financial level (Balitbangkes, 2013b; Lestari, 2012). The lower education background, the lower vegetables and fruits consumption. Moreover, adolescence is the transition period of diet changes from affected by household to individual diet habit (Farida, 2010). This factor is related to knowledge, preference, and self-efficacy that affect vegetables and fruits consumption in adolescence (Anggraeni and Sudiarta,2018) . In that research, 59.6% adolescence has poor knowledge and self-efficacy factor in adolescence of 53.4% who has low self-efficacy on vegetables and fruits. Other factor is parents and availability of vegetables and fruits in their house also affecting the consumption of vegetables and fruits in adolescence (Wirahmah, 2016). The results of the

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research suggest that vegetables and fruits consumption is positively related to parents and availability of vegetables and fruits (p-value < 0.05).

Some previous studies on the factors affecting vegetables and fruits consumption in adolescence show that there is a significant relationship among knowledge, availability of food, media exposure, parents' opinion (Rachman *et al* 2017). Regarding the availability of vegetables and fruits, it is different from rural to urban area. A research conducted in Yogyakarta shows that vegetables and fruits consumption in rural is higher than in urban areas (Oktavia, *et al*, 2019). Based on the description above, the researcher is interested to identify the factors affecting vegetables and fruits consumption in adolescence in Jakarta as an urban area and Bogor as a rural area."

METHOD

This research used cross-sectional design conducted at Public Junior High School 238 Jakarta and Public Junior High School 2 Cileungsi Bogor from January to February 2020. The research subjects were all junior high school students grade VII. VIII, and IX. The subjects were taken using systematic random sampling based on the total of the class divided into 18 groups of class with the sample of 3 classes representing grade VII, VIII, and IX and the total sample was 107 students for each school. This research had been approved by Health Research Ethic Committee University of Pembangunan Nasional "Veteran" Jakarta (UPNVJ), B/2227/XII/2019/KEPK.

Characteristics of subject was measured using questionnaire on age, sex, financial level of parents, and nutritional status. Nutritional status was converted from the formulation of weight and height. Weight was measured using GEA weight scale with the capacity of 120 Kg and accuracy of 0.1 Kg, while the height was measured using GEA microtoise with the capacity of scale 2 meters and accuracy of 0.1cm performed by Diploma 3 students of nutrition department. The results of formulation from nutritional status was then categorized using z-score in accordance with WHO Standard 2005.

Vegetables and fruits consumption was assessed using SQ-FFQ (Semi-Quantitative Questionnaire) containing 30 items of vegetable and fruit. Vegetables and fruits consumption was categorized as good if the consumption of the respondent was ≥400 grams per day (WHO, 2018). Data regarding level of knowledge, self-efficacy, availability of vegetables and fruits, as well as parental influence were taken through questionnaire. Validity and reliability of questionnaire in this research was conducted on junior high school students. After validity testing, it was obtained that from 31 items, all questionnaire items were valid with r correlation 1.956, while the reliability test obtained an alpha Cronbach of 0.617, meaning that the questionnaire was fairly reliable.

The questionnaire items on level of knowledge, self-efficacy, availability of vegetables and fruits, as well as parents' influence were obtained from the modification of the research conducted in Jakarta (Anggraeni and Sudiarta, 2018). The level of knowledge consisted of 15 items categorized into two categories. If the respondents answered correct, they got 1 point, so the total score was 15. Poor knowledge was assessed from the total score <60% and good knowledge is the total was ≥ 60% (Arikunto, 2006).

The self-efficacy, availability of vegetables and fruits, as well as parents' influence consisted of 6 items with 4 multiple choices for each item. The variable of self-efficacy variable was categorized into 2 which was high and low with the maximum score of 24. The variable of availability of vegetables and fruits was categorized into 2 which is high and low ith a maximum score of 16. The items number 5-6 were not counted, as it was used to identify the access of the respondent to vegetables and fruits. The parents'

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influence variable was categorized into 2, which was high and low with the maximum score of 24. The self-efficacy was identified as high if the total score of availability of vegetables and fruits was ≥ mean and it was called low self-efficacy if the total score was <mean.

The data analysis included univariate, and bivariate analyses. The description of variable frequency distribution was obtained based on the results of univariate analysis. The association the dependent variable and the independent variable was obtained based on bivariate analysis with the confidence level of p-value = 0.05, which was tested with a statistical program using the chi-square test.

RESULTS

This research was conducted from January to February 2020. The data was taken from 106 students of Public Junior High School Cileungsi and 107 students of Public Junior High School 238 Jakarta. Based on Table 1, the characteristics of subjects in urban area are dominated by female students, while in rural areas the number of male and female students is the same. The age of the subjects ranges from 10-16, as the subjects are junior high school students. The nutritional status in urban area is dominated by normal nutritional status. Meanwhile in rural area, the proportion of fat is higher (9.4%) than the proportion of nutritional status of fat in urban area (2.8%). Table 2 shows an overview of the proportion of the variables of consumption factors and consumption of fruits and vegetables in adolescents. Overall, in term of knowledge, urban adolescents are more likely to have good knowledge than rural adolescents, where 70.8% of them have poor knowledge of fruits and vegetables consumption.

Table 1. Characteristic Subjects

Variable	Urban		Rural	
	n	%	n	%
Sex				
Male	38	35,5	53	50,0
Female	69	64,5	53	50,0
Age				
10-12 years	14	13,1	36	34,0
13-16 years	93	86,9	70	66,0
Nutrition Status				
Underweight	1	0,9	1	0,9
Normal	103	96,3	95	89.6
Overweight	3	2,8	10	9,4
Family income				
Low (< Rp 2.000.000,-)	44	41,1	27	25,5
Moderate (Rp 2.000.000,- - Rp 4.000.000,-)	43	40,2	48	45,3
High (>Rp 4.000.000,-)	20	18,7	31	29,2

Self-efficacy in this case is dominated by poor self-efficacy in both groups, yet the percentage of urban adolescents is higher (71%). The availability of fruits and vegetables in both groups is high (58.9% and 68.9%), but it is higher in rural group. The high parental influence is higher in the urban group than in the rural group. Less vegetable consumption

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is dominated by the two groups, and they have the almost the same amount of fruits consumption. Fruits and vegetables consumption less than the recommended amount (≤ 5 servings per day) is higher in the rural group than in the urban group (75.7% and 86.8%, respectively) (Table 2).

Table 2. Frequency of fruit and vegetable consumption factors

Variable	Urban		Rural	
	n	%	n	%
Knowledge				
High	61	57,0	31	29,2
Low	46	43,0	75	70,8
Self-efficacy				
High	39	36,4	87	82,1
Low	68	63,3	19	17,9
Availability of fruits and vegetables				
High	63	58,9	72	67,9
Low	44	41,1	34	32,1
Parental influence				
High	63	58,9	89	84,0
Low	44	41,1	17	16,0
Vegetable consumption				
High	9	8,4	8	7,5
Low	98	91,6	98	92,5
Fruit consumption				
High	34	31,8	40	37,7
Low	73	68,2	66	62,3
Fruit vegetable consumption				
High	26	24,3	14	13,2
Low	81	75,7	92	86,8

Table 3 illustrates the relationship between the factors affecting vegetables and fruits consumption in rural and urban adolescents. Consumption of fruits and vegetables in the urban group is influenced by self-efficacy, availability of fruits and vegetables, the parental influence, while in the rural group, there is no factor influencing fruits and vegetables consumption. In the urban group, the relationship between the availability of fruits and vegetables and its consumption has a negative direction that those with less availability of fruits and vegetables tend to consume a good amount of fruits and vegetables than those with good availability.

Table 3. Factors related to fruit and vegetables consumtion in rural and urban area

Variable	Fruit Vegetable Consumption						p-value	OR
	High		Low		Total			
	n	%	n	%	n	%		
Urban								
Knowledge							0,936	-
High	15	24,6	46	75,4	61	100		
Low	11	23,9	35	76,1	46	100		

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Self-efficacy							0,034*	2,61
High	14	35,9	25	64,1	39	100		
Low	12	17,6	56	82,4	68	100		
Availability of fruits and vegetables							0,048*	0,41
High	11	17,5	52	82,5	63	100		
Low	15	34,1	29	65,9	44	100		
Parental influence							0,032*	2,95
High	20	31,7	43	68,3	63	100		
Low	6	13,6	38	86,4	44	100		
Rural								
Knowledge							1,000	-
High	4	13,2	27	87,1	31	100		
Low	10	13,3	65	86,7	75	100		
Self-efficacy							1,000	-
High	12	13,8	75	86,2	87	100		
Low	2	10,5	17	89,5	19	100		
Availability of fruits and vegetables							0,123	-
High	7	9,7	65	90,3	72	100		
Low	7	20,6	27	75,7	34	100		
Parental influence							1,000	-
High	12	13,5	77	86,5	89	100		
Low	2	11,8	15	88,2	17	100		

Note : *p<0,05

Based on Table 4, it can be seen that the confidence to consume vegetables and fruits is higher in the rural group, that more than 90% stated that fruits and vegetables intake is not a big deal. The confidence to consume fruits and vegetables every day in the urban group only reaches 67% for fruits and 49% for vegetables. Vegetables consumption tends to be more seldom than fruits in both groups. The point on habit of consuming fruits and vegetables is higher in the rural group.

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Table 4. Item Analysis of Self-Efficacy Questionnaire

Item	Urban	Rural
Consuming fruit every day is difficult		
Agree	22 (21,6)	8 (7,7)
Dissagree	80 (78,4)	96 (92,3)
I believe I can eat fruit every day		
Agree	67 (65,7)	83 (80,8)
Dissagree	35 (34,3)	21 (20,2)
Eating fruit every day is my habit		
Agree	38 (37,2)	67 (64,4)
Dissagree	64 (62,8)	37 (35,6)
Consuming vegetable every day is difficult		
Agree	36 (35,3)	8 (7,7)
Dissagree	66 (64,7)	96 (92,3)
I believe I can eat vegetable every day		
Agree	49 (48,0)	78 (75,0)
Dissagree	53 (52,0)	26 (25,0)
Eating vegetable every day is my habit		
Agree	40 (39,3)	63 (60,6)
Dissagree	62 (60,7)	41 (39,4)

DISCUSSION

The characteristics of the subjects in this study, both in urban and rural areas, are likely to be dominated by normal nutritional status. Meanwhile, in rural area, the proportion of fat is higher (9.4%) than the proportion of overweight nutritional status in urban area (2.8%). Overall, in terms of knowledge on fruits and vegetable consumption, the proportion of subjects who have good knowledge is higher in urban adolescents than rural adolescents. As many as 70.8% of rural adolescents are dominated by those who have poor knowledge on fruits and vegetables consumption.

The factors under study include knowledge, self-efficacy, availability of fruits and vegetables, and parents' influence. Self-efficacy in this case is dominated by poor self-efficacy in both groups, but the urban group has higher percentage (71 %). The availability of fruits and vegetables in both groups is good (>50%) (58.9% and 68.9%), but it is higher in the rural group. The good parental influence in consuming vegetables and fruits is higher in the urban group than in the rural group.

Self-efficacy refers to overall one's belief in the ability to face challenges. Self-efficacy affects the independence of an individual. People who have high self-efficacy will be more confidence in their abilities needed for themselves to face various forms and levels of challenge (Bandura, 1997). Low self-efficacy is associated with lack of information about the ability of individuals to believe in themselves in carrying out the task or knowledge given to them (Adicondro, 2011).

From several factors influencing the consumption of fruits and vegetables, the self-efficacy, parents' influence and the availability of fruits and vegetables are better in the rural group, while the urban group has better knowledge. It is related to the access to information, in which the urban population is familiar with gadget, while in the rural group, only a few of the students have gadget. Based on the observation, most junior high school students in rural area do not have mobile phones.

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This research shows that the average fiber consumption of the subjects in urban area is 2.66 g/day, while in rural areas it is slightly higher, 2.99 g/day. There is no significant difference in these results, but it can be said that the average fiber consumption of the respondents is far below low from the recommended amount. According to the RDA 2013, the recommended fiber consumption for adolescents aged 10-18 years old is 30-35 grams per day (Kemenkes, 2013).

WHO (World Health Organization) recommended consuming 400 grams of vegetables and fruits or 5 servings per day, consisting of 250 grams of vegetables and 150 grams of fruits4. In Indonesia, only 3.2% of the population aged 10-14 years old consume vegetables and fruits in ≥5 servings per day (WHO, 2018). In the Special Region of Jakarta, only 2.5% of the population aged 10-14 consume vegetables and fruits in ≥5 servings per day (Balitbangkes, 2013). The results of this study indicate that the consumption of fruits and vegetables is still in the low category of 90% and 60% both in rural and urban groups.

There is a significant relationship among self-efficacy, availability of fruits and vegetables, parents' influence and consumption of vegetables in the urban group, but it is not significant in the rural group. Meanwhile, in the rural group, there is no significant relationship among self-efficacy, availability of fruits and vegetables, parents' influence and consumption of fruits and vegetables ($p > 0.05$). In this research, there was a relationship between self-efficacy and consumption of fruits and vegetables ($p < 0.05$), with odd ratio of 2.41 which means that the better the self-efficacy, the consumption of fruits and vegetables increases as many as 2.14 times. Self-efficacy is the most influential factor and consistently associated with high consumption of fruits and vegetables (Contento *et al*, 2002; Van Duyn *et al*, 2001)

Perceptions of self-efficacy depend on the confidence in the ability to control challenges and self-function. This self-regulatory cognitive ability determines whether a habit will be practiced, how much effort is put into it and how long it will take to accomplish and face challenges and failures. Self-efficacy provides the achievement of goals because it is the first step of planning and performing behavior of individuals15. Poor consumption of vegetables and fruits means that there is no self-efficacy for adolescents to consume vegetables and fruits for certain reasons (Widianto, 2017)

Self-efficacy is measured using questionnaire containing 6 statements. Based on the statement analysis, it is found that 90% of the subjects said that fruits and vegetables consumption is not a big deal. The confidence to consume it every day in the urban group only reaches 67% for fruits and 49% for vegetables. The two groups show lower self-efficacy on vegetable consumption than fruits consumption. The point on habit of consuming fruits and vegetables is higher in the rural group. Self-efficacy can be improved through verbal persuasion (educators, teachers, etc.) by conveying information about improving good habits (Bandura, 1997)

The availability of vegetables and fruits has a significant relationship with the consumption of vegetables and fruits in adolescents. A research conducted in Depok shows that the good consumption of vegetables and fruits is higher in adolescents with better availability of vegetables and fruits at home (Farisa, 2012). It is in line with the research conducted in Semarang that children whose availability of vegetables and fruits is negative have a risk of consuming less vegetables and fruits, which is 2.2 times higher than those with positive availability of fruits and vegetables (Putra, 2016).

The availability of vegetables and fruits at home in a week is uncertain, only 7-11% of families provide it more than 3 times a week. The parents cannot be said to always

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provide it in a week. Access to purchase of fruits and vegetables close to home is only between 20-40%, and the urban group has a better access to purchase of fruits and vegetables than the rural group. It is related to the density of the number of stalls/outlets that provide healthy food in urban areas, which is more than in rural areas (Ollberding *et al*, 2012). Rural areas are also famous for producing fruits and vegetables, but most of the production is distributed to urban areas, so that families living in rural areas cannot consume this commodity.

The role of parents is very important in the family. Diet habit of the family members is closely related to their parents. In Asian countries, factors that influence the consumption of fruits and vegetables are less protective and sedentary lifestyle. Some protective factors include peer support at school, supervision by parents, relationships with parents and parental bonding. In addition, there is another factor such as health promotion in supportive environment at schools (Peltszer and Pengpid, 2012).

In this research, the questions about parents' influence contained in the questionnaire consisted of the frequency of consumption, parents reminding, and parents' support to consume fruits and vegetables. In terms of type, fruits consumption is recommended by parents more than vegetables consumption, yet the difference is small. In the urban group, parents tend to provide more influence on fruits and vegetables consumption.

On average, children consume vegetables and fruits because their family members or their parents consume it (Krolnes *et al,* 2011). There was a significant relationship between parents' habit on vegetables and fruits consumption in adolescents, therefore the role of parents is very important in healthy diet habit in adolescents (Nurlidyawati, 2015). In a study conducted in South Jakarta, adolescents with less parental influence' habits are less likely to consume vegetables and fruits (Lestari, 2012).

CONCLUSION

Fruits and vegetables consumption is less dominated by rural group than the urban group, and it is almost the same within both groups in terms of fruit consumption. The nutritional status in urban area is dominated by normal nutritional status. There is no relationship between the level of knowledge on vegetables and fruits consumption among junior high school students in rural area (Bogor) and urban area (Jakarta). There is no relationship between self-efficacy on vegetables and fruits consumption among junior high school students in rural area (Bogor) and urban area (Jakarta). There is a relationship between the availability of vegetables and fruits and its consumption among junior high school students in rural area (Bogor), but not in the urban group. There is a relationship between the parents' influence on vegetables and fruits consumption among urban adolescents, but not in the rural adolescents group.

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