13. Correlation of Food Literacy and Nutritional Status Among Adolescent Girls in Central Java Indonesia

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Correlation of Food Literacy and Nutritional Status Among Adolescent Girls in Central Java Indonesia

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Abstract. Adolescent girls in developing countries are vulnerable groups in term of nutritional status, including Indonesia. One in every seven of adolescents in Indonesia was being overweight or obese, according to the Indonesian Basic Health Survey in 2018. Food literacy as individual factor held the important role on lifestyle and behavior development related to food intake and choice, hence are leading to nutritional status. Aim of this research was to assess the correlation between food literacy and nutritional status among adolescent girls in Central Java. This observational research involved 388 adolescent girls from 3 districts in Central Java, i.e., Banyumas, Purbalingga, and Kebumen Districts. Food literacy was assessed by 26 questions related to food and nutritional knowledge. Nutritional status was measured by body mass index (BMI). Data was analyzed by using logistic regression. Ethical clearance was approved by Medical Faculty Ethics Committee, Jenderal Soedirman University. Study showed that about one third of adolescent girls (34,4%) were obese, overweight, and underweight, while approximately half of adolescent girls (65,7%) had normal BMI. It was significantly proved that adolescent girls with good food literacy have 2,8 times higher possibility to have normal BMI compared to adolescent girls with poor food literacy. Study suggests that it is essential to increase the food literacy in order to improve nutritional status among adolescents' girls using local channel exist close to them such as organization in school.

INTRODUCTION

Adolescents are essential state on development of nutritional status due to their eating pattern and food choice which can lead to their adverse health impact. Moreover, they are prone to inappropriate eating habit. It was reported Asian adolescents reported have lower home healthy food availability [1]. In Southeast Asia region, a large number of adolescents endure from malnutrition status and anemia, which impacts their health status and development. The high rate of malnutrition in adolescent girls are not only significantly contributes to expanded morbidity and mortality related with pregnancy, but moreover to increased risk of delivering low birth-weight babies [2]. The raising challenge in adolescent girls is related to multiple form of malnutrition in the last three decades. It refers to the coexistence of over nutrition (overweight and obesity) and under nutrition (underweight, wasting, stunting and micronutrient deficiencies) [3]. The prevalent of these nutrition problems among adolescents are increased in developing countries. Based on the Global School-Based Health Survey (GSHS) between 2009 and 2016, it revealed the prevalence of those problems in South Asia overweight was 10.8%, thinness was 10,8%, and stunting was 13 % [3]. Undernutrition,

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defined as BMI <5th percentile of NCHS reference values, was highly prevalent in three of the 11 studies of ICRW: 53% in India, 36% in Nepal and 23% in Benin [4]. In Indonesia, one in seven of adolescents in were being overweight or obese, according to the 2018 national Basic Health Research Survey [5]. Assessing status of adolescents' nutrition is better done by anthropometry, as well as at other stages of the life cycle. The anthropometry has some advantages which are inexpensive, non-invasive, and universally applicable method of assessing body composition, size and proportions [6]. It also has the ability to measure the complexity of changes in body composition during adolescence, particularly during the puberty-related growth spurt which varies in its timing, assessment of obesity, or undernutrition. Anthropometric assessment can be used to investigate nutritional status include the measurement status of physiology of the body based on its height and weight. Body mass index (BMI) is the most famous and common method for nutritional status assessment. BMI is uncomplicated in terms of calculation; however, it does have certain flaws: primarily, it does not provide any information on body mass composition (body fat, muscle tissue, and water content). Therefore, a result showing overweight or obesity in individuals with highly developed musculature is often incorrect [7].

Nutritional problems among adolescence were associated with several determinants, including sociodemographic factors such as gender, education, parental behavior. It's also related to the intake of energy and nutrients, food choices and consumption behavior, physical activity, smoking, and genetic factors [8]. Behavior factors related to food consumption found to be increasing factors related to nutritional status such us overweight. Adolescents where defines as the transition between puberty and adulthood, revealed as a rising period of independent decision making that influence to health-related behaviors [9]. Food literacy as individual factor predicted has important role on developing lifestyle and behavior related to food intake and choice which will lead to nutritional status [10].

Food literacy defines as 'the capacity of an individual to obtain, process and understand basic information about food and nutrition as well as the competence to use that information in order to make appropriate health decisions' [11]. Food literacy concept develop upon the art has been done surround the relationship between food knowledge and food choices. It offers an integrative framework for assessing and understanding the factors shaping food intake and dietary patterns at an individual level [10]. This study aims to assess the correlation between food literacy and nutritional status among adolescent girls in Central Java, Indonesia.

MATERIAL AND METHODS

This study was observational research, using cross-sectional design. It involved 388 adolescent girls aged 15-19 years old from 3 districts in Central Java, i.e., Banyumas, Purbalingga, and Kebumen Districts, which was chosen by multistage random sampling. From every district, the samples were divided into three strata which were public/private high school, vocational high school and Islamic high school. The samples were divided into clusters form every stratum to be chosen proportionally according to the size of every stratum. Data of respondent characteristics and food literacy were collected by administered questionnaire. Food literacy was assessed by 26 questions related to food and nutritional knowledge, then categorized in three groups; poor (<60% of the question was correct, moderate (60% – 75%) and good (>75%) [12]. Nutritional status was measured by body mass index (BMI). Underweight (thinness) among adolescents is defined as less than 2 SDs from median for body mass index (BMI) by age and sex. While moderate and severe underweight are assessed by less than –2 SD BMI, and overweight is measured by more than 1 to 2 SD BMI, and obesity is when more than >2 SD BMI (13). Data of respondents' heights were measured using microtoise and weights were measured using digital body scales. Data was analyzed by using logistic regression. The model made by putting independent variable which is food literacy, all confounders (based on theory and previous research) and dependent variable which is nutritional status into analysis. Ethical clearance was approved by Medical Faculty Ethics Committee, Jenderal Soedirman University.

RESULT AND DISCUSSION

Adolescent girls who participated in this study were high school students from 3 different districts in Central Java. Based on their sociodemographic information most of them are raised by low education parents, which is 47,9% of their father were graduated from elementary school and 51,5% of their mother were also graduated from elementary school. The average income of parents were 1,771,729 rupiah which is less than regional minimum salary (1,798,979 rupiah) [14]. Most of the adolescent girls (90,2%) have smart phone as tools for their interaction and source of information (Table 1).

Slightly less than one fourth of adolescent girls (23,5%) were underweight (thinness), while 5,4 % of them obese and 5,4% overweight. This number was much higher compared to Nasional figure where it was reported 6,8%, 11,2 % and 4,4% of adolescents were underweighted, overweight and obese respectively [5]. This number is almost similar with the number of nutritional problems in developing countries, especially in South Asia. Pakistan showed the rate for overweight was 8%, where Afghanistan presented the highest prevalence across South Asia of overweight (19%), contrasting with a low thinness rate (2.5%). Sri Lanka reported the highest rate for thinness (18.6%), co-existing with relatively high rates overweight (13.2%). The lowest prevalence of thinness in South Asia was found in Bhutan (1.5%) as opposed to overweight prevalence (16.3%) (2). Food literacy of female high school students, a respondent in this study was approximately poor (60,3%).

TABLE 1. Demographic characteristics of Adolescents girls

Demographic Characteristics	n	%
Father's education		
Did not finish elementary school	11	2,8
Elementary school	186	47,9
Junior High School	60	15,5
Senior High School	91	23,5
Higher education (university)	40	10,3
Mothers' education		
Did not finish elementary school	9	2,3
Elementary school	200	51,5
Junior High School	79	20,4
Senior High School	74	19,1
Higher education (university)	26	6,7
Parents income (mean=1,771,729 rupiah)		
High	130	34,2
Low	250	65,8
Cell phone ownership		
Smartphone	350	90,2%
Not smartphone (hand phone without internet connection)	19	4,9%
No cell phone	19	4,9%

TABLE 2. Nutritional Status and Food Literacy among Adolescents Girls

Variables	N= 388	%
Nutritional Status		
Normal	255	65.7
Abnormal (34,3%)		
Under weight	91	23,5
Overweight	21	5,4
Obese	21	5,4
Food Literacy		
Poor	234	60.3
Moderate	118	30.4
Good	36	9.3

It was significantly proved that adolescent girls with good food literacy have 2,8 times higher possibility to have normal BMI compared to adolescent girls with poor food literacy. It is reported that information and knowledge related to food and nutrition is needed to understand and implement basic information to decide the healthy food choices. Young girls' dietary intake adequate to reflects for optimal health. It has been suggested that developing food literacy skills, such as food and nutrition knowledge, may better equip individuals to attain healthier dietary outcomes [17][15][11][9]. Father education and mother education revealed did not significant correlate with nutritional status of adolescents. This finding seems different when comes to children, where some of the studies found that mother education and knowledge correlates to children under five nutritional statuses [16][13].

TABLE 3. The Correlation between Food Literacy and Nutritional Status in Adolescent Girls among other predictors variables

Predictors	Nutritional status				Total		P-value	OR
	Normal		Abnormal					
	n	%	n	%	n	%		
Food Literacy								
Poor	148	63.2%	86	36.8%	234	60,3%	0.684	1.104
Moderate	77	65.3%	41	34.7%	118	30,4%	0.028	2.825
Good*	30	83.3%	6	16.7%	36	9,3%	-	-
Father's education								
No formal education/ never graduated from elementary school*	9	81.8%	2	18.2%	11	2,8%	-	-
Elementary school graduate	120	64.5%	66	35.5%	186	47,9%	0.230	0.370
Junior high school graduate	43	71.7%	17	28.3%	60	15,5%	0.386	0.470
Senior high school graduate	57	62.6%	34	37.4%	91	23,5%	0.194	0.327
University graduate (diploma/ bachelor's degree)	26	65.0%	14	35.0%	40	10,3%	0.344	0.404
Parents' monthly income (IDR)								
Mean	1,771,524		1,772,123		1,771,729		0.577	1.000
(95% C.I.)	(1,556,414-1,986,634)		(1,499,481-2,044,765)		(1,602,963-1,940,495)			
Median	1,000,000		1,200,000		1,000,000			
Minimum-Maximum	0-10,500,000		0-9,500,000		0-10,500,000			
SD	1,726,700		1,571,171		1,673,170			
Cell phone ownership								
Smartphone	226	88.6%	124	93.2%	350	90.2%	0.277	0.529
Not smartphone	14	5.5%	5	3.8%	19	4.9%	0.828	0.845
No cell phone*	15	5.9%	4	3.0%	19	4.9%	-	-

*Reference category

CONCLUSION

Study found that there is positive correlation between food literacy and nutritional status where is girls with good food literacy have 2,8 times higher possibility to have normal BMI compared to adolescent girls with poor food literacy. Study suggests that it is essential to increase the food literacy to improve nutritional status among adolescents' girls using local channel exist close to them such as organization in school.

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