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Analysis of Nutritional Status in Adolescent Girls at PGRI 1 Senior High School, Bogor City

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Abstract

Adolescents are an age group experiencing accelerated physical growth and psychosocial development, thus having high nutritional needs. Imbalanced nutritional intake can cause problems such as anemia, obesity, or malnutrition. At SMA PGRI 1, Bogor City, the prevalence of nutritional problems in adolescents is still quite high. To analyze factors related to nutritional status in adolescents at SMA PGRI 1, Bogor City, in 2025. This study used a quantitative approach with a *cross-sectional design*. Data collection was carried out through questionnaires and anthropometric measurements (BMI). The variables studied included body image, physical activity, nutritional knowledge, dietary patterns, family support, consumption of Fe tablets, and stress levels. Data analysis was carried out using *Spearman's bivariate statistical test*. There is a significant relationship between nutritional status and nutritional knowledge (p=0.001; r=0.879), body image (p=0.001; r=0.897), eating patterns (p=0.001; r=0.810), physical activity (p=0.001; r=0.818), family support (p=0.001; r=0.780), consumption of Fe tablets (p=0.001; r=0.726), and stress levels (p=0.001; r=0.850). There is a significant relationship between body image, physical activity, nutritional knowledge, eating patterns, family roles, compliance with Fe tablet consumption, and stress levels with the nutritional status of adolescent girls. Nutrition education interventions and the formation of healthy living habits in schools are needed, as well as family involvement in supporting the fulfillment of balanced nutrition for adolescent girls.

Keywords: nutritional status, adolescent girls, nutritional status factors of adolescent girls

Introduction

Adolescence (13–18 years) is a transitional phase from childhood to adulthood, marked by physical, psychological, cognitive, and social changes. During this stage, growth accelerates, making nutritional intake crucial. Nutritional issues, both deficient and excessive, can impact adolescent growth, development, intelligence, and productivity.

According to the WHO, adolescents are between the ages of 10–19, while Indonesian Minister of Health Regulation No. 25 stipulates the age range of 10–18. World Obesity Atlas data (2023) recorded 103 million (10%) male adolescents and 72 million (8%) female adolescents worldwide experiencing obesity, while the WHO (2017) reported a prevalence of wasting at 11.1% and overweight at 16.8% among adolescents aged 13–15. In Indonesia, nutritional problems are still influenced by KEP, KEK, anemia, iodine disorders, vitamin A deficiency, and obesity. The 2018 Basic Health Research (Riskesdas) showed that 25.7% of adolescents aged 13–15 and 26.9% of those aged 16–18 experienced stunting, 8.7% were wasted, and 16% were obese. If left untreated, these conditions risk affecting the health of the next generation.

In West Java, the prevalence of stunting in adolescents aged 13–15 years reached 24.1%, higher than in DKI Jakarta (10.05%). In Bogor Regency, 1.56% of adolescents were severely underweight, 4.66% were underweight, 13.7% were overweight, and 5.72% were obese, exceeding the provincial average for overweight and obesity. Data from the East Bogor Community Health Center in 2024 showed that 16.2% of adolescents were undernourished, 7.76% were overnourished, and 8.36% were obese. Nutritional status is influenced by consumption patterns, physical activity, knowledge, economic status, health, and culture. Incorrect eating behaviors, such as strict diets to maintain body shape or fast food consumption, can trigger undernutrition or overnutrition (4–6). The Bogor City Government even launched a mobile Curhat program to monitor nutritional issues, as the phenomenon of underweight is still common among adolescents . Based on these conditions, researchers conducted a study on "Analysis of Nutritional Status in Adolescents at PGRI 1 High School, Bogor City."

Method

This study uses a descriptive correlation design with a *cross-sectional approach* , which aims to describe and analyze the relationship between independent and dependent

variables in one time period. The data used are primary data, obtained by measuring the weight and height of respondents to calculate the Body Mass Index (BMI) according to age. The study population includes all 165 female students in grades X, XI, and XII at SMA PGRI 1 Bogor City. Determination of the sample size was carried out using *the Slovin Formula* using an error rate of 8%, according to the provisions that allow a range of 2%–10 %. The smaller the error rate, the larger the resulting sample size. This study was conducted at SMA PGRI 1 Bogor City in March–August 2025.

The independent variables in this study include: (1) nutritional status, (2) nutritional knowledge, (3) body image, (4) diet, (5) physical activity, (6) family support, (7) compliance with Fe tablet consumption, and (8) stress levels. The dependent variable is nutritional status measured using BMI/U.

Results

Table 1
Characteristics Based on Age and Grade Level of Female Students of PGRI 1 High School, Bogor City (n=80)

Characteristics	Frequency (n)	Percentage (%)
Age		
14 years	19	11.25
15 years	23	28.75
16 years	17	21.25
17 years	22	27.50
18 years	8	10
19 years old	1	1.25
Class		
X	28	35
XI	26	32.5
XII	26	32.5

Based on Table 1, it can be seen that the results of the frequency distribution analysis, from 80 respondents, the majority were in the 15-year-old age group, as many as 23 female students (28.75%), followed by 17-year-olds as many as 22 female students (27.50%), and 16-year-olds, as many as 17 female students (21.25%). Meanwhile, seen from the level of education, the most respondents came from class X with a total of 28 female students (35%), while classes XI and XII each had 26 female students (32.5%).

Table 3
Nutritional Status, Nutritional Knowledge, Body Image, Diet, Physical Activity, Family Support, Compliance with Iron Tablet Consumption, and Stress Levels in Female Students of PGRI 1 High School, Bogor City

Category	Frequency (n)	Percentage (%)
Nutritional status		
Thin	25	31.3
Normal	44	55

Category	Frequency (n)	Percentage (%)
Fat	11	13.8
Obesity	0	0
Nutrition Knowledge		
Not enough	23	28.7
Enough	43	53.8
Good	14	17.5
Body Image		
Positive body image	25	31.3
Negative body image	55	68.8
Dietary habit		
Good diet	28	35
Bad diet	52	65
Physical Activity		
Light	26	32.5
Currently	45	56.3
Heavy	9	11.3
Family Support		
Not enough	22	27.5
Good	46	57.5
Enough	12	15
Compliance with Fe Tablet Consumption		
Obedient	51	63.7
Not obey	29	36.3
Stress Level		
Normal	25	31.3
Light	52	65
Heavy	3	3.8

Based on the analysis results of Table 3, it shows that the majority of respondents have normal nutritional status (55%), while the thin category (31.3%) and obese (13.8%). Nutrition knowledge is mostly sufficient (53.8%), while good (only 17.5%). Body image tends to be negative (68.8%), and eating patterns are generally poor (65%). Physical activity is predominantly moderate (56.3%), with family support mostly included in the good category (57.5%). A total of (63.7%) are compliant in taking Fe tablets. The stress level of the majority is mild (65%), and only (3.8%) experience severe stress.

Table 4
The Relationship between Nutritional Status and Nutrition Knowledge, Body Image, Diet, Physical Activity, Family Support, Compliance with Iron Tablet Consumption and Stress Levels in Female Students of PGRI 1 High School, Bogor City

	r value	P *value*
The relationship between nutritional status and nutritional knowledge	0.879	0.001

The relationship between nutritional status and body image	0.897	0,000
The relationship between nutritional status and eating patterns	0.810	0.001
The relationship between nutritional status and physical activity	0.818	0.001
The relationship between nutritional status and family support	0.780	0.001
The relationship between nutritional status and compliance with iron tablet consumption	0.726	0.001
The relationship between nutritional status and stress levels	0.850	0.001

Based on Table 4, the results of non-parametric statistical tests using *Spearman Rank*, nutritional status has a significant relationship with all factors analyzed ($p < 0.05$). Body image shows the strongest relationship to nutritional status ($r = 0.897$), followed by nutritional knowledge ($r = 0.879$) and stress levels ($r = 0.850$). Dietary pattern and physical activity variables also show a strong correlation with r values of (0.810) and (0.818), respectively. Family support is positively related to nutritional status ($r = 0.780$), while adherence to consuming iron tablets remains significant although the correlation is lower ($r = 0.726$).

Discussion

Univariate Analysis

Nutritional Status, Nutritional Knowledge, Body Image, Diet, Physical Activity, Family Support, Compliance with Iron Tablet Consumption and Stress Level

Based on univariate analysis of 80 respondents, it was shown that the majority had, **(1)** normal nutritional status (55%), while the thin category was found in (31.3%),

and fat in (13.8%), no respondents were found with obesity, **(2)** the level of nutritional knowledge was mostly in the sufficient category, namely (53.8%), while the good category was (17.5%) and the less category was (28.7%), **(3)** most respondents had a negative body image, namely (68.8%), while those who had a positive body image were (31.2%), **(4)** For eating patterns, (65%) were in the bad category, while (35%) had a good eating pattern, **(5)** The physical activity category was dominated by light activity as much as (56.3%), while moderate to heavy activity amounted to (43.7%), **(6)** the majority of respondents received family support in the supportive category, namely (57.5%), while those who did not support were (42.5%), **(7)** compliance with consuming Fe tablets was quite good, with (63.7%) included in the compliant category, while (36.3%) were not compliant, **(8)** the stress level was mostly in the light category, namely (65%), while moderate and heavy stress was found in (35%).

The study results showed that most adolescent girls had normal nutritional status, adequate nutritional knowledge, and good compliance in consuming iron tablets. These findings indicate an adequate understanding of balanced nutrition, which aligns with the role of health education in schools and support from health workers. Research by Sari & Puspita (2021) and Putri & Sari (2021) supports these results, with the majority of adolescents having normal nutritional status and adequate nutritional knowledge. However, other findings indicate a predominance of negative body image, poor diet, and low physical activity. Negative perceptions of body shape can trigger unhealthy eating behaviors, such as skipping breakfast or severely restricting calorie intake, as reported by Putri et al. (2020) and Utami & Hidayati (2019). An unbalanced diet is also influenced by fast food consumption and low fruit and vegetable intake, consistent with the findings of Rahman et al. (2019). Light physical activity is likely related to sedentary habits due to gadget use and a lack of sports facilities, as explained by Wulandari & Puspitasari (2020).

Nevertheless, adequate family support and adherence to iron tablet consumption are protective factors that can reduce the risk of anemia and nutritional problems in adolescents. Research by Handayani & Sari (2020) confirms that family support plays a crucial role in developing healthy behaviors, including regular iron tablet consumption. A relatively low level of stress also contributes to a relatively stable health condition, although stress can still affect eating patterns and body image if not managed properly

(Rahmawati et al., 2020). Overall, these results indicate that although adolescents have relatively good nutritional awareness, challenges remain in behavioral aspects, such as eating patterns, body perception, and physical activity. Therefore, promotive and preventive interventions are needed to strengthen healthy behaviors, for example through nutrition counseling, positive body image education, and physical activity programs in schools.

Bivariate Analysis

1. The Relationship Between Nutritional Knowledge and Nutritional Status

The results of this study align with Notoatmodjo's (2012) theory of health behavior, which states that knowledge is a predisposing factor in health-related decision-making, including food choices. Adolescents with a good understanding of nutrients and the risks of unhealthy eating patterns tend to choose balanced, nutritious foods, thus supporting optimal nutritional status. This is reinforced by research by Rahmah and Suryani (2020) and Sari and Widyaningsih (2021), which confirms that increased nutritional knowledge is associated with normal nutritional status and better consumption patterns. Therefore, efforts to improve nutritional literacy through school education, family support, and media utilization are crucial to preventing nutritional problems in adolescents, especially adolescent girls.

2. The Relationship Between Body Image and Nutritional Status

Good nutritional status is generally associated with a positive body image, while adolescents with undernutrition or overnutrition tend to have negative perceptions of their bodies. This is in line with body image theory, which explains that body image is an individual's perception of body size and shape, influenced by psychological, social, and cultural factors. Self-Discrepancy theory also emphasizes that a discrepancy between self-perception and ideal body shape can lead to dissatisfaction, which can lead to eating disorders and decreased nutritional status. Lestari's (2020) research at SMA Negeri 9 Surabaya demonstrated a significant relationship between body image and nutritional status ($p < 0.001$), where students with a positive body image tended to have better nutritional status. Similar results were reported by Ramadhani (2021) in Pekanbaru with a p value of 0.000 and $r = 0.609$. Based on these results, the researchers assume that building a healthy body image through education and psychosocial support is an

important step in maintaining adolescent nutritional status.

3. The Relationship Between Diet and Nutritional Status

According to the Indonesian Ministry of Health's Balanced Nutrition Guidelines (2014), a healthy diet is characterized by diverse food consumption, a balance between macro and micronutrients, and compliance with daily energy requirements. Diet plays a crucial role in determining nutritional status, particularly during adolescence, which is a phase of rapid growth. The results of this study align with the findings of Putri and Rahmawati (2023) at Yogyakarta State High School, which showed a significant association ($p < 0.05$) between poor diet and an increased risk of overweight in adolescent girls. Furthermore, research by Lestari et al. (2025) published in *the Nutrisehat Journal* confirms that most Indonesian adolescents still maintain poor-quality diets, particularly low consumption of micronutrients such as iron and vitamin A, which contribute to both chronic and acute nutritional problems. Based on these results, the researchers argue that intervention efforts need to focus on improving adolescent eating habits through school-based nutrition education and family involvement, to prevent an increase in nutritional problems in this age group.

4. The Relationship Between Physical Activity of Adolescents and Nutritional Status

Physical activity plays a crucial role in maintaining energy balance, where energy expenditure through activity can balance the intake obtained from food, thus supporting optimal nutritional status (Murray & Rosenbloom, 2020). The results of this study align with those of Sholihah et al. (2023) and Sukartini et al. (2021), which showed that moderate to high levels of physical activity are associated with normal nutritional status, while inactivity increases the risk of being overweight. Based on these results, the researchers assume that maintaining optimal nutritional status requires regular physical activity of at least 60 minutes per day, as recommended by the Indonesian Ministry of Health. The active role of schools and families in fostering active lifestyle habits is crucial as a preventative measure against nutritional disorders that can negatively impact long-term health.

5. The Relationship Between Family Support and Nutritional Status

Purwati et al. (2022) stated that Adolescents who receive full family support tend to have better nutritional intake and controlled eating behaviors, which ultimately support

optimal nutritional status. This finding is reinforced by research by Nurjanah & Hidayah (2021), which shows that family involvement in monitoring food consumption, encouraging physical activity, and providing appropriate health information plays a crucial role in achieving ideal nutritional status in adolescent girls. Based on this, researchers assume that family support is a key factor in developing healthy habits, including nutritious eating patterns, regular eating, and controlled intake, all of which support improved nutritional status. Therefore, effective nutrition interventions must involve families through counseling activities, mentoring in implementing healthy eating patterns, and organizing the home environment to support improved nutritional status in adolescents .

6. The Relationship between Compliance with Iron Tablet Consumption and Nutritional Status

Research conducted by Rini and Nurlaili (2021) demonstrated a relationship between adherence to iron tablet consumption and improved nutritional status and a reduced risk of anemia in adolescents. Wulandari and Mahmudiono (2020) also found that adherence is significantly influenced by education and support from the school and family environment. Based on these findings, the researchers concluded that improving adherence to iron tablet consumption is a strategic step in maintaining nutritional status, preventing anemia, and providing long-term benefits for adolescent reproductive health and productivity.

7. Relationship between Stress Levels and Nutritional Status

Research conducted by Nurjanah and Wahyuni (2022) in Central Java showed that adolescent girls with high levels of stress were significantly more susceptible to nutritional imbalances ($p < 0.05$) due to disrupted eating and sleeping patterns. Research by Rizqi and Utami (2021) also supports these findings, showing that in elementary and junior high school adolescents in Yogyakarta, the higher the stress level, the worse the quality of consumption and nutritional status ($p = 0.003$; $r = 0.62$). Furthermore, the findings of Lestari et al. (2024) confirmed a positive correlation between psychosocial stress and nutritional status disorders among Indonesian adolescents, particularly due to irregular eating patterns and sleep problems. Based on this, the researchers assume that stress management interventions through coping education, psychological counseling, and family and school support need to be an important part of strategies to improve the

nutritional status of adolescent girls so they can develop healthy eating habits and maintain energy balance during growth.

Limitations

This study has limitations in the form of respondents' difficulty in understanding some of the physical activity questionnaire questions so that researchers need to provide additional explanations, the data collection process was carried out after school hours which made respondents less focused and tired, and delays in data collection due to adjustments to school holiday schedules and MPLS activities.

Conclusion

The results of the study showed that the nutritional status of adolescent girls at SMA PGRI 1 Bogor City was mostly in the normal category, although there were still cases of underweight and overweight. Statistical analysis demonstrated a significant relationship between nutritional status and body image, physical activity, nutritional knowledge, eating patterns, family support, adherence to iron tablet consumption, and stress levels, with body image having the strongest correlation with nutritional status.

Thank-you note

I would like to thank the respondents who agreed to participate in this research.

Conflict of Interest

In this study there is no conflict of interest.

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