

The Relationship between Nutritional Knowledge and Nutritional Status in Sports Special Class Students

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Abstract: Lack of knowledge about nutrition in athletes can lead to a mismatch between nutrient intake and energy expended during the exercise process. Sport special class student are students in their early teens who undergo special programs, where students run training programs according to specialization sports and academic activities. This study aims to analyze the relationship of nutritional knowledge with the nutritional status sport special class students and analyze the most understood and not understood nutritional knowledge material with the NUKYA (Nutrition Knowledge for Young and Adult Athlete) questionnaire. The research design is cross sectional, conducted at SMPN 1 Surakarta in January 2023. The sampling technique was carried out with a simple random sampling technique so that 129 was obtained as the minimum number of research samples. The collection of personal data such as age, gender and address was filled in by the respondents themselves. Nutritional status data using anthropometry, and determined based on BMI / U. Nutritional knowledge data using the NUKYA (Nutrition Knowledge for Young and Adult Athlete) questionnaire. Nutritional status data is carried out weight and height weighing with strature meters and digital body scales that have been calibrated. Data analysis using the Chi Square test. The results showed that there was no relationship between nutritional knowledge and nutritional status ($p > 0.05$). Meanwhile, the highest nutritional knowledge in KKO students based on sub-material analysis on the questionnaire is in the nutrition periodization category and the lowest score in the macronutrient category

Keywords: Nutrition Knowledge, Nutritional Status, Sport Special Class

INTRODUCTION

Nutritional knowledge is one aspect of several determinants of eating behavior that can be modified (Jauhari, 2020). Nutritional knowledge is basic information related to energy, proportions, types of nutrients, and eating habits applied by individuals based on information sources received until adopted into a daily habit. (Kesztyüs et al., 2017). In adolescence, problems related to adolescent nutrition are caused mainly by wrong eating behavior, so there is a nutritional imbalance in their food intake against the recommended nutritional adequacy figures. Adolescence is the transition from childhood to adulthood. Therefore, fulfilling nutrition during adolescence is essential; in certain conditions, adolescents need special nutrition, such as

adolescents with high physical activity (active in sports) and other physical activity activities (Firmansyah & Muhammad, 2021). Adolescents who engage in sports have an increased need for nutritional needs in infancy, but many do not meet adequate daily nutrient intake recommendations (Bingham et al., 2015).

Knowledge related to nutrition is one of the factors that can influence decision-making related to the reasons for choosing to eat in adolescents. Research conducted by (Hitendre et al., 2022) shows that many athletes have suboptimal food intake and inadequate dietary knowledge, which can translate into poorer food choices. Good nutritional knowledge goes hand in hand with good nutritional behavior, as evidenced by healthy eating choices (Noronha et al., 2020). Therefore, the level of nutritional knowledge will affect attitudes, behaviors, and eating habits in choosing foods related to the focus of a person's nutritional condition. According to research conducted by (Jauhari, 2020), generally, athletes and coaches need more knowledge about sports nutrition to create an environment that can produce good performance and optimal health. Researchers want to conduct research on nutritional knowledge in students of the Special Sports Class student at Surakarta and analyze the most understood and understood nutritional knowledge because special sport class students are students in their early teens who have high physical activity so that knowledge as a provision for breeding professional athletes should not be ignored. This paper aims to analyze the relationship between nutritional knowledge and the nutritional status of particular sports class students. This research is expected to be an evaluation in monitoring the nutritional and health status of Sports Special Class students in Surakarta, so it is expected that students in the Sports Special Class have good physical quality accompanied by good nutritional knowledge.

METHODS

This research is observational analytic with a Cross-sectional research design. This research will be conducted in the Special Sports Class of SMP Negeri 1 Surakarta. The population of this study was all Special Sports Class students at SMPN 1 Surakarta. Three classes consist of classes 7, 8, and 9. The Sports Special Class in each batch amounted to 64 students. So the total student population amounts to 192 students. Calculation of sample size using OpenEpi software, which is an application for calculating sample size in cross-sectional research with Margin of error (α) = 5%, Confidence Level (CI) = 95%, Population size (N) = 192, and Response distribution = 50%, so that the minimum sample size from the calculation is 129.

The sampling technique in this study was carried out by simple random sampling. The inclusion criteria in this study are Sports Special Class Students who actively participate in school activities academically and regularly exercise, and are willing to follow the research to the end. In contrast, the Exclusion criteria are students who must fill in the required data completely. The instrument used is the NUKYA (Nutrition Knowledge for Young and Adult Athletes) questionnaire to assess nutritional knowledge. The NUKYA questionnaire has been adapted, translated by a sworn translator, and through a series of tests of the questionnaire's validity and reliability. The questionnaire was developed based on the latest athletes' dietary guidelines and thoroughly reviewed by experts. The questionnaire consists of 24 questions with 59 items covering four different sections: macronutrients, micronutrients, hydration, and periodicity of food intake (Nor Azizam, 2022).

The interpretation of the assessment of nutritional knowledge using NUKYA is classified into two categories, namely scores $\leq 60\%$ and above as adequate knowledge, and if the score $\geq 60\%$, then nutritional knowledge is inadequate (Nor Azizam, 2022). Each section of the questionnaire will be analyzed to get the highest level of knowledge score in each section. Measurement of nutritional status in adolescents is influenced by their age period; age-related disorders are influenced by puberty in adolescents. With changes in age, changes in body composition and body density occur. The calculation of body mass index in adolescents uses BMI / U indicator. BMI / U nutritional status data use anthropometry by measuring student weight and height. The results of the BMI calculation are included in the Z-Score formula, with a body mass index with a BMI / U index for children aged 5-18. Calculating the Z score formula will produce a value that can be used to interpret categories and nutritional status thresholds by category. Physical changes in height and weight gain occur during puberty. Adolescents are one of the age groups in the nutrition-vulnerable, nutrition-prone adolescents category. High-speed growth and development require more energy. On the other hand, changing the lifestyle and eating habits of young people following the correction of energy input and nutrition is not appropriate, so young people develop nutritional problems the elderly (Widnatusifah et al., 2020)

Table 1. Categories and Thresholds of Nutritional Status of Children 5-18 years old, Regulation of the Minister of Health of the Republic of Indonesia Number 2 of 2020 concerning Child Anthropometry Standards. Jakarta:

Nutritional Status Categorize	z-score
Severely thinnes	<-3 SD
Underweight	-3 SD s.d. <- 2SD
Normal	-2 SD s.d. +1 SD
Overweight	>+ 1SD s.d. +2SD
Obese	>+ 2SD

The data were analyzed bivariate to determine the relationship between nutritional knowledge and nutritional status in the Special Sports Class students at SMPN 1 Surakarta. Statistical test using Chi-Square test with 95% meaningfulness. This research received a research permit from the Health Research Ethics Committee (KEPK) Faculty of Medicine UNS (No: 04/UN27.06.11/KEP/EC/2023).

RESULTS AND DISCUSSION

Response Characteristics

The total number of research respondents was 133, with male respondents totaling 82 people (61.7%) and women amounting to 51 people (38.3%). The percentage of nutritional status of respondents was categorized into three based on the findings of the z-score calculation, with the category of undernutrition amounting to 4 respondents (3%), good nutrition 104 respondents (78%), and nutrition more than 25 respondents (19%). The respondents of the study were students in the early adolescent category, ranging from the age of 12-16 years, with a distribution of 12 years old 12 people (9%), 13 years old 42 people (31.6%), 14 years old 48 people (36.1%), 15 years old 29 people (21.8%) and 16 years old two people (1.5%).

The special sports class has 11 sports with different distributions; the sports with the most students are football 29 (21.8%) and volleyball 27 (20.3%). During the characteristics of nutritional knowledge, 35.3% of special sport class students have adequate nutritional knowledge, and 64.7% have inadequate nutritional knowledge

Tabel 2. Characteristics of Respondents

Characteristic	sum	
	n	%
Gender		
Male	82	61.7%
Woman	51	38.3%
Age		
12 Years	12	9%
13 Years	42	31.6%
14 Years	48	36.1%
15 Years	29	21.8%
16 Years	2	1.5%
Nutritional Status		
Undernutrition	4	3%
Normal	104	78%
Overweight	25	19%
Sports		
Table tennis	8	6%
Swimming	6	4.5%
Taekwondo	11	8.3%
Football	29	21.8%
Volly	27	20.3%
Judo	4	3%
Athletics	16	12%
Karate	7	5.3%
Archery	7	5.3%
Tennis	4	3%
Fencing	6	4.5%
Silat	8	6%
Nutrition Knowledge		
Adequate	47	35.3%
Inadequate	86	64.7%

Nutritional knowledge is basic information related to energy, proportion, type of nutrients, and eating habits applied by individuals based on information sources received until adopted into a daily habit (Wulandari et al., 2019). Consumption patterns and nutritional adequacy influence the absorption of nutrients. Consumption patterns and nutritional adequacy are closely related to the diversity of food forms consumed and the level of nutritional knowledge. Nutritional information influences attitudes and behaviors in food selection. Nutritional knowledge will lead individuals to overall health, represented by their nutritional status (Oktavia & Amelia, 2022).

Lack of knowledge in adolescents due to immature psychological factors in adolescents. Adolescents need to understand nutrition properly. Although adolescents already understand the importance of maintaining health through food intake, this cannot be directly practiced due to greater exposure to external factors. Adolescents still depend on the lifestyle of their parents.

Perception of memory and comprehension are different. Most adolescents do not know the nutritional needs of the body. So the match between nutrient intake and energy balance released needs to be balanced. In adolescents with high activity, non-fulfillment of nutrients will result in impaired growth and development. At the same time, adolescents with less physical activity and excess nutritional intake will lead to obesity. Nutritional factors affect individual growth and development (Jayanti & Novananda, 2019).

Nutritional Knowledge

In this study, distribution data is shown in Table 3 based on nutritional status. In the category of adequate nutrition knowledge, there were two students (1.5%) in the undernutrition category, 39 students (29.3%) in the excellent nutrition category, and as many as six students (4.5%) in the more nutrition category. Meanwhile, in the category of inadequate nutrition knowledge, as many as two students (1.5%) in the undernutrition category, 65 students (48.9%) in the excellent nutrition category, and 19 students (14.3%) in the more nutrition category. In general, based on the results of filling out the nutrition knowledge questionnaire for KKO students, most students (64.7%) are in the category of inadequate nutrition knowledge, and only 35.3% have adequate nutrition knowledge.

Table 3. Distribution of Nutritional Knowledge on Nutritional Status

Nutrition Knowledge	Sum		Total
	N	%	
Adequate			
Undernutrition	2	1.5%	35.3%
Normal	39	29.3%	
Overweight	6	35.3%	
Inadequate			
Undernutrition	2	1.5%	64.7%
Normal	65	48.9%	
Overweight	19	14.3%	

Based on Table 3, most students with good nutritional knowledge and good nutritional status still have less nutritional knowledge. Although the distribution of nutritional knowledge in the nutrition category is uneven, the nutrition category is dominated by the proportion of students with better nutritional status and less nutritional knowledge, which is outside of Hidayant's research. (2016) There is no difference in nutritional information between overweight and non-

overweight adolescents or in the physical condition and physical activity between overweight and non-overweight adolescents. In addition to general nutritional knowledge data analysis, researchers also conducted nutritional knowledge analysis on each part of nutritional material in a questionnaire consisting of macronutrients (27 items), micronutrients (19 items), hydration (8 items), and periodicity of food intake (3 items). The percentage of each section is based on correct answer points divided by the number of questions in each section. Based on the results of the analysis of the four categories of nutritional material presented in the questionnaire, the highest accuracy and understanding is in the meter periodization of eating 75.1%, hydration, and micronutrients have the same percentage of 51.1% and the last is macronutrient 32.3%.

Table 4. Nutritional Knowledge Analysis

Sub-Mater	Adekuat Score > 60%	
	N	%
Makronutrient	43	32,3%
Karbohidrat	105	78,9%
Protein	49	36,8%
Lemak	13	9,7%
Mikronutrien	68	51,1%
Hydration	68	51,1%
Feeding periodization	100	75,1%

Nutritional knowledge in the macronutrient category has the lowest percentage of the other four categories. The main parts of macronutrients are fats, proteins, and carbohydrates (Zahra & Muhlisin, 2020). *Macronutrients* are nutrients that play a role in contributing energy to the body. In sports activities, macronutrients are essential; macronutrients provide calories for energy, including carbohydrates, proteins, and fats. Macronutrients play an essential role in providing metabolic substrates (providers of energy needed for skeletal muscle contraction and cardiovascular work) (Firmansyah & Muhammad RAP, 2021)

In general, macronutrient needs are adjusted to the level of activity; in athletes, macronutrient needs must follow the type of exercise, duration of exercise, and body weight. The needs of each source of nutrition are different; the heavier the intensity of the exercise, the more needed both substances are. KH (Carbohydrate) needs range from 55-70% calories, 20% protein, and 10-20% fat (Dwi Jayanti & Elsa Novananda, 2019).

4.3 The Relationship of Nutrition Knowledge with the Nutritional Status of Sports Special Class

Students

Bivariate analysis is used for variables that are thought to be related or have a correlation. This study uses bivariate analysis to analyze independent variables against dependent variables. In this study, the relationship between nutritional information and nutritional status was measured by bivariate analysis. In this study, a test was carried out using the chi-square test. The chi-square test result was obtained at $p < 0.05$. Therefore, it can be concluded that there is no relationship between the independent and dependent variables. The following are the results of testing the relationship between nutritional knowledge and nutritional status.

Table 5. Bivariate test of Nutritional Knowledge with nutritional status in sport special class students

Variabel	Nutritional Status			P-value
	Undernutrition	Normal	Overweight	
Nutrition Knowledge				
Adequate	2(1.5%)	39(29.3%)	6(4.5%)	0,188
Inadequate	2(1.5%)	65(48.9%)	19(22.1%)	

The bivariate analysis results in the table showed that nutritional information was not related to nutritional status ($p = 0.188 > 0.05$). Nutritional information includes information about the correct selection and daily intake and provides all the nutrients necessary for the body's normal functioning. The selection and consumption of foodstuffs affect a person's nutritional status. According to research conducted by Fanny (Laily Ni'matul Aliyah, 2021), there is no relationship between nutritional status and adolescents due to adolescents' unstable psychological state, increased nutritional needs, and poor nutrition. In addition to knowledge, many other factors, such as pocket money, parental income, and the application of less knowledge in daily life, can affect balanced eating behavior at a young age. Based on the results of the above research, it can be concluded that good nutritional knowledge is only sometimes followed by good nutritional status; many factors are involved and influence the formation of nutritional status in addition to nutritional knowledge. In research conducted by Rahayu (2020), the factors that play the most role in nutritional status in adolescents are diet, physical activity, and body image. Nutritional knowledge and nutritional status do not have a significant relationship because knowledge indirectly influences nutritional status; the direct influence on nutritional status is nutritional intake and infectious diseases.

CONCLUSION

In this study, it was found that nutritional knowledge with nutritional status was separate. Based on research results, good nutritional knowledge is only sometimes followed by good nutritional status, and vice versa. Students' nutritional knowledge in special sports classes still needs to be improved. The nutrition knowledge material that students most diminutive is the macronutrient section. Although statistically based on the findings, there is no relationship between nutritional knowledge and nutritional status. Based on nutritional knowledge, data on sports special class students is still meager, so comprehensive and periodic nutrition education is needed to prepare provisions for long-term athlete breeding. As for the research results, micronutrient knowledge in KKO students is still relatively low, where micronutrients are the nutrients most needed by athletes as the primary energy source. Based on the results of the questionnaire analysis, students need help understanding the content of food ingredients consumed daily. Nutritional education can be the primary material for students to form awareness and healthy eating habits. Provision of nutritional information needs to be done to improve long-term sports performance and performance as a provision for athlete breeding.

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