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Original Research Paper

The Relationship Between Fat Intake and Pocket Money with The Incidence of Overweight in Teenagers at SMA Negeri 1 Toroh

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ABSTRACT

Background: Overweight is a prevalent nutritional issue among adolescents and increases the risk of future health problems such as cardiovascular disease and diabetes mellitus. Key contributing factors include high fat intake and the amount of pocket money, which can influence dietary habits. **Objective:** This study aimed to analyze the relationship between fat intake and pocket money with the incidence of overweight in adolescents at SMA Negeri 1 Toroh. **Method:** A cross-sectional design was used with a sample of 90 students was selected using proportionate stratified random sampling. Data collection involved a 3x24-hour food recall to assess fat intake, a questionnaire on pocket money, and anthropometric measurements to determine overweight status. The Pearson product moment test was used to analyze the relationship between fat intake and overweight, while the Spearman rank test assessed the relationship between pocket money and overweight. **Results:** Most respondents had a deficient fat intake (41.1%), medium-level pocket money (38.9%), and a 41.1% prevalence of overweight. Statistical analysis revealed a significant relationship between fat intake and overweight (p = 0.001) and between pocket money and overweight (p = 0.017). **Conclusion:** Both fat intake and pocket money are significantly associated with the incidence of overweight among adolescents.
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Introduction

Overweight, often referred to as excessive body weight, is a nutritional problem frequently faced by adolescents. According to the Ministry of Health (2018), overweight is defined as a condition in which body weight exceeds the normal limit. A person is classified as overweight if they have a Body Mass Index (BMI) of 23–24.9 kg/m^2[1]. Based on data from the 2018 Indonesian Basic Health Research (Riskesdas), the prevalence of overweight among adolescents aged 16–18 years in Indonesia was 9.5%[2]. According to the Basic Health Research data of Central Java Province, the prevalence of overweight in adolescents was 7.91%. Meanwhile, in Grobogan Regency, the prevalence of overweight among adolescents reached 9.98%[3]. Preliminary findings from a study conducted at SMA 1 Toroh showed that 35% of adolescents were overweight.

Overweight in adolescents significantly affects their lives and health. It can increase the risk of developing metabolic syndrome in adulthood, a higher likelihood of being victims of bullying, disrupt academic performance at school, and lead to worse health outcomes in the future, including an increased risk of obesity, cardiovascular diseases, and diabetes mellitus[4].

Several factors can contribute to overweight, including socioeconomic factors (such as parents' education, occupation, income, family size, and allowance), peer influence, dietary patterns and eating habits (excessive intake of energy, fat, and protein;

low fiber intake; consumption of fast food; breakfast habits), physical activity, parenting style, and sleep patterns[5678].

Faktor yang menyebabkan *overweight* pada remaja salah satunya adalah mengkonsumsi asupan lemak yang berlebih. Menurut penelitian Yanti tahun 2021 menunjukan bahwa asupan lemak sangat berpengaruh terhadap kejadian *overweight* dikarenakan remaja sering mengkonsumsi makanan yang mengandung tinggi lemak contohnya makanan yang mengandung minyak goreng, daging ayam, mentega dan makanan bersantan[9]. Mengkonsumsi asupan lemak berlebih bagi tubuh akan disimpan sebagai cadangan lemak yang akan meningkatkan jumlah lemak sel lemak pada tubuh, cadangan tersebut akan disimpan dibawah kulit, disekitar otot, jantung, paru-paru, ginjal dan alat tubuh lainya, cadangan lemak tersebut akan menyebabkan berat badan berlebih[10].

Selain dipengaruhi oleh asupan lemak berlebih *overweight* juga dipengaruhi oleh faktor ekonomi salah satunya adalah uang saku. uang saku akan menyebabkan seseorang dalam mengkonsumsi makanan. Semakin meningkatnya uang saku yang diberikan sehingga lebih besar peluang mereka untuk membeli makanan dan mengkonsumsi secara berlebih tanpa memperhatikan kandungan gizi yang berada pada makanan yang dikonsumsi, salah satunya digunakan untuk membelikan makanan tinggi energi dan lemak serta serat yang rendah yang mengakibatkan terjadinya berat badan berlebih[11]. Menurut penelitian Sartika tahun 2022 menunjukkan bahwa uang saku berpengaruh terhadap status gizi remaja sebanyak 45,75% uang saku besar dimiliki remaja yang mengalami status gizi lebih [12].

Berdasarkan studi pendahuluan yang dilakukan di SMA Negeri 1 Toroh diketahui siswa memiliki asupan lemak lebih sebesar 55%, uang saku tinggi sebanyak 40%. Asupan lemak yang dikonsumsi dan besarnya uang saku yang dikeluarkan untuk membeli makanan dan minuman akan berpengaruh terhadap status gizi siswa.

Based on the research questions whether there is a relationship between fat intake and the incidence of overweight, and whether there is a relationship between pocket money and the incidence of overweight the researcher is interested in conducting a study titled: "The Relationship Between Fat Intake and Pocket Money with the Incidence of Overweight Among Adolescents at SMA Negeri 1 Toroh."

Materials and Methods

Research Design

This research is a quantitative study using a cross-sectional approach. The independent variables in this study are fat intake and pocket money, while the dependent variable is the incidence of overweight. The study was conducted in September 2024.

Sampel

The population in this study consists of all students of SMA Negeri 1 Toroh, totaling 1,047 students. The sample consisted of 90 students, obtained using the Lemeshow formula and proportionate stratified random sampling technique. The inclusion criteria included students aged 16–18 years, from grades X, XI, and XII, and who were able to stand upright for anthropometric measurements. The exclusion criteria included students who were absent during data collection and those who were on a specific diet (either high-fat or low-fat).

Data Collection Technique

Fat intake was collected through interviews using a 3x24-hour food recall (including both weekdays and weekends), then analyzed using the Nutrisurvey application to calculate the average intake and compare it with the Recommended Dietary Allowance (RDA). The incidence of overweight was measured by weighing the body weight using a digital scale

and measuring height using a microtoise, both conducted twice for accuracy.

Data Analysis Technique

The data were analyzed using univariate analysis to determine frequency distribution and bivariate analysis to test the relationship between variables. Normality testing was performed using the Kolmogorov-Smirnov test. If the data were normally distributed ($p > 0.05$), the Pearson Product Moment test was used; if not normally distributed ($p < 0.05$), the Spearman Rank test was applied.

Etical Consideration

This study has received ethical approval from the Health Research Ethics Committee (KEPK) of the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, with the approval number: No.550/KEPK-FIK/IX/2024.

Results

The results of this study, based on respondents' characteristics such as class level, gender, and age, are presented in Table 1.

Table 1 shows that the majority of respondents were female. Most respondents were 16 years old, accounting for 71.1%. Based on parental characteristics, more than 50% of respondents' mothers were housewives, 35.6% of respondents' fathers were self-employed, and 61.1% of respondents' parents had an income above the 2024 minimum wage (UMR) for Grobogan Regency (Rp 2.116.516).

The main variables used in this study were fat intake, pocket money, and the incidence of overweight. Based on the main variables studied, in terms of fat intake, it was found that the majority of respondents had a fat intake deficit (41.1%), while 23.3% of respondents had excessive fat intake. Regarding the amount of pocket money received, most respondents received a moderate amount ranging from Rp16.000 to Rp20.000, accounting for 38.9%, while 25.6% of respondents received a high amount of pocket money. Concerning the incidence of overweight, 41.1% of respondents were categorized as overweight.

Table 1. Distribution of Respondents' Characteristics by Grade, Age, Gender

Characteristics	Frequency (n)	Percentage (%)
Grade		
Grade X	30	33.33
Grade XI	30	33.33
Grade XII	30	33.33
Gender		
Female	54	60.0
Male	36	40.0
Age		
Age 16	64	71.1
Age 17	22	24.4
Age 18	4	4.4
Father's Occupation		
Civil Servant/Military/Police	9	10.0
Entrepreneur (Small Business)	32	35.6
Entrepreneur (Larger Scale)	11	12.2
Retired	1	1.1
Project Worker	5	5.5
Farmer	17	18.9
Laborer	7	7.7
Merchant	2	2.2
Driver	1	1.1
State-Owned Enterprise (BUMN)	1	1.1
Unemployed	4	4.4
Parental Income		
Below Regional Minimum Wage (RMW)	35	38.9
Above Regional Minimum Wage (RMW)	55	61.1
Fat Intake		
Deficient	37	41.1
Adequate	32	35.6
Excessive	21	23.3
Pocket Money		
Low	32	35.6
Medium	35	38.9
High	23	25.6
Overweight Status		
Overweight	37	41.1
Not Overweight	53	58.9

Source: *Primary Data, 2024.*

Based on interviews regarding fat intake using the 3 x 24-hour food recall form, the food items most frequently consumed by respondents are presented in Table 2.

According to the 3 x 24-hour food recall data, the most commonly consumed carbohydrate sources among respondents, in addition to rice, included instant noodles. The side dishes consumed by respondents consisted of plant-based protein sources such as tofu and tempeh. For animal-based protein sources, respondents mostly consumed chicken eggs, chicken meat, and meatballs. Fat sources

consumed by the respondents included coconut oil, margarine, and coconut milk.

Table 2. Commonly Consumed Food Ingredients Based on 3x24-Hour Food Recall Interviews

Food Ingredients	Household Measurement (URT)
Carbohydrate Sources	
Rice	2 scoops
Instant Noodles	1 pack
Plant-Based Protein Sources	
Tempeh	2 pieces
Tofu	2 pieces
Animal-Based Protein Sources	
Chicken Egg	1 egg
Chicken Meat	1 piece
Meatballs	5 medium-sized balls
Beef	1 piece
Vegetable Sources	
Cabbage	1 tablespoon
Spinach	1 tablespoon
Bean Sprouts	3 tablespoons
Carrot	3 tablespoons
Water Spinach	3 tablespoons
Mustard Greens	2 tablespoons
Fruit Sources	
Banana	1 fruit
Papaya	1 fruit
Orange	1 fruit
Mango	1 fruit
Avocado	½ fruit
Legume Sources	
Peanuts	3 tablespoons
Oil Sources	
Coconut Oil	1 tablespoon
Butter / Margarine	1 tablespoon
Milk and Dairy Products	
Fresh Milk	1 glass
Coconut Milk	3 tablespoons

Source: *Primary Data, 2024.*

Based on statistical tests using the Pearson Product Moment to determine the relationship between fat intake and overweight incidence, and the Spearman Rank test to determine the relationship between pocket money and overweight incidence, the results are presented in Table 3.

According to the statistical test using Pearson Product Moment to examine the relationship between fat intake and overweight incidence (Table 3), it was found that 80.95% of respondents with high fat intake experienced overweight. The relationship between fat intake and overweight is indicated by a p-value of 0.001 and an r-value of 0.343, which shows a very weak but positive correlation—meaning the higher the fat intake, the higher the incidence of overweight.

The Spearman Rank test used to determine the relationship between pocket money and overweight incidence showed that 65.21% of respondents with high pocket money experienced overweight. The p-value of 0.017 indicates a significant relationship between pocket money and overweight, and the correlation coefficient (r_s) of 0.251 indicates a very weak but positive relationship meaning the higher the pocket money, the higher the incidence of overweight.

Table 3. Statistical Test of Fat Intake and Pocket Money with Overweight Incidence

Variable	Overweight		Not Overweight		Total		r	p-value
	n	%	n	%	n	%		
Fat Intake								
Deficient	8	21.62	29	78.37	37	100	0.343	0.001
Adequate	12	37.50	20	62.50	32	100		
Excessive	17	80.95	4	19.05	21	100		
Pocket Money								
Low	10	31.25	22	68.75	32	100	0.251	0.017
Medium	12	34.28	23	65.71	35	100		
High	15	65.21	8	34.79	23	100		

Source: *Primary Data, 2024.*

Discussion

The results of this study indicate that 41.1% of respondents experienced overweight. Overweight can be caused by several factors, including dietary habits and socioeconomic

status. One example of dietary habits is excessive fat intake.

In this study, fat intake categories were classified as deficient (<90%), adequate (90–119%), and excessive (≥120%)[13]. The study showed that 23.3% of respondents consumed excessive fat. Fat intake is closely related to food consumption and nutritional needs[14].

Fat is essential for adolescents because it plays a role in biological growth and development, although excessive consumption should be limited. In addition, fat serves as a source of energy, a solvent for fat-soluble vitamins such as vitamins A, D, E, and K, and it contributes to the formation and structure of body tissues[15].

Based on bivariate analysis in Table 3, it was found that 80.95% of respondents with excessive fat intake were overweight, and the p-value was 0.001, indicating a significant relationship between fat intake and overweight. The correlation coefficient (r) was 0.343, which is positive, indicating a direct relationship meaning the higher the fat intake, the higher the incidence of overweight.

Based on interviews using the 3 x 24-hour food recall method, it was found that respondents frequently consumed foods sourced from carbohydrates such as rice and instant noodles. Protein intake also affects overweight status, as consuming large amounts of protein can be stored in the form of triacylglycerol, which increases body fat[16]. The protein consumed by respondents consisted of both plant-based and animal-based sources. The most commonly chosen plant-based proteins were soybean-based products such as tofu and tempeh. In addition, respondents consumed animal-based proteins such as chicken eggs, chicken meat, meatballs, and beef. These protein sources were most often cooked by frying, which may have contributed to the respondents' excessive fat intake.

Furthermore, respondents frequently consumed fried snacks such as mayonnaise spring rolls, martabak, fried tempeh, vegetable fritters, fried dumplings, and fried meatballs. Outside of school, most respondents also consumed high-fat foods such as seblak, spicy noodles, meatballs, and chicken noodles.

As for fiber sources, respondents consumed vegetables and fruits. Vegetables frequently consumed included cabbage, spinach, bean sprouts, tomatoes, carrots, and water spinach, which were usually cooked by stir-frying or using coconut milk-based broths methods that may increase the fat content of the food consumed. The fruits consumed by respondents included bananas, papayas, oranges, mangoes, apples, and avocados.

According to the Regulation of the Minister of Health of the Republic of Indonesia Number 28 of 2019, the recommended fat intake for female adolescents aged 16–18 years is 70 grams per day, while for male adolescents aged 16–18 years it is 85 grams per day. Fat intake should align with the recommended range, which is 90–199% of the Recommended Dietary Allowance (RDA)[17]. Consuming fat in excess of the recommended limits can increase the risk of being overweight as well as various other health problems[18]. Excessive fat intake over a long period will be stored in the body as fat reserves, generally under the skin, around muscles, the heart, lungs, kidneys, and other organs. If the stored fat, especially fat high in cholesterol, becomes excessive, it can lead to overweight conditions[10].

According to Amalia (2022), a study conducted on 64 adolescents showed a significant relationship between fat intake and overweight nutritional status, with a P-value of 0.045 (P<0.05). This indicates that adolescents with normal fat intake tend to have good nutritional status, whereas excessive fat intake can lead to overweight nutritional status[19]. This finding is supported by a study by Cao in 2020, which stated that high fat consumption has a positive impact on overweight conditions[20]. Furthermore, research by Pusparani in 2022

also found that 52.3% of adolescents with high fat intake were overweight, with statistical analysis showing a P-value of 0.010, indicating a significant relationship between fat intake and overweight among adolescents. Adolescents tend to consume high-fat foods from snacks, fast food, and various fried foods[21].

In addition to being influenced by excessive fat intake, overweight or obesity is also affected by socioeconomic factors[5]. Socioeconomic status consists of occupation and income, where income affects the amount of pocket money given to children. Based on this study, it was found that more than 50% of the respondents' mothers were housewives, while some were employed. For fathers, the majority 35.5% worked as entrepreneurs. About 61.1% of the respondents' parents had an income above the regional minimum wage (UMR). Parents with income above the UMR tended to give their children medium to high amounts of pocket money, usually provided on a daily, weekly, or monthly basis. The amount of pocket money was categorized as low (<Rp 16,000), medium (Rp 16.000 – Rp 23.000), and high (≥Rp 23.000). These categories were determined using the formula: low ($X < M - SD$), medium ($M - SD \leq X < M + SD$), and high ($X \geq M + SD$), where X is the amount of pocket money, M is the mean value from the study, and SD is the standard deviation[22].

Based on the research findings, 38.9% of respondents received pocket money in the medium category, ranging from Rp 16.000 to Rp 23.000, and 25.6% received high pocket money, which was ≥ Rp 23.000. In general, the more pocket money adolescents receive, the more freedom they have in choosing food, which can lead to excessive consumption and an increased risk of being overweight[23].

Based on the statistical test results in Table 6, it was shown that 65.21% of respondents with high pocket money were overweight. The P-value result was 0.017 ($P < 0.05$), indicating a significant relationship between pocket money and the incidence of overweight. Based on the pocket money form filled out by the respondents, the use of pocket money varied among individuals. Some used it for school needs such as photocopying and stationery, public transportation to school, saving money, buying internet data, and paying class dues. However, most respondents used their pocket money to buy food and drinks both during and after school. Respondents used their pocket money at school to buy breakfast and snacks such as fried foods (e.g., risoles, mayo, fried dumplings, fried meatballs, and martabak), chocolate, chips, and packaged drinks. They also often spent their money on other high-fat foods such as seblak, which contains fast food items like sausages, dumplings, cikuwa, and various frozen foods. In addition to seblak, foods purchased outside of school included burgers, cilok, meatballs, and chicken noodles all of which are high in energy and fat but low in fiber. Parental guidance plays an important role in regulating children's pocket money to instill discipline and prevent excessive food consumption behavior[24].

According to a study by Telisa (2020) conducted among adolescents, teenagers with high pocket money are twice as likely to experience overweight compared to those with lower allowances. Adolescents who receive a higher allowance tend to frequently purchase their preferred foods, such as fried and fast foods, without considering the nutritional content of these foods[25]. This is supported by a study by Saprudin (2023), which found that 78.1% of adolescent respondents had high pocket money, with a P-value of 0.000, indicating a significant relationship between pocket money and overweight nutritional status[26]. Furthermore, a study conducted in China involving 1,648 students from 16 primary and secondary schools across four major cities revealed that 69% of students received weekly pocket money. Pocket money was identified as one of the risk factors

influencing dietary patterns and the incidence of overweight[27]. Additionally, a study by Ramayanti (2020) conducted on high school students found a significant relationship between the amount of pocket money and overweight nutritional status[28].

Conclusion

A total of 41.1% of respondents had a fat intake categorized as deficient, while 38.9% received a moderate amount of pocket money ranging from IDR 16,000 to IDR 23,000. Additionally, 41.1% of respondents were classified as overweight. Statistical analysis revealed a significant association between fat intake and the incidence of overweight among adolescents at SMA Negeri 1 Toroh, with a P-value of 0.001 and a weak positive correlation (r = 0.343), indicating that higher fat intake is associated with a higher likelihood of being overweight. A significant relationship was also found between pocket money and overweight, with a P-value of 0.017 and a very weak positive correlation (r = 0.251), suggesting that an increase in pocket money is associated with a higher risk of being overweight.

Therefore, it is important to regularly monitor students' nutritional status through routine weight and height measurements to enable early detection and prevention of overweight issues.

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