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Description of nutritional knowledge and body mass index of college students in Sumenep

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ABSTRACT

Knowledge and nutritional status play an essential role in the health of college students. This research aims to determine the level of nutritional knowledge and its relationship to the nutritional status of students. Quantitative methods with a cross-sectional study approach were used in this research. The research respondents were 3rd-semester Health and Recreation Physical Education, STKIP PGRI Sumenep students. The sampling technique uses a purposive sampling technique. Data on nutritional knowledge was obtained using a questionnaire, and weight and height data was obtained using scales and a stadiometer. Nutritional knowledge and BMI data were entered and processed in Microsoft Excel 2010 and then analyzed using SPSS version 2020. Most students (66.2%) were classified as normal nutritional status with an average BMI of 22.54±4.09. Most students' nutritional knowledge level was classified as poor (56.9%), with an average knowledge score of 57.46 ± 14.09. There was no significant relationship between the level of nutritional knowledge and students' BMI (p>0.05).
***Keywords**: BMI, college students, nutritional knowledge*

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INTRODUCTION

Understanding the relationship between nutritional knowledge and nutritional status in students is crucial for managing body health. With the current increase in obesity among people aged >18 years, including students, this research becomes even more significant. The obesity rate among people aged >18 years in Indonesia has risen from 15.4% to 21.8%. Obesity can arise from a variety of interconnected factors, including genetic predispositions, environmental influences, behavioral choices, hormonal imbalances, and the effects of certain medications (Kementerian Kesehatan RI, 2022).

Therefore, this study on the nutritional knowledge and BMI of college students is a timely and important contribution to the field of student health and nutrition. But no research has been conducted on the relationship between nutritional knowledge and body mass index (BMI) among students in Sumenep, highlighting a significant gap in understanding how these factors interplay within this particular population. This absence of data suggests a critical need for comprehensive studies that could inform local educational programs and health initiatives aimed at improving student well-being and addressing potential underweight or overweight. Nutritional knowledge is awareness of nutrients and their relevance to health and well-being. It is the ability to find reliable information about food and how food is included in a balanced

diet (Perry et al., 2017). Nutritional knowledge includes various types of nutrients, functions of nutrients, sources of nutrients, benefits of nutrients, healthy food choices, healthy food processing techniques, and the impact of excess and deficiency of nutrients in the body.

Nutritional status can be defined as the result of the intake of nutrients received to meet nutritional needs, thereby enabling the utilization of nutrients to be maintained in the body (Fernández-Lázaro & Seco-Calvo, 2023). Nutritional status can be assessed in various ways, including dietary surveys, body mass index (BMI), biochemical, and clinical assessments. Deficiency, excess, or imbalance of various nutrients in the body can have measurable adverse effects on body composition, function, and clinical outcomes (Allen & Saunders, 2023). The choice to assess nutritional status using BMI is due to its simplicity and low cost, as opposed to other methods that require specialized equipment and expertise. Poor nutritional status can cause various health problems, such as obesity, diabetes, and cardiovascular disease. In addition, inadequate nutrition can affect cognitive function, causing decreased concentration, memory, and academic performance.

In contrast, research by Romadhoni et al. (2023) shows that someone who has a good body mass index (nutritional status) has a relationship with strength and agility in sports. In addition, according to Prieto-Latorre et al. (2024), the ideal body mass index plays a vital role in shaping the well-being of teenagers and their interactions with peers at school. In this case, students are protected from bullying due to a non-ideal body mass index. Increasing nutritional knowledge and improving their eating habits is essential to create healthy students. Usually, students with good nutritional knowledge make healthy food choices.

This is expected to impact achieving ideal nutritional status and academic success. Colleges, families, and communities must work together to provide resources and education that promote nutrition education. By prioritizing nutrition, we aim to improve health, students' academic performance, and overall quality of life. The research sample consisted of students in the Physical Education Study Program, who had received education in health and nutrition. They were expected to have adequate knowledge and nutritional status. Therefore, it is crucial to know the level of nutritional knowledge and its relationship to the nutritional status of STKIP PGRI Sumenep students.

METHODS

Quantitative research using a cross-sectional study design was used. The crosssectional research design was selected for its efficiency, simplicity, and cost-effectiveness, particularly suited to the high mobility of students. This approach allows for quick data collection at a single point in time, providing valuable insights without the need for extensive resources or time. The

research was conducted in October 2024 at the STKIP PGRI Sumenep Campus. The population of this study were students of the Health and Recreation Physical Education Study Program. The research respondents were 3rd-semester students of the Physical Education Study Program. Purposive sampling to select participants based on predefined criteria 3rd-semester student, Physical Education Study Program Student, willing to be a research respondent by signing informed consent. A total of 65 students participated in this research, providing a robust dataset for analysis.

Data on students' nutritional characteristics and knowledge was obtained by interviewing using a questionnaire developed based on the *Pedoman Gizi Seimbang* (Kementerian Kesehatan RI, 2014), the student's nutritional knowledge score is calculated, which is divided into poor (score <60), moderate (score 60-80), and good (score >80) (Khomsan, 2021). Body weight and height data were obtained using a digital weighing scale and stadiometer. Then, the body mass index value is calculated using the formula $\mathbf{BMI} = \frac{\mathbf{weight(Kg)}}{\mathbf{height(m)^2}}$. A BMI value of <17.0 is classified as severely underweight, 17.0-18.4 is classified as mildly underweight, 18.5-25.0 is classified as normal, 25.1-27.0 is classified as mildly overweight, and >27.0 is considered severe overweight. Severe underweight and severe overweight were grouped into severe nutritional problems, mild underweight and mild overweight were grouped into mild nutritional problems, and normal nutritional status was grouped into no nutritional problems. Data on students' characteristics, nutritional knowledge, and nutritional status were processed and presented descriptively, including number (n), percentage (%), average, and standard deviation.

The Kolmogorov-Smirnov test showed a significance value of 0.00 ($p < 0.05$), indicating that the data were not normally distributed. Dataset examined in this study does not adhere to a normal distribution, featuring two key variables whose relationship warrants a closer analysis. Given the ordinal nature of the data, employing Spearman's rank correlation is more appropriate, as it effectively captures the strength and direction of the association between these variables without the assumptions required for parametric tests. Spearman rank analysis was used in the 2020 version of the SPSS application. Analysis was used to determine the relationship between nutritional knowledge and the nutritional status of STKIP PGRI Sumenep Student

RESULTS AND DISCUSSION

Results

The age, gender, and nutritional status of students are presented in Table 1. The average

age of students is 19.69 ± 1.2224 years. Most of the students (89.2%) belonged to early adulthood.

Table 1. Distribution of students based on characteristics

Characteristics	n(%)	Mean±SD
Age		19.69±1.24
Early adulthood	58(89.2)	
Teenager	7 (10.8)	
Gender		
Man	58(89.2)	
Woman	7 (10.8)	
Nutritional status (BMI)		22.54±4.09
Severe underweight	3(4.6)	
Mildly underweight	4(6.2)	
Normal	43(66.2)	
Mildly overweight	7(10.8)	
Severe overweight	8(12.3)	

It can also be seen that most of the students are male. The average BMI score of students was 22.54 ± 4.09. The average BMI score shows that most students (66.2%) have normal nutritional status. 4.6% and 6.2% are classified as severely and mildly overweight. Apart from being underweight, it turns out that there are also a small number of students who are mildly overweight (10.8%) and severely overweight (12.3%).

Table 2. Distribution of students based on level of nutritional knowledge

Level of nutritional knowledge	n(%)
Good	3(4.6)
Moderate	25(38.5)
Poor	37(56.9)
Mean±SD	57.46±14.09

Most students' nutritional knowledge level was classified as poor (56.9%). 38.5% have moderate nutritional knowledge, and only 4.6% have good nutritional knowledge. The average student nutritional knowledge score was 57.46 ± 14.09.

A cross-tabulation of the level of nutritional knowledge and the level of nutritional problems is presented in Table 3. Spearman's rank analysis results show no significant relationship between nutritional knowledge and nutritional status ($p>0.05$). However, it is worth highlighting that some students with sufficient and lacking nutritional knowledge (6.22% and 10.8%) experience severe nutritional status problems. Severe nutritional problems experienced by students include severely underweight or severely overweight.

Table 3. Cross-tabulation of the level of nutritional knowledge on nutritional status problems

Level of nutritional knowledge	Level of nutritional problems			Total	*p-value*
	Severe	Mild	No problem		
Good	0(0)	2(3.1)	1(1.5)	3(4.6)	0.532
Moderate	4(6.2)	5(7.7)	16(24.6)	25(38.5)	
Poor	7(10.8)	4(6.2)	26 (40.0)	37(56.9)	
Total	11(17.0)	11(17.0)	43(66.1)	65(100.0)	

Discussion

Most of the students belong to early adulthood. This age is the first time a person leaves adolescence for adulthood, which requires even higher responsibilities. Most of the students were male because the respondents came from the health and recreation physical education study program. This study program is usually more popular with men than women. In the Physical Education Study Program, a total of 65 individuals participated in the survey, among whom 7 were female, representing approximately 10.77% of the respondents. The small number of women studying sports may be due to concerns about gender discrimination in their future careers (Forsyth et al., 2019).

A small number of students have nutritional status of severe and mild underweight or severe and mild overweight. These two problems are multiple nutritional problems that are faced not only by Indonesia but also by the world. The results of research on students in Thailand showed higher results; namely, 21.5% were underweight (BMI<18), and 13% were overweight (BMI≥25) (Pengpid & Peltzer, 2015). Research of Ren et al. (2015) shows that the overall prevalence of underweight in male students is 14.2%, overweight is 11.5%, and obesity is 2.5%, while for female students the prevalence of underweight is 27.5%, overweight is 2.4% and obesity is 0.3 %. Various factors cause these two nutritional problems.

Factors that can cause students to become overweight are low physical stress and poor sleep quality (Dakanalis et al., 2024), and unhealthy lifestyles (Telleria-Aramburu & Arroyo-Izaga, 2022). As lectures progress, assignments, exams, and lecture activities will increase. It will increase stress levels and reduce students' sleep time. An unhealthy lifestyle, namely choosing foods that are high in sugar and fat, can trigger weight gain if it is not balanced with balanced physical activity. According to Kok et al. (2023), smoking and skipping breakfast are also risk factors for the prevalence of obesity in students. Such as the incidence of underweight being related to several factors, namely low intake of energy and macronutrients (Karno et al., 2024; Khattak & Mustafa, 2023), and insufficient sleep time (Yen et al., 2018).

Being overweight can cause various health problems and even economic problems. Various problems caused by being overweight, namely diabetes mellitus, dyslipidemia, hypertension, cardiovascular disease, obstructive sleep apnea and hypoventilation syndrome, cognitive impacts, and dementia (Lam et al., 2023), economic problems (Okunogbe et al., 2021), even BMI high levels cause 4.0 million deaths globally (Afshin et al., 2017), like the (Astuti et al., 2022) results of the eating patterns showed in the underweight category. Likewise, being underweight also causes health problems. Being underweight is associated with a risk of infection (Dobner & Kaser, 2018), and even a higher mortality rate.

For this reason, it is necessary to overcome double-burden nutritional problems in students. One solution to tackling obesity is by increasing physical activity. Good physical activity is aerobic exercise, which significantly impacts weight loss (Bellicha et al., 2021; Pfisterer et al., 2022). Aerobic sports such as running, swimming, cycling, and aerobic exercise can be an option for students who are overweight. Additionally, the duration of exercise may be necessary in losing weight. According to Willis et al. (2020), early-excercise (completing ≥50% of the training session at 07.00-11.59) is faster in losing weight compared to late-excercise (completing ≥50% of the training session at 15.00-19.00).

However, research of Brooker et al. (2023) states that no strong evidence supports certain exercise times for weight loss. So students need to exercise at least every day, whether in the morning, afternoon, or evening. Besides physical activity, eating regulation must be considered when managing body weight (reducing or gaining weight). According to large portions of food can increase energy intake significantly, whereas consuming low-energy foods (such as fruit, vegetables, and soup) maintains feelings of fullness while reducing energy intake. Therefore, students need to have nutritional knowledge about nutrients, the function of nutrients, food sources, portions, and types of food in their daily menu.

Nutritional knowledge is expected to change a person's behavior when choosing the type and portion of food. Most students' nutritional knowledge falls into the poor category. These results are not much different from the research of (Herviana et al., 2022), which shows that some nutrition students in the Riau Islands have low nutritional knowledge (38%). The low level of nutritional knowledge, even among nutrition students, shows the need to continue aggressively promoting nutrition among students. According to (Almansour et al., 2020), nutritional knowledge can help people adopt healthier eating habits.

Statistically, no significant relationship exists between nutritional knowledge and the level of nutritional problems based on BMI. These results align with research by Piralaiy et al. (2024), which states that the level of nutritional knowledge is not a significant factor in students' BMI. Linking the level of nutritional knowledge with BMI seems too far and ignores several factors that influence BMI. According to Andrew et al. (2023), nutritional knowledge influences food intake and eating practices, influencing students' BMI. The limitation of this study is that linking nutritional knowledge and BMI without including students' eating practices and food intake is inappropriate.

In the future, examining the relationship between eating practices and students' food intake in Sumenep is necessary. Apart from that, it is necessary to promote nutrition promotion to increase students' nutritional knowledge. As nutritional knowledge increases, it is hoped that the problem of being overweight or underweight in students can be resolved. The limitation of this study is that linking nutritional knowledge and BMI without including students' eating practices and food intake is inappropriate.

CONCLUSION

Most students have insufficient nutritional knowledge. Most students have normal nutritional status. Some students are severely overweight and severely underweight. There is a need to promote nutritional knowledge and weight management on campus to increase students' nutritional knowledge and solve nutritional status problems. This research can be used as a description of the level of nutrition and body mass index in Sumenep. The limitation of this study is that linking nutritional knowledge and BMI without including students' eating practices and food intake is inappropriate.

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