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The Relationship of Nutrition Knowledge, Eating Habits, Stress, and The Role of Parents on the Incidence of Overnutrition in Adolescents at Al-Azhar 1 Islamic High School Jakarta

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ABSTRACT

In 2018, 9.5% of adolescents aged 16-18 were overweight, and 4% were obese. The results of a preliminary study conducted at Al-Azhar 1 Islamic High School found that students had an overweight status of 16.1% and obesity of 6.5%, which is higher than the national percentage. This study aimed to determine the relationship between nutritional knowledge, eating habits, stress, and the role of parents in the incidence of overnutrition in adolescents at Al-Azhar 1 Islamic High School Jakarta. This study used a cross-sectional design conducted on 245 class X and XI students. Nutritional knowledge data was obtained by filling out questionnaires independently. Data on eating habits by filling out AFHC questionnaire, stress data by PSS, and parental role data by FHC-NU and FHC-PA. The proportion of students with overnutrition is 20%, and obesity is 18.4%. The results showed a significant relationship between the incidence of overnutrition and eating habits (p=0.000) and stress levels (p=0.022). However, there was no significant relationship between the incidence of overnutrition and nutritional knowledge (p=0.437) and the role of parents (p=0.724). Adolescents need to pay attention to eating habits, control stress levels, consume nutritious food, and maintain a normal weight to prevent the risk of overnutrition.

Keywords : Eating Habits, Nutrition Knowledge, Overnutrition, Stress, The Role of Parents.

INTRODUCTION

Overnutrition, such as overweight and obesity, is a condition with excessive fat accumulation in the fatty tissue under the skin and other parts of the body that may impair health (WHO, 2021). Excess nutrition is a severe problem in adolescents because it will continue into adulthood. In addition, it can increase the risk of non-communicable diseases (NCD) and health problems such as low back pain, sleep apnea, and osteoarthritis (Kemenkes RI, 2018).

According to WHO, the prevalence of children and adolescents aged 5-19 years experiencing overweight and obesity in 2016 was 18%. In Indonesia in 2013, 5.7% of adolescents aged 16-18 experienced excess nutrition, and 1.6% were obese (RISKESDAS, 2013). In 2018 the prevalence increased; 9.5% were overweight, and 4% were obese. In DKI Jakarta Province, the prevalence of overnutrition is 15.14%, and obesity is 10.01%. South Jakarta has the most adolescents experiencing excess nutrition in DKI Jakarta Province, 14.52%. Then, obesity is 7.32% (National Institute of Health and Development, 2019).

Poor eating habits, such as high-calories and high-fat food, are risk factors for overweight and obesity. Increased fast food and chocolates or sweets intake was associated with adolescent obesity (Grace et al., 2021). Research by Mousa *et al.* (2021) also stated that 87.9% of teenagers have unhealthy eating habits. In addition, research by Kurniawati et al. (2019) shows that 31.1% of adolescents are overeating and that eating habits and weight are related. Moreover, another factor that can affect excess nutrition is nutritional knowledge.

Knowledge is the factor for determining one's decisions and actions (Siregar, 2020). Research by Sineke *et al.* (2019) stated that 50% of adolescent respondents had insufficient nutrition knowledge and demonstrated a strong relationship between nutritional knowledge and the incidence of being overweight. The results are the same as in research by Putri (2019), which states that as many as 51.5% of adolescents have poor nutritional knowledge. Another factor that can influence overnutrition is stress.

Based on Hans Selye's theory, stress is a non-specific response from the body due to a trigger called a stressor. The response can be in the form of a mental or emotional response, resulting in physical health problems such as increased body weight (Andriana & Prihantini, 2021). The research results by Roy et al. (2021) stated that 61.5% of adolescents had moderate-to-extremely-severe stress levels. In the study by Firmanurochim *et al.* (2021), 45% of adolescents experience stress, showing a significant relationship between stress levels and the incidence of being overweight. Stressed adolescents are 4.005 times more likely to experience more nutrition than adolescents who are not stressed. Then the next factor is the role of parents.

Positive parental attitudes towards healthy eating, healthy food provision, and parental supervision are crucial for their children to have good eating habits (Liu et al., 2023). The study by Qomariah *et al.* (2021) mentions parents' role in adolescents' excess nutrition. The proportion of adolescents with excess nutrition who have a terrible parental role is 61.4%. Adolescents with bad parental roles have a risk of 2.832 times experiencing excess nutrition.

The results of a preliminary study conducted at Al-Azhar 1 Islamic High School found that students had an overweight status of 16.1% and obesity of 6.5%. This prevalence is higher than the national percentage, namely overweight by 9.5% and obesity by 4% (RISKESDAS, 2018). Therefore, based on the explanation above, this article was written to discuss the relationship between nutritional

knowledge, eating habits, stress, and the role of parents in the incidence of overnutrition in adolescents at Al-Azhar 1 Islamic High School Jakarta.

METHODS

This research is a type of analytic observational research using a cross-sectional design because the independent and dependent variables are measured and collected at the same time. The research was conducted in July-August 2022 at Al-Azhar 1 Islamic High School Jakarta. The population of this study was all students of class X and XI of Al Azhar 1 Islamic High School Jakarta, totaling 322 people. The sampling technique is accidental sampling. The research sample was 193 people who fulfilled the inclusion and exclusion criteria. The inclusion criteria for this study were students of class X and XI who had active status as students at Al-Azhar 1 Islamic High School Jakarta, were present when the research was being conducted, and were willing to fill out the questionnaire. The exclusion criteria for this study were students in classes X and XI who did not participate in Limited Face-to-Face Learning (PTMT), were on a diet and or were sick, and took supplements or drugs to reduce and increase weight.

The dependent variable of the research is the incidence of overnutrition. Data were collected using a microtoise to measure height and digital scales to measure the respondent's weight. After that, the data was input into the WHO Anthro Plus application to obtain a Z-Score, which stated the nutritional condition of the respondent. Afterward, the Z-Score value data is input into SPSS and processed univariately and bivariate. The independent variables of the study were nutrition knowledge, eating habits, stress, and the role of parents. Data on nutritional knowledge was obtained by filling out the questionnaire independently, while data on eating habits was obtained by filling out the Adoslecent Food Habits Checklist (AFHC) questionnaire. Data on stress was obtained by filling out the Perceived Stress Scale (PSS) questionnaire, and data on parental roles were obtained by filling out the Family Health Climate Questionnaire. for Nutrition (FHC-NU) and the Family Health Climate for Physical Activity (FHC-PA). The data was input into SPSS, then analyzed univariately and bivariate. The bivariate analysis used the chi-square test. This research passed an ethical review on July 6, 2022, with ethics number 03/22.03/01649.

RESULTS AND DISCUSSION

The results of univariate analysis of student characteristics data, including gender, age, occupation and education of parents, nutrition knowledge data, eating habits, stress, and the role of parents, can be seen in table 1.

Table 1. Distribution of Univariate Analysis Results (n=245)

Variables	Number of Respondents	Percentage
Characteristics		
Gender		
Male	115	46,9
Female	130	53,1
Age (Year)		
10-13	2	0,8
14-16	242	98,8
17-19	1	0,4
Father's Education		
Basic education	0	0
Middle education	8	3,3
Higher education	224	92,2
Other	11	4,5
Mother's Education		
Basic education	0	0
Middle education	14	5,7
Higher education	215	93,4
Other	2	0,8
Father's Occupation		
Non-working	7	2,9
Working	229	93,4
Other	9	3,7
Mother's Occupation		
Non-working	110	44,9
Working	135	55,1
Incidence of Overnutrition		
Underweight (z-score −3 SD until <−2 SD)	6	2,4
Normal (z-score −2 SD until +1 SD)	145	59,2
Overweight (z-score >+1 SD until +2 SD)	49	20,0
Obesity (z-score >+2 SD)	45	18,4

Nutrition Knowledge		
Poor (score <60%)	189	77,1
Moderate (score 60 – 80%)	55	22,4
Good (score >80%)	1	0,4
Eating Habits		
Bad (<*median*)	134	54,7
Good (≥ *median*)	111	45,3
Stress		
Mild (score 27-40)	34	13,9
Moderate (score 14-26)	167	68,2
Heavy (score 0-13)	44	18,0
Role of Parents		
Not Good (<mean)	119	48,6
Good (≥ *mean*)	126	51,4

The results showed that most students were female (53.1%), and most were 14-16 years (98.8%). Most of the student's fathers' were at the higher education level (92.2%), most of the student's mothers' education was at the higher education level (93.4%), most of the students' fathers worked (93.4%), and most of the students' mothers worked (55.1%). The univariate analysis also showed that most of the students were in the normal nutrition category (59.2%), had poor nutritional knowledge (77.1%), had bad eating habits (54.7%), and had moderate stress levels (68.2%). Most of the students had not good parental roles (48.6%).

The Relationship between Nutrition Knowledge and Incidence of Overnutrition

Table 2. Results of Bivariate Analysis of the Relationship between Nutrition Knowledge and Incidence of Overnutrition

Nutrition Knowledge	Incidence of Overnutrition						P *Value*	OR
	Overweight - Obesity		Underweight - Normal		Total			
	n	%	n	%	n	%		
Poor	75	39,7	114	60,3	189	100	0,437	1,281
Moderate-Good	19	33,9	37	66,1	56	100		
TOTAL	94	38,4	151	61,6	245	100		

Nutritional knowledge in this study is adolescents' knowledge about the types of nutrients and their functions, the quantity and quality of nutrient intake, and the selection of food choices. The bivariate analysis results obtained a p-value = 0.437, which means there is no significant relationship between nutritional knowledge and the incidence of excess nutrition. These results align with

Maslakhah & Prameswari (2022) research that no relationship exists between nutritional knowledge and overweight status in adolescents (p-value = 0.065). The research on the subject showed that students with overweight nutrition had a lower proportion of knowledge of less nutrition (39.7%) than students with normal nutrition who had less knowledge of nutrition (60.3%). Teenagers also have yet to receive nutrition information beforehand, which can affect the students' nutrition knowledge. Another factor that might influence the level of nutrition knowledge is the lack of nutrition education and/or health promotion for students. Even though there is internet access to access information at this time, they tend to access the internet to open social media. Students carry out information searches via the internet for school tasks, then social media and entertainment content are driven by personal needs (Maslakhah & Prameswari, 2022).

Based on the results of data analysis, students already know that protein functions for the growth and maintenance of body tissues. They also know that being overweight and obese are diseases associated with high-fat consumption, soybeans are not a source of animal protein, limit consumption of fat to no more than six tablespoons per day, and know the types of sources of carbohydrates. However, students still needed to learn about the number of balanced nutrition messages, types of food ingredients containing complex carbohydrates, recommended consumption of vegetables in one day, food sources of animal and vegetable protein, and nutritional status assessment categories.

A lack of nutritional knowledge can reduce adolescents' efforts to balance their food consumption, leading to overnutrition (Maetryani, 2018). However, nutritional knowledge does not directly influence the incidence of excess nutrition in adolescents. Their knowledge cannot be directly applied to their daily lives because teenagers are generally unstable and easily influenced by their environment (Asmini in Tepriandy & Rochadi, 2021). The study's results did not have a significant relationship because of other factors, such as genetics, chronic disease, and lack of physical activity (Maslakhah & Prameswari, 2022b).

The Relationship between Eating Habits and Incidence of Overnutrition

Table 3. Results of Bivariate Analysis of the Relationship between Eating Habits and the Incidence of Overnutrition

Eating Habits	Incidence of Overnutrition						P *Value*	OR
	Overweight - Obesity		Underweight - Normal		Total			
	n	%	n	%	n	%		
Bad	37	27,6	97	72,4	134	100	0,000	0,361
Good	57	42,8	54	68,4	111	100		
TOTAL	94	38,4	151	61,6	245	100		

Eating habits in this study are a person's behavior towards food, such as choosing and limiting foods high in fat and sugar, increasing consumption of vegetables and fruit, and adopting a healthy lifestyle. The bivariate analysis results of the variable relationship between healthy eating habits and the incidence of excess nutrition showed a significant relationship with a p-value = 0.000. The study's results align with the research of Grace et al. (2021), which states that eating habits such as increased fast food consumption, increased intake of chocolates/sweets, and inadequate fruits intake is related to the incidence of adolescent obesity (p-value = 0.0035; 0.0001; 0.01).

Research by Ferinawati & Mayanti (2018) also showed a significant relationship between eating habits in the form of consuming energy sources, sugary drinks, and fast food with the incidence of adolescent obesity (p-value = 0.000). The results of this study obtained an OR value of 0.361. OR value < 1 means a protective factor. This means that respondents with poor eating habits tend to experience overweight obesity less than those with good eating habits. This can be seen because the proportion of respondents who have poor eating habits and are obese is lower than those who have good eating habits and are overweight and obese. Likewise, the proportion of respondents who had poor eating habits and experienced less normal nutrition was higher than those with good eating habits and experienced less normal nutrition.

The five most common healthy eating habits in respondents with excess nutrition are: Respondents often try healthy eating patterns. Usually, they do not add some chocolate or biscuits if they bring lunch. Respondents try to eat lots of fruits and vegetables, not add cream to desserts or drinks, and only sometimes buy pastries, croissants, or cakes. Meanwhile, the five most common unhealthy eating habits include not avoiding eating fried foods and tend not choosing the healthiest desserts when eating at restaurants. Then, do not choose low-fat foods such as vegetables, fruit, et cetera. When having lunch outside the home, do not consume at least three servings of fruit a day, and do not choose low-calorie butter or margarine when spreading butter or margarine on bread.

The five healthy eating habits for respondents with normal and underweight nutrition are the same as those with overnutrition, but the order based on the percentage is different. Then, the five most common unhealthy eating habits are not avoiding fried foods, tending not to choose the healthiest desserts when eating at restaurants. When eating lunch outside the home, they were not choosing low-fat foods such as vegetables, fruit, et cetera. They also do not choose low-calorie butter or margarine when spreading butter or margarine on bread.

The Relationship Between Stress Overnutrition and Incidence of Overnutrition

Table 4. Results of Bivariate Analysis of the Relationship between Stress and Overnutrition

Stress	Incidence of Overnutrition						P *Value*	OR
	Overweight - Obesity		Underweight - Normal		Total			
	n	%	n	%	n	%		

Moderate-Heavy	87	41,2	124	58,8	211	100		
Mild	7	20,6	27	79,4	34	100	0,022	2,706
TOTAL	94	38,4	151	61,6	245	100		

Stress is a teenager's body's reaction to situations that cause pressure and psychological or physical changes. The results of bivariate research between stress and the incidence of excess nutrition have a significant relationship and are indicated by a p-value = 0.022. The results of this study are in line with the research by Firmanurochim *et al.* (2021) and Isramilda (2019), which showed a relationship between stress and obesity in adolescent students (p-value = 0.016; 0.022). Students with medium-severe stress levels have a 2.706 times chance of experiencing more-obese nutrition than students with mild stress levels.

According to Basar et al. (2020), this study's classification of stress levels is divided into three levels: mild, moderate, and severe. 41.2% of students with overweight-obese nutrition had a moderate-to-severe level of stress. The results of the analysis of the question items show that the stress conditions that students very often experience are feeling anxious and depressed, unable to control irritability in life, unsure of their ability to deal with personal problems, and feeling difficulties accumulate. Hence, they cannot overcome them and feel unable to control the essential things in life.

Students can experience changes in appetite when they are under stress. Students with more nutrition will consume more energy. This energy can be obtained from foods high in calories and fat. Meanwhile, students with less nutrition reduced their energy intake or found it difficult to eat. In stressful conditions, the brain will stimulate the secretion of adrenaline, which will then trigger the process of changing glycogen into glucose, thereby accelerating blood circulation. Then, blood pressure will increase, breathing will become faster, oxygen intake will increase, and digestion will be affected. Adolescents with an unstable emotional condition also cause them to tend to run away by consuming lots of foods that contain high calories, high cholesterol, energy, and protein, which in turn can result in excess nutrition within a particular time (Tienne et. al, 2013 in Bitty et al., 2018).

The Relationship between the Role of Parents and the Incidence of Overnutrition

Table 5. Results of Bivariate Analysis of the Relationship between the Role of Parents and the Incidence of Overnutrition

Role of Parents	Incidence of Overnutrition						P *Value*	OR
	Overweight - Obesity		Underweight - Normal		Total			
	n	%	n	%	n	%		
Not Good	47	39,5	72	60,5	119	100		
Good	47	37,3	79	62,7	126	100	0,724	1,097
TOTAL	94	38,4	151	61,6	245	100		

The role of parents in this study is the respondent's perception of the position and efforts of parents in the family, which can affect the nutritional condition of the respondent. The bivariate analysis results of the relationship between parental roles and the incidence of excess nutrition found no significant relationship, as indicated by the p-value = 0.724. These results align with Febriani (2018), which shows that the parents' role does not influence adolescents' nutritional status. The study's results showed that the proportion of overweight students with bad parental roles (39.5%) was lower than students with normal nutrition who had bad parental roles (60.5%).

The data analysis also shows that the parent's role is not good. Respondents and their family not interested in articles that discuss good nutrition for the body, do not talk about or discuss types of healthy food, and families usually do not have compatibility with each other regarding food and food choices available. The respondent's family also does not read articles, magazines, and so on about fitness, physical activity, and sports, does not watch television shows about physical activity and sports, and does not seek information about physical activity and sports.

Parents have a role as a facilitator in supporting the level of physical activity of children and as a facilitator in providing food intake, controlling and guiding their children in eating habits. However, in this study, the role of parents had no relationship with the incidence of excess nutrition. Excess nutrition is not only caused by one factor but is influenced by food intake and energy balance, microenvironment and gut microbiome, and psychological factors (Lin & Li, 2021).

CONCLUSION

Most of the teenagers at Al-Azhar 1 Islamic High School Jakarta have good nutrition, poor nutrition knowledge, poor eating habits, and experience moderate stress. There is a relationship between eating habits and stress with the incidence of excess nutrition. However, there is no relationship between nutrition knowledge and the role of parents in the incidence of overnutrition. Students can reduce the risk of overnutrition by increasing their nutrition knowledge, paying attention to eating habits, and controlling stress levels. Schools can also work with health units to educate students about the problem of overnutrition and then limit food and drinks in the canteen that are high in sugar, fat, and sodium. In manufacturing food, oil is used in moderation and not repeatedly. Future researchers can further investigate other factors that may have a closer relationship with the incidence of overnutrition in adolescents.

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