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Relationship between Diet Quality and Nutritional Status among Adolescents

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ABSTRACT

Adolescence is a transition period from childhood to adulthood. According to the World Health Organization (WHO), the limit for adolescents is between 10 - 19 years of age. Nutritional status in adolescents can influence growth and development and continue into adulthood. Low diet quality is one of the direct causes of nutritional status problems in adolescents. Data from the Jambi City Health Service in 2021 shows 280 cases of malnutrition at the junior high school and equivalent level in Jambi City. This research aims to determine the relationship between diet quality and nutritional status in adolescents at junior high schools of SMPN 9 Jambi City. The design used in this research was quantitative research with a cross-sectional approach. This research was carried out at SMPN 9 Jambi City in May 2023. The population and sample in this research were students of SMPN 9 Jambi City, totaling 88 people. The sampling technique was purposive random sampling. The data analysis used was univariate and bivariate. The highest frequency of diet quality was in the poor diet quality category, 52 respondents (59.1%). It can be concluded that a relationship exists between diet quality and nutritional status (p-value ≤ 0.05).

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Introduction

Adolescence is a transition period from childhood to adulthood. According to the World Health Organization (WHO), the limit for adolescents is 10 - 19 years of age. The adolescent transition period is accompanied by developments in other aspects of the adolescent body, both psychological and social. The growth of teenagers of the same age often differs in body size. Nutritional problems that teenagers often experience include nutritional deficiencies (1). During adolescence, many problems negatively impact teenagers' health and nutrition, so the nutritional status of teenagers tends to be malnourished or even obese (2). The prevalence of underweight among adolescents aged 16 - 18 years nationally is 9.4 percent (1.9% are skinny and 7.5% are underweight). A total of 11 provinces are declared high wasting cases according to national prevalence, including Aceh, Riau, South Kalimantan, North Maluku, DKI Jakarta, Central Kalimantan, Banten, South Sumatra, West Nusa Tenggara, Maluku, Papua and East Nusa Tenggara (3). In Jambi Province, there was a decline in 2013 from 12% to 10% in 2018 (Dinas Kesehatan Provinsi Jambi, 2021). Data from the Jambi City Health Service in 2021 shows 280 cases of malnutrition at the junior high school and equivalent level in Jambi City. The highest cases in 2020 - 2021 were at the Talang Banjar Community Health Center, namely 46 cases at the junior high school level and equivalent.

Nutritional status is a measure of body condition seen from the food consumed and the use of nutrients. There are three categories of nutritional status: undernutrition, normal nutrition, and overnutrition (4). Adolescence is a transitional age from childhood to early adulthood, starting from the age of 10 years and ending at 19 years. Adolescence is an important period of growth and development and determines the child's next stage of development (5). In general, problems with nutritional status are caused by high food intake and not balanced with physical activity. The wrong eating habits in teenagers are foods with a food composition high in calories and little fiber (6).

The nutritional status of adolescents can be assessed individually based on data taken from anthropometric examinations in the form of weight and height data, which is then interpreted into a Body Mass Index (BMI). Then, an assessment of the nutritional status of adolescents is carried out by comparing the BMI with anthropometric standards based on the BMI index according to age (BMI/A) (7). Health depends on the level of food consumption. The quality and dishes determine the level of food consumption. The arrangement of dishes must meet the body's needs. Both are quality and quantity (8). Consumption of poor quality will result in unbalanced health and nutritional conditions, resulting in various diseases, including excess nutrition (obesity) and malnutrition (9).

The availability and selection of food ingredients influence diet quality. Diet quality is important for health; balanced nutrition guidelines usually recommend increasing the diversity of foods within food groups and can ensure adequate micronutrients. Diet quality can also be measured based on compliance with balanced nutrition guidelines recommended for health, such as chronic disease prevention and better nutrition (10). Diet quality is also measured based on compliance with balanced nutrition guidelines or recommendations for health, such as preventing chronic disease, assessing diet quality using the diet quality index, fulfilling WHO recommendations, consuming ≥ 400 grams of fruit and vegetables, consuming protein ≥ 10% of total energy, fat consumption < 30% of total energy, fiber consumption ≥ 25 grams (11). If >1x/day is given a score of 50, 2-3x/week is given a score of 25, 1x/week is given a score of 15, 2x/month is given a score of 10 and never is given a score of 0 in each category with these results in categorized as bad if the average value is 15-50 and good if the average value is 0-14 (12). According to Maretha et al., (2020) the use of online food delivery applications, eating behavior can be influenced by several factors, impacting diet quality (13).

SQ-FFQ data is frequency data, namely how many times a day, week, or month people eat certain foods. The SQ-FFQ is generally used to rank people based on nutritional intake but is not designed to estimate absolute intake. This method is more accurate for determining the average nutrient intake if the food menu varies greatly daily. The advantages of this method are that it is relatively cheap and suitable when applied to large group research where daily food intake is very varied, filling forms can be handed over to respondents, and it is easy to distribute (14). Based on the background description above, researchers are interested in conducting research with the aim of finding out the relationship between diet quality and nutritional status in adolescents at SMPN 9 Jambi City.

Methods

The design used in this research was quantitative research with a cross-sectional approach to determine the relationship between diet quality and nutritional status in adolescents in the Talang Banjar Community Health Center, Jambi City working area. This research was conducted at SMP N 9 Jambi City in May 2023. The population in this study was students of junior high school of SMPN 9 Jambi City, totaling 734 people, and the sample used was 88 people.

Diet quality is the independent variable in this study, while nutritional status is the dependent variable. Samples were taken using a purposive random sampling technique from 88 female students at SMPN 9 Jambi City. Research data collection for diet quality variables used the SQ FFQ questionnaire with the interview method. To measure diet quality using the SQ FFQ questionnaire. The data obtained with SQ-FFQ is frequency data, namely how many times a day, week or month people eat certain foods. In general, the SQ-FFQ is used to rank people based on nutritional intake, but is not designed to estimate absolute intake. This method is more accurate for determining the average nutrient intake if the food menu varies greatly from day to day. The advantages of this method are that it is relatively cheap, suitable when applied to large group research where daily food intake is very varied, filling out forms can be handed over to respondents and is easy to distribute (15). Anthropometric data, namely body weight (kg) and height (CM), were obtained from respondents' measurements. The tools used are digital scales and microtoises. Then the z-score calculation is carried out, and the results of the z-score calculation are divided into nutritional categories. Poor nutrition is at Z-score < -3 SD, Malnutrition is at Z-score -3 SD to < -2 SD, Good nutrition is at Z-score -2 SD to +1 SD, Over-weight is at Z-score > +1 SD to +2SD, Obesity is at Z-score > +2 SD. The statistical test used was the Spearman rank test p-value < 0.05.

Results

Table 1 shows that most respondents were male, with a total of 48 respondents (54.5%). The average age of respondents from this study was 13 ± 0.4 years. The average respondent's pocket money is Rp. 15,000, with a minimum value of IDR. 2000 and a maximum of IDR 50,000. Some respondents had high pocket money, 47 respondents (53.4%). However, the pocket money obtained by respondents was not entirely used to buy food or drinks while at school. This pocket money is also used for travel costs to school and buying credit or quota. Half of the respondents' fathers' jobs were entrepreneurs, namely 44

people (50%), while most of the respondents' mothers did not work, namely 70 people (79.5%). Overall, all respondent fathers worked in different types of work. The average father's income is high (60.2%) and the mother's income is low (76.1%).

Table 1. Distribution of respondent characteristics

Respondent Characteristic	n	%
Age (Years Old)		
12	16	18,2
13	58	65.9
14	14	15.9
Gender		
Male	48	54.5
Female	40	45.5
Pin Money		
Low (≤ Rp 12,000)	41	46.6
High (> Rp 12,000)	47	53.4
Father's occupation		
Civil servants/Military/Police	8	9.1
Entrepreneur	44	50.0
Farmer	6	6.8
Others	30	34.1
Mother's occupation		
Civil servants/Military/Police	7	8.0
Entrepreneur	9	10.2
Farmer	2	2.3
Others	70	79.5
Father's income		
Low (≤ Rp 2,972.192)	35	39.8
High (> Rp 2,972,192)	53	60.2
Mother's income		
Low (≤ Rp 2,972,192)	67	76.1
High (> Rp 2,972,192)	21	23.9
Total	**88**	**100.0**

Based on Table 2 it is known that there is a relationship between diet quality and the nutritional status of 88 respondents. Most of the respondents had normal nutritional status (63.6%) with good diet quality (31.8%) and poor diet quality (27.3%), while some respondents had abnormal nutritional status (36.4%) with poor quality diet. (31.8%) had a poor diet, and (9.1%) had a good diet. 52 respondents had poor diet quality (59.1%). This result shows that the respondents in this study had poor diet quality.

Table 2. Relationship between diet quality and nutritional status of adolescents at SMPN 9 Jambi City

Nutritional Status	Diet quality				P - value	R - square
	Bad		Good			
	n	%	n	%		
Not normal	24	27.3	8	9.1	0.022	0.245
normal	28	31.8	28	31.8		
Total	52	59.1	36	40.9		

Discussion

Diet quality can be used as an indicator to measure food intake and eating patterns based on appropriate recommendations and can predict the risk of morbidity and mortality (5). The frequency of

food consumed most frequently in the carbohydrate group is 1-2 times per week, with a total of 155 respondents with food ingredients, such as rice, bread, potatoes, and vermicelli, in the animal and vegetable protein group, it is 2 times per month with a total of 132 for animal protein with ingredients. Foods that are often consumed are chicken, shrimp, and fish, and 114 vegetable proteins with foods that are often consumed are tempeh and tofu, and for vegetables, it is once a day with a total of 124 with foods that are often consumed are leaves cassava, carrots, kale and spinach, and fruit 1 – 2 times per week with a yield of 122 with the foods most consumed being oranges, mangoes, and watermelon. A lack of several nutrients in the adequate category causes low diet quality. Adolescents are known to have low fruit and vegetable intake (14). Adolescent eating habits are an individual's way of consuming available food and are influenced by local social and cultural factors. Most teenagers have the habit of consuming fast food and fried food (16).

Based on Table 2, it is known that there is a relationship between diet quality and the nutritional status of 88 respondents. Most of the respondents had normal nutritional status (63.6%) with good diet quality (31.8%) and poor diet quality (27.3%), while some respondents had abnormal nutritional status (36.4%) with poor quality diet. (31.8%) had a poor diet, and (9.1%) had a good diet. The abnormal nutritional status of having a good quality diet, as many as 8 respondents, probably occurs due to good eating patterns in teenagers, such as choosing healthy food ingredients and supported by good socio-economic conditions (Restutiwati *et al,* 2019). Meanwhile, with normal nutritional status, 28 respondents saw poor diet quality, possibly due to a lack of nutritional knowledge, such as choosing unhealthy foods and supported by poor social and economic conditions (17). Based on statistical tests using the Spearman rank test, a p-value of 0.022 > 0.05 was obtained; this shows a relationship between diet quality and nutritional status. There is a relationship between diet quality and the nutritional status of teenagers at SMPN 9 Jambi City because diet is a factor that is directly related to nutritional status. Diet can be assessed in several ways, including by assessing the frequency of use of food ingredients and nutritional intake. The frequency of use of food ingredients is more likely to be the choice of food ingredients to be consumed daily, while nutritional intake is a direct result of the activity of choosing food to consume. Nutritional status is determined based on nutritional consumption and the body's ability to use these nutrients. The surrounding environment greatly influences teenage eating patterns. Teenagers prefer foods with high sodium and fat content but low in vitamins and minerals (18).

Conclusion

Based on the research results, it can be concluded that about 52 respondents (59.1%) had a poor diet quality category. Meanwhile, some respondents had normal nutritional status, 56 respondents (63.6%). And there is a relationship between diet quality and nutritional status in adolescents at SMPN 9 Jambi City with a p value of 0.022. This research can be used to increase insight and can be used as a consideration for conducting research on diet quality and malnutrition status in adolescents with different research designs

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