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THE RELATIONSHIP BETWEEN STRESS AND NUTRITIONAL STATUS OF STUDENTS IN INDONESIA: A CROSS-SECTIONAL STUDY

Hubungan Antara Stress Terhadap Status Gizi Mahasiswa di Indonesia: Studi Cross Sectional

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ABSTRACT

Background: Nutritional status is the condition of the body caused by food intake and nutrient utilization. The categories of nutritional status are undernutrition, normal nutrition, and over nutrition. Nutritional status can be categorized in various ways, including using the body mass index (BMI). **Purpose:** was to determine the relationship between stress and nutritional status of university students. **Methods:** This research design used a cross-sectional design due to the analysis of this research which. The population in this study were students of the Faculty of Public Health, Universitas Islam Negeri Sumatera Utara. The sample was done by random sampling which amounted to 210 respondents. This research was conducted at the Faculty of Public Health, Universitas Islam Negeri Sumatera Utara in July 2024. The research data collected were processed using SPSS version 21 with Univariate and Bivariate tests. Collecting research data using the SRQ 29 (Self-Reporting Questionnaire) questionnaire developed by WHO. **Results:** There is a relationship between stress and the nutritional status of students (p-value = 0.003). **Conclusion:** Stress affects the nutritional status of students even though there are other factors that can affect the nutritional status of students such as diet, physical activity, and others.

Keywords: university students, nutritional status, stress

ABSTRAK

Latar Belakang: *Status gizi ialah kondisi tubuh yang disebabkan oleh asupan makanan dan pemakaian zat gizi. Kategori dari status gizi terdiri dari gizi buruk, gizi normal, dan gizi lebih. Pengelompokan status gizi bisa menggunakan berbagai cara, termasuk memakai indeks massa tubuh (IMT).* ***Tujuan:*** *Untuk mengetahui hubungan stress dengan status gizi mahasiswa.* ***Metode:*** *Desain penelitian ini memakai desain cross sectional dikarenakan penelitian ini merupakan penelitian analisis Populasi didalam penelitian ini merupakan mahasiswa Fakultas Kesehatan Masyarakat Universitas Islam Negeri Sumatera Utara. Pengambilan sampel dilakukan dengan cara random sampling yang berjumlah 210 orang responden. Penelitian ini dilakukan di Fakultas Kesehatan Masyarakat Universitas Islam Negeri Sumatera Utara pada bulan juli 2024. Data penelitian yang terkumpul diolah menggunakan SPSS versi 21 dengan uji Univariat dan Bivariat. Pengumpulan data penelitian dengan menggunakan kuesioner SRQ 29 (Self-Reporting Questionnaire) yang dikembangkan oleh WHO.* ***Hasil:*** *Hasil dari penelitian ini adalah terdapat hubungan antara stress dengan status gizi mahasiswa (p-value = 0,003).* ***Kesimpulan:*** *Stres mempengaruhi status gizi mahasiswa walaupun ada faktor lain yang bisa mempengaruhi status gizi mahasiswa seperti pola makan, aktivitas fisik, dan lainnya.*

Kata Kunci: *mahasiswa, status gizi, stress*

INTRODUCTION

Nutritional status is the condition of the body caused by food intake and nutrient utilization. There are three categories of nutritional status: undernutrition, normal nutrition, and over nutrition. Nutritional status can be categorized in various ways, including growth Z-Score measurement, food consumption assessment, head circumference measurement, and body mass index (BMI). In this study, researchers used BMI measurements to make it easier and more practical because it only collected body weight and height (Bitty *et al*., 2018).

BMI is often used to categorize a person as having poor or adequate nutrition and whether they are overweight or obese. BMI is calculated by dividing body weight in kilograms by height in meters squared. BMI is a commonly used measure of body composition that helps measure the degree of overweight and obesity in adults (Shabira *et al*., 2024).

The global prevalence of undernutrition in 2022 is 8.2% for females and 10.8% for males. The prevalence of obese young adults is 6.9% for females and 9.3% for males (UNICEF & WHO, 2023). The prevalence of nutritional problems in Indonesia based on BMI values, namely underweight (thin), normal weight, and overweight at the age of > 18 years in 2018 underweight nutritional status was around 9.3%, the prevalence of overweight nutrition was 13.6% and obesity was 21.8%. According to the Indonesian Health Survey (IHS) in 2023 the prevalence of underweight and very underweight nutritional status in adolescents was 7.6%, overweight was 12.1%, and obesity was 4.1% (Alamsyah *et al*., 2023). The prevalence of the population aged 15-24 years experiencing stress, anxiety, and depression in Indonesia is 9.0%, with women experiencing more mental emotional disorders than men (Dewi, 2017). Nutritional problems that occur in young adults in Indonesia are most often caused by inappropriate nutritional habits that lead to an imbalance between food intake and recommended nutritional needs. One type of inappropriate eating behavior is emotional eating. Emotional eating is a reaction to emotions that involves abnormal eating behaviors to cope with emotions. When you feel stressed, you usually eat not because you are hungry, but because you cannot cope with the stress you are experiencing (Shabira *et al*., 2024).

Stress increases in young adulthood because it is required to adjust to physical and emotional changes and overcome problems that occur in life. Young adults have a long transition period from adolescence to adulthood. This young adult period is generally aged 20-40 years. Students are generally aged between 20-25 years; therefore, students are included in the young adult category. Problems in these students can come from internal and external sources of stress, especially for students, where there are many additional sources of stress as one example is family and friendship problems (Novitasari & Kumala, 2023).

As is known, university students are adolescents who are growing up where, at this time, they are still in a state of emotional instability coupled with demands that come from lectures or from outside that trigger stress. When stressed, generally eating habits change which causes nutritional intake in the body to also change. The purpose of the study was to determine the relationship between stress and the nutritional status of university students.

Study conducted by (Liu *et al*., 2024) compared the daily nutritional intake of Haidian Foreign Language Academy students with the standard amount given by the Chinese Nutrition Society. The results showed that the calorie intake of male and

female students was significantly lower than the recommended standard amount. The study also found that students in Haiwai had unhealthy eating habits. Less than half of the students answered that they cared about the calories in the food they ate, but among those who answered 'yes', the percentage of girls was higher than that of boys. The main reason reported for those who cared was 'weight loss'. (Liu *et al*., 2024) Research on the relationship between stress and the nutritional status of students has been widely conducted in Indonesia. However, research on students at Islamic universities is still rare. There may be a discrepancy between stress and nutritional health as a result of Islamic food precepts, such as eating when hungry and quitting when full. In addition, students' knowledge of health is also related to diet and stress management. When students know that one of the factors that affects nutritional status is stress. Students will pay more attention to their lifestyle and diet to overcome stress in the future. Therefore, researchers are interested in conducting this research at the Faculty of Public Health, Universitas Islam Negeri Sumatera Utara, Medan, Indonesia.

METHOD

Population and Sample

The population in this study were students of the Faculty of Public Health, Universitas Islam Negeri Sumatera Utara. Sampling was carried out by random sampling, totaling 210 respondents. The random sampling technique was a technique for taking samples randomly from a population. This technique was based on the principle that each member of the population has an equal chance of being selected as a sample.

The inclusion criteria in this study were students of the Faculty of Public Health, Universitas Islam Negeri Sumatera Utara who agreed to fill out the informant consent and respondent questionnaires taken from semesters 2-8 of the Public Health Science study program.

Study Design

This research design used a cross-sectional design. This research was conducted at the Faculty of Public Health, Universitas Islam Negeri Sumatera Utara in July 2024.

Data Analysis

The research data collected were processed using SPSS version 21. With univariate tests with frequency analysis tests and bivariate with chi square tests. BMI categorization with BMI value classification <18.5 kg/m2 was underweight, BMI value 18.5-22.9 kg/m2 was normal and BMI value> 23 kg/m2 was overweight.

Data Collection

Collection of research data using the SRQ 29 (Self-Reporting Questionnaire) questionnaire developed by WHO. This SRQ 29 questionnaire has been tested for validity and reliability with good results. Data collection was carried out by trained lecturers and anthropometric measurements using scales and microtoises.

Ethical Clearance

The researcher stated that during the research process, the researcher did not violate research ethics with the ethics number 025.D/KEP-MLP/XI/2024.

RESULT

Univariate Analysis

Age, gender, semester, BMI, and stress were the characteristics of the respondents in this study. In table 1, the distribution of the characteristics of the respondents that have been presented can be seen.

Table 1. Respondent Distribution based on Characteristics

Respondent Characters	Frequency	Percentage (%)
Age		
17-20 years	141	67,2
21-25 years	69	32,8
Gender		
Male	16	7,6
Female	194	92,4
Semester		
Second	34	16,2
Third	3	1,4
Fourth	53	25,2
Sixth	97	46,2
Seventh	1	0,5
Eighth	22	10,5
IMT		
Underweight	45	21,4
Normal	95	45,2
Overweight	70	33,3
Stress Level		
High	160	76,2
Low	50	23,8

Based on Table 1, it can be seen that respondents aged 17-20 years were 141 (67.2) people. Female respondents were 194 (92.4%). The respondents who filled out the questionnaire the most were semester 6, 97 (46.2%). Respondents who were underweight were 45 (21.4%) people, and overweight were 70 (33.3%). Respondents with high stress levels were 160 (76.2%) people.

Bivariat Analysis

Table 2. The Relationship between Stress and Nutritional Status

Bivariate Analysis	Underweight	Normal	Overweight	P-Value
	N	N	N	
Stress				
High	37	62	61	0,003
Low	8	33	9	

Based on Table 2, it can be seen that students with underweight nutritional status and high stress levels are 37 people. Students with normal nutritional status and high stress levels are 62 people. While students with overweight nutritional status and high stress levels were 62 people. Based on the chi square test that has been conducted, the results of the p-value = 0.003 were obtained, which means that there was a relationship between stress and the nutritional status of students.

DISCUSSION

There were additional factors that can indirectly influence an individual's nutritional status, including psychological disorders such as depression, anxiety, or stress, which may manifest across all age groups, including children, adolescents, and adults (Wijayanti *et al*., 2019). In certain cases, excessive or insufficient food intake might stem from emotional states like stress, depression, or anxiety. If left unaddressed, these behaviors compromised health, particularly in terms of nutritional issues

(Lestari *et al*., 2021). Stress has been observed to induce two distinct dietary changes: some individuals exhibit increased food consumption during stressful periods, while others reduce their dietary intake (Larasati, 2018).

Table 2 presented the results of the chi-square test, which indicated a statistically significant association between stress and students' nutritional status (p = 0.003). This relationship was attributed to several factors, including irregular dietary patterns and psychological pressures that lead to behaviors such as overeating or appetite suppression.

When the body experiences stress—perceived as an internal threat, such as fear of weight gain or persistent concerns about body weight—the adrenal glands are triggered to release elevated cortisol levels as part of the natural physiological stress response. High cortisol levels stimulate the secretion of insulin, leptin, and neuropeptide Y (NPY), which activate hunger signals in the brain. This cascade promotes cravings for high-sugar and high-fat foods, drives motivation to consume calorie-dense "comfort foods," and facilitates the storage of excess calories as abdominal fat (Masdar *et al*., 2019).

These findings contrasted with those of syahrainy *et al*. (2023) whose study on the relationship between stress levels, fast-food consumption habits, and nutritional status among adolescents at Kalsan 1 Senior High School Yogyakarta reported no significant association (p-value = 0.627). This divergence suggested potential contextual or demographic variations influencing stress-related dietary behaviors (Syahrainy *et al*., 2023).

The primary distinction between this study and that of Syahrainy *et al*. lies in the derived p-value outcomes and the identified determinants of nutritional status. Syahrainy *et al*. (2023) attributed nutritional status among adolescents at Kalsan 1 Senior High School Yogyakarta to frequent consumption of fast food and school snacks. In contrast, the current study identified stress as a key factor influencing nutritional status, mediated by stress-induced emotional eating behaviors among university students.

Further contrasting findings emerged from the study by Novitasari & Kumala (2023), which examined the relationship between stress and nutritional status among students at Universitas Tarumanagara (UNTAR). Their results revealed no statistically significant association between stress and nutritional status (p-value = 0.185), with the stress group exhibiting 0.8 times the likelihood of abnormal nutritional status compared to non-stressed individuals (odds ratio = 0.8) (Novitasari & Kumala, 2023).

Similarly, a study conducted by Adinata *et al*. (2024) on stress levels and nutritional status among tenth-grade students at a vocational high school specializing in health found a significant relationship between stress levels and nutritional status (p = 0.037).

Stress indirectly influences nutritional status. It might lead to a loss of appetite, resulting in weight loss. Additionally, stress stimulated the thyroid gland to accelerate calorie burning, which caused the body to experience hunger more quickly (Adinata *et al*., 2024).

Under stressful conditions, there was an increase in eating behavior, which contributed to obesity. Stress led to weight gain by elevating blood cortisol levels, activating fat storage enzymes, and signaling hunger to the brain. Stress influenced eating behavior through various processes within the central nervous system and endocrine system, food choices, consumption patterns, and meal frequency. Higher stress levels

were associated with a greater tendency toward overeating. Excessive eating behavior was frequently employed as a coping mechanism to alleviate stress (Mayataqillah *et al*., 2023).

A key strength of this study lies in its ability to generate statistically robust findings and establish a foundation for further investigation into stress-related nutritional dynamics. However, a notable limitation is its narrowly focused examination of stress as the sole determinant of students' nutritional status, which represents a critical oversight given the multifactorial nature of nutritional health.

CONCLUSION AND SUGGESTION

This study concludes that there is a significant association between stress and nutritional status among university students. However, as research exclusively examined stress as a determinant of nutritional status, it is important to acknowledge that other confounding factors such as socioeconomic status, dietary habits, or genetic predispositions may confound or mediate this relationship. Future studies are recommended to incorporate participants from varied socioeconomic backgrounds to enhance the generalizability of findings and explore potential interactions between stress and broader sociodemographic variables in shaping nutritional outcomes.

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AUTHOR CINTRIBUTION

Nurhazizah Br Said was responsible for participants' recruitment and data collection. Zata Ismah data processing and statistical analysis. Siti Aisyah was responsible for the improvement of the article.

CONFLICT OF INTEREST

The authors declare there are no conflicts of interest.

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