Fast Food Consumption Patterns Nutritional Status and Anemia Among Female

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Abstract: This study aims to analyze the patterns of fastfood consumption, nutritional status, and prevalence of anemia among female students in the Nutrition Department of Poltekkes Medan. An observational method with a cross-sectional design was used on 73 female students. Data on the frequency of fastFood consumption was collected using a semi-quantitative FFQ, nutritional status was assessed based on BMI, and hemoglobin levels were measured using the Cyanmethemoglobin method. The results showed that 45.20% of respondents frequently consumed fast food, with an obesity prevalence of 35.70% and anemia prevalence of 35.60%. There was a significant relationship between fast food consumption and nutritional status (p=0.042), but not with anemia status (*p*=0.540). In conclusion high fastfood consumption correlates with obesity and anemia. Efforts are needed to increase the availability of healthy food on campus and further research on the long-term impact of ast Food consumption on student health.

Keywords: Anemia; Consumption patterns; Fast food; Female students; Nutritional status

Introduction

Adolescence is an important life stage marked by dramatic changes in lifestyle patterns. These changes include unhealthier food choices, eating out (especially at fast food restaurants), sedentary behavior, and lack of physical activity, especially among girls, all of which put adolescents at nutritional risk (Al-Hazzaa et al., 2011; Andriyani et al., 2020; Chaput et al., 2020). Adolescents who consume unhealthy foods such as higher energy-dense foods and inadequate intake of fruits and milk are more likely to frequently consume fast food (Carvalho et al., 2021; Kunset et al., 2023; Sebastian et al., 2009). Poor eating habits among adolescents can lead to excessive weight gain and increase the risk of obesity in adulthood because eating habits carried out during adolescence persist into adulthood (Appannah et al., 2021; Todd et al., 2015; Winpenny et al., 2018). Globally, young adolescents, especially those in low- and middle-income countries (LMICs), are experiencing a nutritional transition in the form of changing food consumption patterns from traditional eating patterns in their respective countries to westernized eating patterns (Al-Jawaldeh et al., 2020; Owolodun et al., 2024). Fast food is a common component of Western-style diets, and is energy-dense, nutrient-poor, low in fiber and micronutrients, and high in processed grains, sodium, and sugar (Alkerwi et al., 2015; Biltoft-Jensen et al., 2022; Tso et al., 2021).

The fastfood industry has spread fast food culture worldwide. Fast food outlets and consumers have grown rapidly in developed and developing countries due to the negative health impacts associated with foods high in fat, salt, and sugar. The trend of fast food consumption is increasing due to convenience, cost, menu options, taste and flavor (Rajput et al., 2020; Shah et al., 2014). Students often face time pressures and high academic demands, which often lead them to choose fast food as a quick and easy option (Keats et al., 2018). Reasons students choose fast food include: relatively low prices, convenience of purchasing, short serving time, and taste playing a role in increasing fast food

consumption for students (Oliveira et al., 2024). A study conducted by Li et al. (2020) found that 60.90% of female adolescents consumed fast food once a week, and 20.30% of female adolescents consumed fast food twice or more per week and the frequency of students consuming fast food was mostly twice a week at 31.70%. This study aims to look at the frequency of fastfood consumption, types of fast food consumed, nutritional intake from fast food and non-fast food, and assess the nutritional status of adolescents (anemia status and BMI) among students of the Nutrition Department at the Health Polytechnic of the Ministry of Health in Medan.

Method

Location and Time of Research

The location of this research was conducted at the Nutrition Department of the Health Polytechnic in Medan. Data collection and research were carried out from November 2023 to February 2024. This study has received approval from the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health in Medan with the number: 01.75.270/KEPK/POLTEKKES KEMENKES MEDAN/2023.

Type and Design of Research

This research was conducted using a quantitative method that is observational with a cross-sectional design, which assesses the habit of consuming fast food and the nutritional status of nutrition students. Data collection which includes independent variables and dependent variables was carried out simultaneously within the same research time (Abduh et al., 2022).

Population and Sample

The population in this study were 285 female students of the D-III Nutrition Study Program and D-IV level 1. The number of samples in this study was determined using the Slovin formula, obtained as many as 73 young women. The sampling technique used in this study was Simple Random Sampling (Howell et al., 2020).

Data Collection and Processing

Data on eating frequency were obtained using a semi-quantitative food frequency questionnaire (FFQ) form. Respondents filled out a form containing a list of foods along with the portion size and frequency of respondents' meals in the last 1 month. Determination of nutritional status was obtained by measuring the respondent's body weight (BW) and height (TB) then assessing nutritional status based on BMI. Anemia was measured by looking at a person's hemoglobin level.

Examination of hemoglobin levels was obtained by the Cyanmethemoglobin method.

Sample identity data were processed manually and presented descriptively. Fast food habits were obtained by filling out a semi-quantitative food frequency questionnaire (FFQ) form and categorized with a score of; Never: 0; 2 times a month: 5; 1-2 times/week: 10; 3-6 times/week: 15; 1 time/day: 25; times/day: 50. The food consumption score was calculated based on the number of consumption columns for each type of food consumed and the interpretation of the score was based on the mean value of the respondents' food consumption so that it could be categorized into (Sirajuddin, 2018): rarely if the consumption value < mean score: <17.50; often if the consumption value ≥ mean score: ≥ 17.50. The nutritional status data of young women were categorized: underweight: <18.50; Normal: 18.50 - 25; overweight: >25. Hemoglobin levels were categorized into anemia (Hb < 12 mg/dL) and no anemia (Hb ≥ 12 mg/dL).

Data Analysis

Univariate analysis in this study is the frequency distribution or proportion and characteristics of each variable. Bivariate analysis was carried out on the habit of consuming fast food and nutritional status which was assumed that the two variables had a relationship, as well as consuming fast food and the prevalence of anemia.

Result and Discussion

Univariate Analysis

Most respondents were 18 years old (34.10%), followed by 17 years old (42.10%), 19 years old (8.70%), and 20 years old (1.60%). The majority of respondents lived in boarding houses (82.20%), while the rest lived with their parents (17.80%). Nearly half of the respondents (45.20%) frequently consumed fast food, while 54.80% rarely consumed it. 47.90% of respondents had a normal nutritional status, followed by obesity at 35.7%, and the rest were divided between underweight and overweight (8.20% each). 35.60% of respondents had anemia, while 64.40% did not have anemia.

The most popular types of fast food were bread and fried foods, with bread consumed by 45.90% of respondents three times a day, and fried foods by 59.50% once a day. Fast foods that were consumed less were satay and sardines, which were less popular, with relatively lower consumption compared to other fast foods. Obesity and anemia are epidemics affecting vulnerable populations worldwide. Obesity is associated with an increased risk of type 2 diabetes, heart disease, sleep apnea, and early death. From the data obtained, 35.70% of students in the Nutrition

Department at Health Polytechnic Medan were obese. This is a significant proportion, considering that the prevalence of obesity among college students is generally lower at the national level. For example, the Indonesian Health Survey (SKI) conducted by the Ministry of Health of the Republic of Indonesia in 2023 reported that the prevalence of obesity among the 18 – 25 years old population was around 24.40%.

Table 1. Characteristics of Respondents

Variable	n	Number Percent (%)
Age		
17 years old	11	42.10
18 years old	43	8.70
19 years old	17	34.10
20 years old	2	1.60
Place of residence		
Boarding house	60	82.20
Living with parents	13	17.80
Fast food consumption pattern		
Rarely	40	54.80
Often	33	45.20
Nutritional Status (BMI)		
Underweight	6	8.20
Normal	35	47.90
Overweight	6	8.20
Obesity	26	35.70
Anemia Status		
No anemia	47	64.40
Anemia	26	35.60

This increased prevalence may be associated with factors such as drastically changing eating patterns during college, particularly increased fastfood consumption and a more sedentary lifestyle. Further analysis by Silva et al. (2023) found that college students, especially those living away from home, tend to adopt unhealthy eating habits due to time constraints, lack of nutritional knowledge, and limited access to healthy foods, all of which can contribute to an increased risk of obesity. The data shows that 35.60% of respondents had anemia, which is also higher than the national prevalence. According to data from the 2023 SKI, the prevalence of anemia among women in Indonesia in the same age group ranges from 18.0%. The high prevalence of anemia among these students may be associated with inadequate nutritional intake, particularly iron, which is often lacking in diets dominated by fast food. A study by Wiafe et al. (2023), states that anemia among college students is often associated with poor nutritional knowledge, insufficient iron intake, and unbalanced eating patterns, often due to reliance on processed and fast foods that are low in nutrients.

The high consumption of fast food and the prevalence of obesity and anemia among nutrition students have some serious long-term health implications. Obesity is associated with an increased risk of various chronic diseases, including cardiovascular disease, type 2 diabetes, and certain types of cancer (Bendor et al., 2020; Jin et al., 2023; Yang et al., 2022). Anemia, especially that caused by iron deficiency, can lead to decreased physical and mental work capacity, affecting academic performance and quality of life, (United Nation Children's Fund, United Nation University and World Health Organization (Donat-Vargas et al., 2023). Obesity and anemia can have significant psychological effects, including stigma, depression, and anxiety, all of which affect students' mental well-being (Alkazemi et al., 2021). These social impacts often result in social isolation and decreased self-confidence, which can affect students' social interactions and academic achievement.

Table 2. Types of Fast Food Consumed by Respondents

Types of food	3x/day (50)		1x/day (25)		3-6x / week (15)		1-2x / week (10)		2x/ month (5)		Frequency Never (0)	
	n	%	n	%	n	%	n	%	n	%	n	%
Fried chicken	-	-	31	42.10	25	34.20	13	17.80	4	5.40	-	-
Pizza	-	-	5	6.80	21	28.80	15	20.50	13	17.80	19	26
Sausage	-	-	24	33.80	29	39.20	12	16.20	7	9.50	1	1.40
Nugget	-	-	25	33.80	24	32.40	20	27	3	4.10	2	2.70
Hamburger	-	-	1	1.40	24	32.40	17	23	17	23	15	20.30
Siomay	-	-	2	2.70	27	36.50	30	40.50	12	16.20	3	4.10
French fries	-	-	11	14.90	36	48.60	22	29.70	5	6.80	-	-
Donut	-	-	8	10.80	37	50.0	28	37.80	1	1.40	-	-
Bread	34	45.90	26	35.10	10	13.50	4	5.40	-	-	-	-
Soft drink	5	6.80	8	10.80	27	36.50	31	41.90	2	2.70	1	1.40
Bakso	-	-	18	14.20	32	43.20	23	31.10	1	1.40	-	-
Instant noodles	-	-	3	4.10	36	48.60	29	39.20	5	6.80	1	1.40
Fried rice	-	-	19	25.70	22	29.70	30	40.50	2	2.70	1	1.40
Otak-otak	1	1.40	9	12.20	30	40.50	21	28.40	9	12.20	3	4.10

Types of food	3x/day (50)		1x/day (25)		3-6x / week (15)		1-2x / week (10)		2x/ month (5)		Frequency Never (0)	
Satay	-	-	-	-	30	40.50	28	37.80	14	18.90	2	2.70
Canned sardines	-	-	-	-	15	20.30	20	27	19	25.70	20	27
Fried snacks	1	1.40	44	59.50	25	33.80	-	-	4	5.40	-	-
Packaged coffee	-	-	1	1.40	25	33.80	34	45.90	13	17.60	1	1.40
Chips	1	1.40	32	43.20	32	43.20	9	12.20	-	-	-	-
Batagor	-	-	4	5.40	26	35.10	21	28.40	18	14.20	5	6.80

Observations from the data indicate that nutrition students have a high tendency to consume certain types of fast food such as bread and fried foods. Research by Halim et al. (2023), indicates that fast food preferences among college students are often influenced by factors of convenience, price, and speed of service, which supports their choices under conditions of limited time and resources. This is relevant to the findings in the data that show high consumption of bread and fried foods, which are usually readily available and quick to serve. This high consumption may be due to the ease of obtaining bread, its affordability, and it being considered a quick breakfast or snack option, as well as the popularity of fried foods as tasty but nutrient-poor snacks that are often available on campus.

A cross-sectional study of students from the Nutrition Department at Health Polytechnic Medan found that 45.20% (33 people) consumed fast food in the frequent category. A study among students in Qom, Iran, found a prevalence rate of 72.40% for consuming fast food at least once this month and 34% for at least one type of fast food this week. This study was conducted on students from two different universities in Qom, with a total of one hundred and fifty students from each university. Sandwiches (44.40%), pizza (39.70%), and fried chicken (13.80%) were the most popular fast foods. Fast food consumption tends to have a higher fat content (80% of RDA) compared to non-fast food (54% of RDA). Non-fast food provides significantly better intake of vitamin A, vitamin C, and Fe (iron) compared to fast food. This indicates that non-fast food is richer in essential nutrients that are often lacking in fast food.

Table 3. Average Nutrient Intake from Fast Food and Non-Fast Food

Variable		Total
	Intake	Percent (%) of RDA
Average nutrient intake from fast food		
Energy (Calories)	1103.50	50
Protein (grams)	48.70	75
Fat (grams)	53.80	80
Carbohydrates (grams)	118.80	37
Vitamin A (mg)	143.10	24
Vitamin C (mg)	13.50	18
Iron (mg)	4.30	29
Fiber (grams)	7.20	24.80
Average nutrient intake from non fastfood		
Energy (Calories)	1069.50	50
Protein (grams)	52.30	81
Fat (grams)	35.40	54
Carbohydrates (grams)	135.90	43
Vitamin A (mg)	307.10	50
Vitamin C (mg)	52.30	69
Iron (mg)	6.40	41
Fiber (grams)	14.20	41.30

Fast food tends to contain more fat (80% of RDA) compared to non-fast food (54% of RDA), while non-fast food provides higher protein (81% of RDA) compared to fast food (75% of RDA). A study by Romieu et al. (2017) shows that higher protein consumption from non-fast food sources is usually more beneficial because it is often combined with lower fat intake and other essential nutrients. Non-fast food excels in providing higher vitamin A, C, and Fe compared to fast food. Vitamins A and C are important for immune function, vision, and skin health, while Fe (iron) is crucial for hemoglobin formation. Research by Du et al. (2018) demonstrates that diets rich in fruits and vegetables (commonly classified as non-fast food) improve vitamin and mineral

status, contributing to a reduced risk of chronic diseases. The data shows that fiber intake from non-fast food (41.30% of RDA) is nearly twice as high as that from fast food (24.80% of RDA). Dietary fiber plays an important role in gastrointestinal health and has been shown to reduce the risk of cardiovascular disease. A study by Chen et al. (2018), Weickert et al. (2008), and Waddell et al. (2023), emphasizes the importance of fiber in the daily diet and its association with a reduced risk of metabolic diseases.

Bivariate Analysis

Bivariate analysis of fastfood consumption habits and anemia status there was no significant relationship between fast food consumption habits and anemia status, with a p-value of 0.540. The distribution of respondents between those who rarely and frequently consumed fast food with respect to anemia status was relatively balanced.

Table 4. Distribution of Respondents Based on Fast Food Consumption Habits and Anemia Status

Consumption category	Status Anemia		Amount %	p-value
	Anemia %	Normal %		
Rarely	13 (32.50)	13 (39.40)	40 (100)	
Frequently	13 (39.40)	20 (60.60)	33 (100)	
Total			73 (100)	0.540

Although data from Health Polytechnic Medan did not show a significant relationship between fast food consumption and anemia, other studies such as the one conducted by Shubham et al. (2020) highlight that diet often deficient in iron and other essential nutrients, a common characteristic of fast food that is low in micronutrients, can contribute to the risk of anemia. However, other factors such as overall eating patterns, nutritional status, and supplementation also play important roles in determining anemia status (Beitze et al., 2024). A study by Bohara et al. (2021) reported that students who consumed fast food more than three times a week had lower hemoglobin levels compared to those who consumed it less frequently.

This study emphasized the low nutritional quality of fast food, which is usually poor in iron and essential vitamins that support hemoglobin formation (Bhardwaj et al., 2024). Bivariate analysis of fastfood consumption habits and nutritional status There was a significant relationship between fast food consumption and nutritional status (p-value 0.042), particularly between frequent consumption and higher prevalence of obesity (48.50% in those who frequently consumed) compared to those who rarely consumed (25% in those who rarely consumed).

Table 5. Distribution of Respondents Based on Fast Food Consumption Habits and Nutritional Status

Consumption category	Nutritional Status				amount %	p-value
	Thin %	Normal %	Overweight %	Obesity %		
Rarely	6 (15)	21 (52.50)	3 (7.50)	10 (25)	40 (100)	
Often	0.00	14 (42.40)	3((9.10)	16 (48.50)	33 (100)	
Total					73 (100)	0.042

The data shows that there is a significant correlation between the frequency of fastfood consumption and an increased prevalence of obesity 45.20% of students who frequently consumed fast food showed a higher prevalence of obesity compared to those who rarely consumed it (25% of the group that rarely consumed). A study by Deforche et al. (2015) confirms that high calorie intake and lack of physical activity due to a sedentary lifestyle often associated with students can lead to obesity. Furthermore, Andarwulan et al. (2021) found that the types of food consumed (for example, high in fat and sugar) have a large impact on nutritional status, supporting the analysis results that show a relationship between frequent fast food consumption and poor nutritional status.

Conclusion

Based on data from research at Health Polytechnic Medan, it was found that high fastfood consumption among nutrition department students correlates with several health problems, including obesity and a high prevalence of anemia. Although no significant relationship was found between fast food consumption and anemia, a lack of important nutrients such as iron from a diet dominated by fast food may contribute to this condition. The most frequently consumed fast food choices include bread, fried foods, fried chicken, and instant noodles, indicating consumption patterns that may be lacking in essential nutrients but high in calories.

Conflicts of Interest
The authors declare no conflict of interest.

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