Exploring Balanced Nutrition Knowledge and Nutritional Status among Adolescent Girls in Urban Areas

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ABSTRACT

The nutritional status is indirectly influenced by the level of knowledge, which can affect an individual's attitudes and behaviors in food selection and ultimately impact their nutritional status. This study aims to analyze the relationship between balanced nutrition knowledge and the nutritional status of adolescent girls at State Senior High School (SSHS) 9 Manado. Employing an analytical survey method with a cross-sectional approach, the research was conducted from February to June 2023 at SSHS 9 Manado. The study sample comprised 100 adolescent girls selected through stratified random sampling. Nutritional status was assessed using a digital scale with a precision of 0.1 kg for weight measurement and a microtoise with a precision of 0.1 cm for height measurement. Additionally, a questionnaire consisting of 20 questions was administered to the adolescent girls to collect data on their nutrition knowledge. The research findings indicate that 49% of the respondents possessed sufficient nutrition knowledge, with 81% having a normal nutritional status. Statistical analysis using the Kruskal-Wallis test revealed no significant relationship between balanced nutrition knowledge and the nutritional status of adolescent girls, with a p-value of 0.610. Thus, it can be concluded that there is no significant association between balanced nutrition knowledge and the nutritional status of adolescent girls in this study.
Keywords: balanced nutrition; adolescent girls; knowledge; nutritional status

INTRODUCTION

The intricate relationship between nutritional status and physical well-being underscores the importance of understanding the factors influencing dietary intake. According to Kanah (2020), nutritional status is influenced by the delicate balance between energy requirements and nutrients derived from food consumption, with significant impacts on overall health. Analysis of the 2018 Basic Health Research data reveals a diverse landscape of adolescent nutritional profiles. Among those aged 13-15 years, prevalence ranges from severe underweight at 1.9% to obesity at 4.8%, with 75.3% falling within the normal range. Similarly, adolescents aged 16-18 years exhibit varied nutritional statuses, with severe underweight at 1.4% and obesity at 4.0%. In North Sulawesi province, where cultural and dietary diversity abounds, distinct patterns emerge. Prevalence of severe underweight among adolescents aged 13-15 years stands at 1.5%, while obesity affects 6.6%. Among older adolescents aged 16-18 years, severe underweight diminishes to 0.7%, yet overweight and obesity persist at 11.4% and 5.0%, respectively. These statistics illuminate the multifaceted nature of adolescent nutrition and underscore the need for targeted interventions to address varied nutritional needs across different age groups and regions (Kementrian Kesehatan RI, 2018).

Nutritional status is influenced by various factors, with nutrition knowledge playing a pivotal role in shaping adolescents' nutritional well-being. Understanding of nutritional intricacies significantly influences attitudes and behaviors towards food choices, ultimately impacting overall nutritional status. Studies have indicated that individuals with higher levels of nutritional knowledge tend to exhibit better nutritional status, thus fostering more optimal growth trajectories (Fitriani *et al*., 2020). However, adolescence often marks a critical juncture where nutritional

challenges emerge, stemming from erroneous dietary practices and a dearth of nutritional understanding influencing eating habits. Striking a balance between nutrient intake and recommended dietary allowances tailored to the unique needs of adolescents is paramount for fostering optimal growth and development (Jayanti and Novananda, 2017). Moreover, adolescents frequently grapple with the dual burden of malnutrition, grappling with both undernutrition and overnutrition. Addressing these nutritional and health concerns during adolescence holds immense significance, offering a pivotal window of opportunity to impart crucial nutritional knowledge and instill healthy eating habits and lifestyles that can profoundly impact their future well-being (Lestari *et al*., 2022).

Insufficient understanding of nutrition stands as a significant risk factor in the onset of nutritional issues and shifts in dietary patterns during adolescence, as highlighted by Aulia (2021). It's pivotal for adolescents to grasp nutritional concepts, empowering them to make informed choices about their diet and recognize the intricate link between food, nutrition, and well-being, as emphasized by Fristika and Amallia (2022). Nutrition during adolescence assumes a pivotal role, laying the groundwork for lifelong health and nutritional adequacy. Optimal nutrition, characterized by a well-rounded diet, fosters physical growth and development, ensuring overall well-being. Notably, insights into balanced nutrition wield considerable influence over adolescents' nutritional status, as echoed by Soraya *et al*., (2017). Evidently, a deeper comprehension of nutrition correlates with superior growth outcomes, underscoring the importance of nutritional education in shaping adolescents' health trajectories.

In urban settings like Manado, adolescents often face unique challenges related to nutrition compared to their rural counterparts. The rapid pace of city life often leads to erratic eating habits and a reliance on convenient yet often lacking in nutrition food choices. These dynamics underscore the marked disparities in the adolescent experience between urban and rural locales. Situated in the heart of North Sulawesi's urban hub, State Senior High School (SSHS) 9 Manado emerges as a pivotal institution. Initial surveys conducted until February 2023 revealed 2174 students enrolled at SSHS 9 Manado. Conversations with school officials unveiled monthly health education sessions, including discussions on iron supplementation, organized by the Bahu Community Health Center. However, upon further inquiry, it became apparent that many female adolescents at SSHS 9 Manado were unfamiliar with the concept of balanced nutrition. This revelation propelled the researchers to delve into the nexus between balanced nutrition knowledge and the nutritional status of female adolescents within SSHS 9 Manado.

METHODS
Research Design and Sampling
This research was conducted from February to June 2023, focusing on female students in grades X and XI at SSHS 9 Manado. The research employed an analytical survey method with a cross-sectional study approach. The sample consisted of 100 adolescent girls selected using stratified random sampling, determined using the Lemeshow formula.

Data Collection and Statical Analysis

Data regarding balanced nutrition knowledge were collected using a validated questionnaire consisting of 20 questions, while nutritional status was assessed through weight measurements using a SECA brand scale with a precision of 0.1 kg, and height measurements using a SECA brand stadiometer with a precision of 0.1 cm. Body Mass Index (BMI) was calculated and deviations were standardized accordingly. Weight measurements were conducted on a flat and well-lit surface to ensure accuracy, and height measurements were taken under similar conditions to minimize errors. In the statistical analysis, the data were first coded and cleaned before the procedures of univariate and bivariate analyses were performed. This study conducted Kruskal-Wallis test calculation in bivariate analysis ($p<0.05$) in order to examine the significance. Data statistical analyses in this study utilized a computerized statistical tool.

Ethical considerations

Each respondent received a detailed explanation regarding the nature, objectives, and potential benefits of the research, along with the assurance that their participation was entirely voluntary. They were informed that all data and information collected would be treated confidentially and solely utilized for research purposes. Additionally, respondents provided their consent by signing an informed consent form. This study obtained ethical clearance and approval with reference number KEPK/01/09/292/2023, ensuring adherence to ethical guidelines and underscoring the commitment to maintaining the integrity and confidentiality of participant data throughout the research process.

RESULTS AND DISCUSSION
Sample Characteristics, Balanced Nutrition Knowledge, and Nutritional Status Overview

The study focused on female adolescents attending SSHS 9 Manado, with a robust sample size of 100 respondents, all falling within the age bracket of 14 to 17 years. A detailed breakdown of respondents' age and grade is meticulously presented in **Table 1.** Upon closer examination of class dynamics, the analysis reveals a noteworthy distribution, with Grade X accommodating 50 (50.0%) adolescent girls, while Grade XI mirrors this count with an equivalent number of 50 respondents (50.0%). Furthermore, scrutinizing age demographics, a discernible pattern emerges: the majority of adolescent girls, constituting 42 (42.0%) respondents, are centered around the age of 16, whereas those at the tender age of 14 are distinctly in the minority, represented by a solitary respondent, making up a mere 1.0% of the total sample.

Table 1. Sample Characteristics Analysis

Category		Frequency
Grade	X	50
	XI	50
Age (years old)	14	1
	15	41
	16	42
	17	16

The respondents in this study, aged between 14 to 17, represent the adolescent demographic, as defined by the Regulation of the Minister of Health of the Republic of Indonesia, spanning from 10 to 18 years old. Adolescence, a phase bridging childhood to adulthood, marks a period of profound physical, cognitive, and emotional development. This transitional journey often reflects in evolving dietary habits, as adolescents navigate towards choices aimed at maintaining their body weight. The significance of nutritional knowledge becomes evident in this context, as deficiencies in understanding can profoundly impact their nutritional well-being (Agnesia, 2020).

The assessment of balanced nutrition knowledge unveils insights categorized across three tiers: good, fair, and poor. In examining 100 female adolescents from SSHS 9 Manado, the distribution of balanced nutrition knowledge levels is depicted in **Table 2**. Results from the balanced nutrition knowledge questionnaire indicate that among the respondents, 48 (48.0%) displayed a good level of knowledge, 49 (49.0%) demonstrated fair knowledge, while a smaller proportion, only 3 (3.0%), exhibited poor knowledge. Furthermore, data on nutritional status were garnered through measurements encompassing weight (W), height (H), and age of the female adolescents from SSHS 9 Manado. These measurements allowed for the classification of nutritional status into four categories: undernutrition, normal nutrition, overnutrition, and obesity. Analysis revealed that 3% were undernourished, 11% were overweight, 5% were obese, and the majority, constituting 81%, maintained a normal or good nutritional status.

Table 2. Distribution of Respondents according to Balanced Nutrition Knowledge and Nutritional Status

Variables		Frequency
Balanced Nutrition Knowledge	Good	48
	Adequate	49
	Poor	3
Nutritional Status	Undernutrition	3
	Normal	81
	Overweight	11
	Obese	5

Knowledge plays a pivotal role in shaping individuals' behaviors and choices. It influences how we approach various aspects of life, particularly evident in our dietary habits (Tarawan *et al*., 2020). Balanced nutrition, as defined by Yosephin (2018), refers to a diet that provides the necessary nutrients in appropriate quantities to meet individual needs. However, inadequate knowledge about nutrition among adolescents poses a challenge, often resulting in malnutrition or overnutrition. In a recent study focusing on balanced nutrition knowledge, it was revealed that among adolescent girls, 48% exhibited good knowledge, 49% had sufficient knowledge, and only 3% displayed poor knowledge. While this suggests an overall satisfactory level of awareness, the disparity between good and sufficient knowledge is minimal. Notably, the prevalence of poor knowledge is significantly lower compared to good and sufficient knowledge levels, hinting at potential gaps in nutrition education within schools, as observed during visits to SSHS 9 Manado.

Interviews with adolescent girls at the school further underscored their limited understanding of balanced nutrition concepts.

Echoing findings by Muliyati (2019), this research uncovered that 40.4% of adolescents had sufficient nutrition knowledge, 36.2% had insufficient knowledge, and 23.4% demonstrated good knowledge. Concurrently, 85.1% maintained normal nutritional status, with 14.9% being overweight. These results underscore the significance of nutrition education, as they imply that an individual's level of nutritional knowledge directly influences their dietary decisions and, consequently, their understanding of the nutritional value of their food choices.

Nutritional status, a critical determinant of overall health, hinges on both food consumption adequacy and the body's ability to utilize nutrients effectively (Sofiatun, 2017). It is gauged through anthropometric and biochemical assessments, primarily focusing on weight and height measurements. For adolescents, being overweight is defined as having a BMI z-score between >1SD to 2 SD, while a BMI z-score >2SD indicates obesity. Thus, maintaining a healthy diet is paramount in ensuring optimal nutritional status and overall well-being.

The Relationship between Balanced Nutrition Knowledge and Nutritional Status

The nutritional status, encompassing a spectrum from poor nutrition to obesity, underwent a reclassification into three overarching categories: undernutrition, adequate nutrition, and overnutrition. Here, poor nutrition and undernutrition were merged into the undernutrition category, while overnutrition and obesity were amalgamated into the overnutrition category. Meanwhile, the variable of nutrition knowledge retained its original scoring. Following this, the Kruskal-Wallis test was employed to examine the relationship between balanced nutrition knowledge and nutritional status, as determined by BMI.

Table 3. The Relationship between Balanced Nutrition Knowledge and Nutritional Status

Balanced Nutrition Knowledge Score				
	n	Mean	Mean Ranks	*p-value*
Undernutrition	3	78,33	44,00	0,610
Normal	81	78,83	50,36	
Overweight	16	80,00	52,44	

*Kruskal-Wallis

The results from the statistical analysis using the Kruskal-Wallis test presented a significant finding of 0.610. In interpreting this, a value above 0.05 indicates no discernible relationship or difference, whereas a value below 0.05 suggests a significant relationship between the variables under study. With this obtained result of 0.610 (Asymp.Sig > 0.05) (**Table 3**), it implies that there is no significant relationship between balanced nutrition knowledge and nutritional status. This lack of association might be attributed to the intricate interplay between various factors; while knowledge plays a role, it may not be the sole determinant of nutrient intake,

especially considering the direct influence of infectious diseases and overall dietary habits.

Drawing parallels with a study conducted by Windiyani (2022), this research also employed statistical analysis to investigate the potential link between balanced nutrition knowledge and nutritional status, utilizing the Gamma test. The analysis unveiled no significant association between knowledge and nutritional status (p=0.579), implying that the connection between balanced nutrition knowledge and nutritional status lacks significance. The correlation coefficient of 0.117 further supports this notion, indicating a weak positive correlation with minimal correlation strength (Windiyani, 2022).

CONCLUSION

Conducted at SSHS 9 Manado, a study involving 100 adolescent girls delved into the intriguing relationship between balanced nutrition and their nutritional status. Surprisingly, the findings unveiled a commendable grasp of balanced nutrition among these young individuals, coupled with a prevalent norm of normal nutritional status. However, despite this promising scenario, the study stumbled upon a perplexing revelation: no significant correlation emerged between balanced nutrition and the nutritional status of adolescent girls at SSHS 9 Manado. This intriguing result beckons further inquiry into unexplored factors that might sway the nutritional status of these young women. Moreover, it underscores the potential value of educational interventions tailored to enhance nutritional knowledge and practices among adolescents, thereby fostering their overall health and well-being.

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