Dietary Intake and Nutritional Status Profile of Junior High School Students : A Cross Sectional Study in Sidoarjo, Indonesia

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ABSTRACT

Introduction: Healthy diet is essential for healthy development as well as growth. The focus of nutritional evaluation in children is to recognize and avoid nutritional conditions such as malnutrition and obesity, in addition to the associated rise in mortality and morbidity. This study aims to describe dietary intake and nutrition status in junior high school students. *Methods:* The cross-sectional study was conducted from Mei - August 2024 and involved children aged 12-15 years old at private high school. General information and dietary intake collected by questionnaire. The anthropometric measurement obtained through direct physical examination. The data was analyzed using IBM SPSS version 22 software. *Result:* A total 82 participant were included in this study. A normal BMI was observed in 83% of participants, while 12% were classified as overweight. The dietary profile showed 32 (39%), consistently consumed breakfast. Six participants (14%) who consumed breakfast <3 times/weeks were classified as overweight. Approximately 47 people (57%) sometimes took fast food. Five participants (17%) who had fast food >1 times/weeks were overweight. About 19% and 16% of participants consistently consumed vegetables and fruit, respectively. About 46% of participants never consumed health supplements. *Conclusion:* The intake of fast food has risen, while the consumption of fruits, vegetables, health supplements and breakfast has declined. Individuals who consumed breakfast generally exhibit a normal BMI. However, individuals who consumed a significant amount of fast food while having a low intake of vegetables and fruits are more likely to be overweight.

Keywords: dietary intake; nutritional status; junior high school students.

INTRODUCTION

The growth of children from infancy to puberty is an intricate and multifaceted process. A person's biological makeup, along with surrounding factors, health conditions, and nutritional state, plays a significant role in this impact [1]. Healthy diet is essential for healthy development as well as growth [1,2]. The Global Nutrition Reports 2018 highlighted that one in five deaths globally are associated with poor dietary habits, one in twenty children experience hunger, and one in three individuals face malnutrition [3]. In kids and adolescents globally, the incidence of underweight is 8.4% for females and 12.4% for boys [4].

Assessing whether a child has received adequate nutrition and maintains a healthy nutritional status can be complex, as not all children exhibit consistent responses to established dietary indicators [5].

The emphasis of assessing nutrition in children is to identify and prevent nutritional issues like malnutrition and obesity, along with the related increase in mortality and morbidity[6].

The dietary habits of children and infants are influenced by a combination of internal factors, such as genetics, age, and sexuality, as well as external factors, including family, friends, and societal influences [7]. Food preferences are developed at an early age and consolidated in adulthood through monitoring throughout time [8]. Parents have a huge effect that manifests itself throughout both the food on the serving piece and the way on which the food is presented [7]. This study aims to describe dietary intake and nutrition status in junior high school students.

METHODS

This cross-sectional analytic study involved children aged 12 to 15 years at a private junior high school. This study was carried out between May - August 2024. We employed consecutive sampling, and a child who met the inclusion criteria was subsequently involved in this study. The total sample utilized consists of 82 participants. General information and dietary intake gathered through a questionnaire completed by the subject themselves. The anthropometric measurement obtained through direct physical examination. We employed a tape measure and a weight scale to assess body weight (in kilograms) and height (in centimeters). We measured their body weight and height to compute the Body Mass Index (BMI). The subject's body weight, height, and BMI score were then calculated to ascertain the BMI percentile score. BMI was categorized into underweight, normal, overweight, obesity, and severe obesity according to CDC BMI criteria. Individuals with a BMI score below the 5th percentile is classified as underweight, those between the 5th and 85th percentiles are categorized as normal weight, individuals in the 85th to 95th percentiles are considered overweight, and those above the 95th percentile are classified as obese. The ethics committee at Dr Soetomo General Hospital has approved this study, assigned ethic number 17/EC/KEPK/FKUA/2024. The analysis of the data was conducted using IBM Statistical Product and Service Solution (SPSS) version 22 software. The distribution of the data was evaluated through the Shapiro Wilk normality test. Data that follows a normal distribution is represented by the mean and standard deviation (SD), while data that deviates from normality is characterized by its maximum, minimum, and median values. The relationship between the variables was evaluated through the Spearman test. A P-value of less than 0.05 was established as a significant finding of this study.

RESULT

A total 82 participants (40 males and 42 females) were included in this study. The majority of the participants were 14 years of age. The parents of the participants predominantly held bachelor's degrees. The allowance for participants spending is 67%, exceeding IDR 300,000 per month. A normal BMI was observed in 83% of participants, while 12% were classified as overweight, and only 4% and 1% were categorized as underweight and obese, respectively. (Table 1).

The dietary profile indicated that 32 (39%), consistently consumed breakfast. Approximately 34 participants (41%) who consumed breakfast more than three times per week maintained a normal BMI. Six participants (14%) who consumed breakfast fewer than three times per week were classified as overweight, while one participant (2%) who did so was classified as obese. Approximately 47 people (57%) sometimes took fast food, while only 2 participants (2%) consumed it consistently. About 47 participants (88%) who consumed fast food less than once a week maintained a normal BMI.

Five participants (17%) who had fast food more than once a week were overweight but 21 (72%) of them still had normal BMI. A total of 16 participants, including 19%, consistently consumed vegetables. Approximately 4 (40%) overweight participants and 1 (100%) obese individual seldom consumed vegetables. Only 13 people, or 16%, consistently consume fruit. Additionally, 10 participants (77%) who consistently ingested fruit were classified as normal BMI. About 46% of participants never consumed health supplements. Only seven of participants (18%) had never taken health supplements and were classified as overweight (Table 2).

TABLE 1: Characteristic of Subject.

Characteristic	Subject (n=82)
Sex	
Male	40
Female	42
Age, mean (range), years	14,3 (13 - 15)
Father Education	
Junior High School	2
Senior High School	18
Bachelor Degree	62
Mother Education	
Junior High School	1
Senior High School	20
Bachelor Degree	61
Allowance (per month)	
< IDR.300,000	25
>IDR.300,000	57
BMI for age (SDS)	
Underweight	3
Normal	68
Overweight	10
Obesity	1
Severe Obesity	0

DISCUSSION

The overall dietary intake demonstrates a notable variety, particularly regarding dietary habits. According to our study, a small percentage of students ate breakfast. Participants who consistently consume breakfast appear to maintain a normal BMI, while those who skip breakfast tend to be overweight; however, this difference is not statistically significant. The research conducted by Maraschim et al in 2023 indicated that 73% of participants consistently consumed breakfast, a finding that aligns with previous studies conducted in Brazil, which reported regularity rates ranging from 79% to 91%. [9]. Sincovich et al. (2020) reported a comparable finding, indicating that approximately 55% of subjects consistently did not skip breakfast. The increase in breakfast omission over the past decade may indicate shifts in family dynamics and behaviors, highlighting a growing focus on dietary culture among children [10].

The evolution of family dynamics and the modernization of parental roles have contributed to a decrease in the prevalence of students skipping breakfast. People residing in economically deprived, regional, or remote areas exhibited a higher likelihood of skipping breakfast [10].

Numerous studies indicate that skipping breakfast correlates with overweight and obesity, and skipping breakfast heightens the risk of both conditions [11]. Having breakfast is linked to healthy dietary habits. Research indicates a correlation between skipping breakfast and the intake of bigger meal portions and snacks throughout the day. Previous research has suggested that breakfast omission is associated with unhealthy dietary patterns, marked by elevated consumption of fast foods, soft drinks, and meals heavy in salt and lipids. This element likely affects the outcome [12].

There was a restricted consumption of vegetables and fruits among participants but significant intake for fast food. Participants who intended to consume low amounts of fast food reported had a normal BMI. A poor intake of fruits and vegetables is associated with overweight status, however this correlation is statistically not significant. Between 2015 and 2018, fast food represented an average of 13.8% of the total calorie intake among children and adolescents aged 2 to 19 years [13].

In Indonesia, expenditure on fast food grew from 16.72% in 2002 to 34.27% in 2020 [14]. The increasing number of fast food establishments and their presence in various facets of the community, including public institutions, community organizations, and healthcare facilities, facilitates easy access for children and their families [15,16]. Additionally, families with higher income levels exhibited increased rates of fast food consumption [17].

Fast food may negatively impact body weight by replacing more nutritious options [15]. A variety of studies reveal connections between fast food consumption and childhood obesity, while also emphasizing effects on other aspects of child development, including academic performance and cognitive growth [18]. The consumption of fast food may not be directly correlated with heightened energy intake and weight gain; rather, it may act as an indicator of other harmful behaviors [19]. In Indonesia, the prevalence of obesity among school-age children (5-12 years) has increased from 8.0% in 2013 to 9.2% in 2018 [12] Adolescence requires a dietary habit that complies with nutritional requirements due to the significant developmental changes and growth that occur throughout this phase.

TABLE 2: Dietary Intake Profile.

Diet	BMI				P-value
	Underweight (n=3)	Normal (n=68)	Overweight (n=10)	Obesity (n=1)	
Having Breakfast					
Always	3	24	5	0	
Sometimes	0	19	1	0	0.452
Seldom	0	11	1	1	
Never	0	14	3	0	
Breakfast Frequency					
<3 times / weeks	3	34	6	1	0.531
>3 times / weeks	0	34	4	0	
Fast Food Intake					
Always	0	1	1	0	
Sometimes	2	39	6	0	0.706
Seldom	1	23	3	1	
Never	0	4	0	0	
Fast Food Intake Frequency					
<=1 times / weeks	1	47	5	0	0.731
>1 times / weeks	2	21	5	1	
Vegetables Intake					
Always	0	13	3	0	
Sometimes	1	38	2	0	0.709
Seldom	2	17	4	1	
Never	0	0	1	0	

Diet	BMI				P-value
	Underweight (n=3)	Normal (n=68)	Overweight (n=10)	Obesity (n=1)	
Fruits Intake					
Always	0	10	3	0	
Sometimes	0	31	5	0	0.070
Seldom	3	24	2	1	
Never	0	3	0	0	
Health Supplements					
Always	0	1	1	0	
Sometimes	2	39	6	0	0.160
Seldom	1	23	3	1	
Never	0	4	0	0	

A diet predominantly consisting of fast food is associated with a diminished consumption of fruits and vegetables [15,19]. In accordance with the most recent New Zealand Health Survey, 51.4% of children met the recommended daily vegetable intake and 72.4% ate proper fruit [16]. Research from Indonesia indicates that 93.5% of children aged ten and older consumed fruits and vegetables less often than the recommendations set by the Ministry of Health [20]. Conversely, adequate consumption of fruits and vegetables is crucial for children's health [16]. The insufficient intake of fruits and vegetables correlates with poor academic outcomes in children. Moreover, children who have sufficient intake of fruits and vegetables exhibit a reduced risk of obesity and related health issues, and appear more likely to cultivate healthy eating habits throughout their lives [16].The limited consumption of fruits and vegetables correlates with parental food preferences and household income levels. Parents who demonstrate the consumption of fruits and vegetables are likely to encourage their children to eat the same [21].

The consumption of health supplements among participants was notably low. The little number of participants never took health supplements, yet they were classified as overweight; however, this finding is also statistically not significant. Countries like Australia and China exhibit notable utilization rates of health supplements, with 22.6% and 32.4% of children, respectively. More than 30% of children in the United States have taken health supplements [22]. Nonetheless, when it comes to obesity, the evaluation of multivitamins is limited. High levels of vitamin consumption can disrupt the body's balance, while a lack of vitamins can worsen existing health issues [23]. Dietary supplements have the potential to enhance overall nutritional status, effectively addressing nutrient deficiencies while also allowing for nutrient intake to surpass recommended upper limits [24].

CONCLUSION
The overall dietary intake shows diversity especially dietary habits. The intake of fast food has risen, while the consumption of fruits, vegetables, health supplements and breakfast has declined.

Individuals who consumed breakfast generally exhibit a normal BMI. However, individuals who consumed a significant amount of fast food while having a low intake of vegetables and fruits are more likely to be overweight.

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