



Research Article

Stress Levels, Macronutrient Intake, and Physical Activity and Their Relation to Nutritional Status in New Students

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ABSTRACT

New students are prone to lifestyle changes, such as increased stress, changes in diet, and decreased physical activity, which can affect their nutritional status. Nutritional problems can affect the health and academic achievement of the students. This study aimed to examine the correlation of the nutritional status of new students with the stress levels, macronutrient intake, and physical activity. With a cross-sectional design, this study is an analytical observational study. The population consisted of all 263 new students at the Faculty of Health. The sample consisted of 73 students, selected using proportional stratified random sampling. Stress level was measured using the DASS-21 questionnaire, nutrient intake through a 24-hour food recall, physical activity using the IPAQ-SF, and nutritional status through measurement of Body Mass Index. Data were analysed using the Spearman correlation test. The results showed severe stress (28.8%), normal carbohydrate intake (27.4%), moderate protein deficit (34.2%), mild fat deficit (35.6%), moderate activity (53.4%), and normal nutritional status (60.3%). This study found a relationship between stress level and nutritional status ($p=0.002$, $r=-0.349$), macronutrient intake (carbohydrate, protein, fat) with nutritional status respectively ($p=0.007$, $r=0.315$), ($p=0.000$, $r=0.595$), ($p=0.000$, $r=0.481$), and physical activity has a relationship with nutritional status ($p=0.005$, $r=-0.323$). In conclusion, there is a relationship between stress levels, macronutrient intake, and physical activity with nutritional status. The strongest relationship to nutritional status is macronutrient intake, especially protein and fat. It is expected that new students possess good stress management skills, a balanced nutritional intake, and engage in sufficient physical activity.

Keywords: Nutrients, Nutritional Status, Physical Activity, Stress

INTRODUCTION

Nutrition is a rapidly growing public health concern in both developed and developing countries worldwide. One of the nutritional problems that occurs in Indonesia is obesity (Thamrin et al., 2022). Obesity among first-year-students is a serious concern, given the significant lifestyle changes involved in transitioning from school to college (Chen et al., 2020). These nutritional



problems can impact students' education, ranging from impaired learning, loss of focus, and stress caused by unbalanced dietary intake and low physical activity (Aziz et al., 2020). According to Hulukati & Djibran (2018), they are included in the early adulthood category. At this age, a person enters college as a key step toward adulthood. The transition to a new student often leads to lifestyle changes that can trigger various nutritional problems, particularly obesity, which is a significant concern (Brautigam Ewe et al., 2021). Nutritional status is a body condition resulting from food intake and nutrients consumed to meet energy needs, support growth and development, repair tissues, and regulate metabolic processes (Mutiaraningrum et al., 2023). Students are in the late adolescence to young adulthood age group, during which nutritional status is particularly important.

According to WHO data from 2022, around 2.5 billion people who are 18 years of age or older suffer from obesity. About 13% of the world's adult population is fat, while 39% of individuals are overweight (Organization, 2022). Based on the Basic Health Research (Riskesdas) in 2018, the prevalence of nutritional status among individuals aged 19 years showed that 20.7% were undernourished and 15.5% were overnourished. In the 20-24 age group, 15.8% were undernourished, and 20.5% were overnourished (Kemenkes RI, 2019). IHS noted that the prevalence of obesity reached 23.4% (Kemenkes RI, 2024). The district/city with the highest prevalence of obesity in the population ≥ 15 years in 2023 is Surabaya City (Public Health Office of East Java, 2023).

One factor contributing to students' nutritional issues is stress (Pascoe et al., 2020). Students often experience stress during their activities. It is known that the prevalence of students in the world who experience stress is 38-71%, while in Asia, it is 39.6-61.3%. Meanwhile, the prevalence of students who experience stress in Indonesia itself is found to be 36.7-71.6% (Nabilah et al., 2024). Students who suffer from stress experience adverse effects that interfere with learning and affect performance. Students who experience extreme stress or depression need serious attention (Widayati et al., 2024). Based on the DASS-21 questionnaire conducted by Surabaya Nahdlatul Ulama University in 2024 among new students, it was found that 47.1% of new students in the Faculty of Health are experiencing stress. Increased creativity is one of the benefits of academic stress, and as long as the feelings are kept within the bounds of personal capacity, they can spur self-development. The unfavourable effects of learning stress can lead to alcohol consumption, food problems, and sleep difficulties (Marciello et al., 2020). According to Tran et al. (2020), effective stress management is needed to mitigate the effects of stress. Stress management can be achieved through non-pharmacological therapies, which are considered more effective because they do not cause side effects, such as progressive muscle relaxation, guided imagery, massage, yoga, Benson relaxation, and aromatherapy (Shayani & Maraes, 2023). Students can use a variety of ways to cope with stress, including eating (Firdausy et al., 2022). Eating is used to relieve heaviness, which can lead to emotional eating and affect nutritional status. If nutrient intake is insufficient and unbalanced, it will impact the body's metabolism and lead to dietary problems. Similarly, excessive nutrient intake can lead to health problems, including increased blood pressure, blood sugar, and lipid profiles such as triglycerides, cholesterol, LDL, HDL, and VLDL (Jasim et al., 2022).

In addition to nutrient intake, physical activity patterns are another factor to consider when determining students' nutritional status. Adequate physical activity is vital for maintaining energy balance, preventing excess fat accumulation, and increasing metabolic rate. Students begin to be more active and take breaks during their college years, which affects physical activity (Dhuli et al., 2022). The convenience of technological advances leads students to a sedentary lifestyle, namely sitting, watching TV, and using high-tech equipment such as computers, which causes less

movement (Yuliana Asnita et al., 2020). Safdar et al. (2025) found that 80.6% have less physical activity. This physical activity helps to burn energy. If energy intake is excessive and physical activity is unbalanced, it will increase body weight. Conversely, if the calories burned are high and calorie intake is low, it will cause a calorie deficit and lead to weight loss (Kim, 2020). Research conducted by Hamalding et al. (2019) shows that the daily routines of overweight and obese adults are linked to their low levels of activity. The results of Periselo (2024) show that the nutritional status of students at Stikes Bhakti Pertiwi Luwu Raya Palopo is correlated with their intake of fat, protein, and carbohydrates. Prior research has mostly focused on the nutritional status of obesity and on physical activity. Still, it hasn't examined the relationship between stress, macronutrient intake, physical activity, and nutritional status among first-year students. Based on the background of the foregoing concerns, the researcher is interested in evaluating the association between stress levels, macronutrient consumption, and physical activity with nutritional status in new students of the Faculty of Health, Nahdlatul Ulama University Surabaya.

MATERIAL AND METHODS

This study employed a cross-sectional design and was an analytical observational study, which obtained an ethical permit from Universitas Muhammadiyah Lamongan, numbered 101/EC/KEPK S1/03/2025. The study's population consisted of 263 first-year students enrolled in the Faculty of Health at Universitas Nahdlatul Ulama Surabaya for the 2024–2025 academic year. The inclusion criteria of being a new student enrolled in the 2024–2025 academic year, willing to participate in the study, and free from infectious or chronic diseases. A sample of 73 students was obtained using the Slovin sample size formula and the proportional stratified random sampling method. The research was conducted from February to July 2025. In practice, observations were made by directly measuring the nutritional status of respondents using anthropometry, namely the Body Mass Index (BMI) threshold for Indonesia based on Minister of Health Regulation No. 41 of 2014, with the categories of very thin if BMI < 17.0, thin if BMI 17 - < 18.5, normal if BMI is 18.5 – 25.0, overweight if BMI is > 25.0 – 27.0, obese if BMI is > 27.0 (Mufidah & Soeyono, 2021).

Stress levels were measured using the Depression Anxiety Stress Scale-21 (DASS-21) questionnaire developed by Lovibond and Lovibond (1995). This scale was chosen because it consists of short, easy-to-understand questions, making it suitable for adolescents and young adults, especially those aged 16–20 years. In the DASS-21, 7 items are used to measure stress levels. Respondents are asked to answer each statement on a 4-point Likert scale (0–3), indicating how often they experienced the condition in question during the past week. After all the scores on the stress items are added, the result is multiplied by 2 to obtain the final score. This score is then categorized into five levels of stress as follows: severe stress if the score is ≥ 34 , heavy stress if the score is 26–33, moderate stress if the score is 19–25, mild stress if the score is 15–18, and normal if the score is 0–14 (Lovibond & Lovibond, 1995). Physical activity is assessed using the International Physical Activity Questionnaire - Short Form (IPAQ-SF).

The International Physical Activity Questionnaire (IPAQ) is an instrument used to measure physical activity in adults aged 15–69 years, with categories of low physical activity < 600 MET minutes/week, moderate physical activity ≥ 600 –1499 MET minutes/week, and high physical activity ≥ 1500 MET minutes/week (Dharmansyah & Budiana, 2021). IPAQ has been validated in 14 centres across 12 countries and has been internationally standardized with a validity coefficient ($r=0.40$) and a reliability of 0.70–0.87 (Handayani & Fithroni, 2022). To measure macro nutrient intake (carbohydrates, protein, and fat) using the classification criteria according to the Ministry of

Health (1996), namely severe deficiency (<70% RDA), moderate deficiency (70–79%), mild deficiency (80–89%), normal (90–119%), and excess ($\geq 120\%$) (Himmaya et al., 2025). Macronutrient intake was assessed using a 24-hour food recall interview method, conducted during one weekday and one weekend day. The data will be analysed using SPSS 25 with Spearman's rank correlation test (non-normally distributed data) at the 95% confidence level.

RESULTS AND DISCUSSION

The attributes of students

General research data describes the research respondents, including age, gender, and study program. 73 respondents were successfully collected; this meets the required sample size. An overview of the general characteristics of the research respondents is presented in Table 1.

Table 1. Distribution of Student Features

Features	n	%
Gender		
Male	9	12.3
Female	64	87.7
Age (Years)		
19-21	63	86.3
22-24	10	13.7
Study program		
S1 Nutrition	23	31.5
S1 Public Health	21	28.8
D4 Health Analyst	16	21.9
D4 Occupational Safety and Health	13	17.8

Table 1 provides information on the characteristics of 73 respondents by academic program, age, and gender. There were 64 female respondents (87.7%), and 9 men (12.3%). Age-wise, 63 respondents (86.3%) were between 19 and 29, while 10 respondents (13.7%) were between 16 and 18. According to this, the majority of incoming students at UNUSA's Faculty of Health are categorized as early adults who have begun the process of moving from youth to adulthood. In the study programs, respondents are divided into four majors. S1 Nutrition study program with 23 students (31.5%), S1 Public Health 21 students (28.8%), D4 Health Analyst 16 students (21.9%), and D4 Occupational Safety and Health 13 students (17.8%).

Relationship between Stress Level and Nutritional Status

A cross-tabulation table showing the correlation between new students' stress levels and nutritional health at Universitas Nahdlatul Ulama Surabaya is shown below.

Table 2. Relationship Between Stress Level and Student Nutritional Health

Stress Levels		Nutritional Status										Total	
		Very Thin		Skinny		Normal		Over weight		Obesity			
		n	%	n	%	n	%	n	%	n	%	n	%
Very Severe Stress	Severe	0	0.0	1	8.3	3	25.0	1	8.2	7	58.3	12	100.0
Severe Stress		4	19.0	2	9.5	4	19.0	3	14.3	8	38.1	21	100.0
Moderate Stress		0	0.0	1	10.0	9	90.0	0	0.0	0	0.0	10	100.0
Mild Stress		0	0.0	1	9.1	9	81.1	0	0.0	1	9.1	11	100.0
Normal		0	0.0	0	0.0	19	100.0	0	0.0	0	0.0	19	100.0
<i>p-value = 0.002 < 0.05</i>													

Correlation Coefficient = - 0.349

According to Table 2's statistics, students who experience incredibly high levels of stress are more likely to be obese (58.3%) and overweight (8.2%) in terms of their nutritional status, whereas in the group experiencing severe stress, 38.1% are likewise obese and 14.3% are overweight. In comparison, the majority of children with mild to moderate stress showed the same pattern, while all students who did not regularly experience stress had a normal nutritional status (100%). The results indicated a strong correlation between nutritional status and stress level ($p = 0.002$; $r = -0.349$). The higher the stress level, the greater the proportion of students who are overweight or obese. In contrast, students without stress were all at a normal nutritional status. This finding indicates that stress contributes to nutritional imbalance, possibly by altering eating behaviour.

Based on the results of the study, there is a relationship between stress levels and nutritional status, and there is a tendency that respondents who experience stress tend to have a normal nutritional status, and move more towards obesity. The reason for this is that the majority of new students who suffer from anxiety do so by eating, primarily by consuming foods high in fat and sugar, like sugar-sweetened beverages and sweet snacks, according to the results of interviews with respondents. Some students felt calmer after a large meal, even though they were not hungry. On the other hand, others reported losing their appetite under stress, leading to poor nutritional intake.

The Association Between College Students' Nutritional Status and Their Intake of Carbohydrates

The following is a cross-tabulation of the relationship between carbohydrate intake and the nutritional status of the new students in the Faculty of Health, Universitas Nahdlatul Ulama Surabaya.

Table 3. The Connection Between Students' Nutritional Status and Their Intake of Carbohydrates

Carbohydrate Intake	Nutritional Status										Total	
	Very Thin		Skinny		Normal		Overweight		Obesity			
	n	%	n	%	n	%	n	%	n	%	n	%
	Severe Deficit	1	12.5	3	37.5	3	37.5	0	0.0	1	12.5	8
Moderate Deficit	1	8.3	0	0.0	6	50.0	2	16.7	3	25.0	12	100.0
Mild Deficit	0	0.0	1	5.6	15	83.3	1	5.6	1	5.6	18	100.0
Normal	1	5.0	1	5.0	17	85.0	0	0.0	1	5.0	20	100.0
More	1	6.7	0	0.0	3	20.0	1	6.7	10	66.7	15	100.0

$p\text{-value} = 0,007 < 0.05$

Correlation Coefficient = 0.315

Table 3 shows that most respondents in the higher carbohydrate intake category, as many as 66.7% of respondents, were classified as obese. However, only 37.5% of respondents had normal nutritional status; over half were in the severe deficit category, and only 12.5 % were categorized as extremely thin. In contrast, 85% of respondents in the normal carbohydrate intake category had normal nutritional status. This suggests that carbohydrate intake that is excessive or low can affect a person's nutritional status, with excessive intake tending to be associated with obesity and severe deficits tending to lead to poorer nutritional status, such as very thin or undernourished. In contrast,

a balanced carbohydrate intake favours a healthy nutritional status. The analysis indicated a strong correlation between university students' nutritional status and their carbohydrate intake ($p = 0.007$; $r = 0.315$). A larger percentage of students with an appropriate dietary status will be those with a more balanced carbohydrate intake. This research suggests that adequate carbohydrate intake is crucial for maintaining students' nutritional stability, and that imbalances in intake can lead to both undernutrition and overnutrition.

It seems that students who consume a lot of carbs typically have an obese nutritional status, according to studies conducted on incoming students at the UNUSA Faculty of Health. However, only a small percentage of pupils who consume minimal carbohydrates have a normal nutritional status, and some of them are considered obese or extremely skinny. Students who consume the correct amount of carbohydrates, on the other hand, typically have normal nutrition. A statistical investigation revealed a substantial correlation between nutritional status and carbohydrate intake. Despite this link's weakness, the findings showed that nutritional status increased with carbohydrate intake.

The Connection Between Students' Nutritional Status and Their Intake of Protein

The following table shows the relationship between protein intake and the nutritional status of new students.

Table 4. The Connection Between Students' Nutritional Status and Their Intake of Protein

Protein Intake	Nutritional Status										Total	
	Very Thin		Skinny		Normal		Overweight		Obesity		n	%
	n	%	n	%	n	%	n	%	n	%		
Severe Deficit	1	33.3	2	66.7	0	0.0	0	0.0	0	0.0	3	100.0
Moderate Deficit	1	4.0	2	8.0	22	88.0	0	0.0	0	0.0	25	100.0
Mild Deficit	1	4.5	0	0.0	16	72.7	2	9.1	3	13.6	22	100.0
Normal	1	5.9	1	5.9	5	29.4	2	11.8	8	47.1	17	100.0
More	0	0.0	0	0.0	1	16.7	0	0.0	5	83.3	6	100.0

$p\text{-value} = 0.000 < 0.05$

$\text{Correlation Coefficient} = 0.595$

Table 4 shows that almost all respondents in the group with higher protein intake (83%), were in the obese category. Meanwhile, most respondents in the group had severe protein intake deficit, 66.7% were classified as thin, and none had a normal nutritional status. Furthermore, 88% of responders in the group with a modest protein intake shortfall had normal nutritional status. The results of the investigation indicated a strong correlation between students' nutritional status and protein intake. A correlation coefficient value of 0.595 and a p-value of 0.000, which is less than 0.05, show that there is a positive association with a respectable, strong relationship. This implies that pupils' nutritional status improves with increased protein intake.

A study of first-year students at the UNUSA Faculty of Health found that most students who consumed excessive protein tended to have an obese nutritional status. In contrast, students who experienced severe protein deficits were generally underweight, and none had a normal nutritional status. Meanwhile, most students with moderate protein deficits continued to show normal nutritional status. These conclusions were supported by the statistical analysis, which revealed a strong correlation between protein consumption and nutritional status. The correlation was positive and moderately to strongly robust, suggesting that nutritional status improves with increased protein intake.

The Connection Between College Students' Nutritional Status and Their Intake of Fat

Table 5 shows the cross-tabulation of the relationship between fat intake and the nutritional status of new students.

Table 5. The Connection Between College Students' Nutritional Status and Their Intake of Fat

Fat Intake	Nutritional Status										Total	
	Very Thin		Skinny		Normal		Overweight		Obesity		n	%
	n	%	n	%	n	%	n	%	n	%		
Severe Deficit	0	0.0	2	66.7	0	0.0	0	0.0	1	33.3	3	100.0
Moderate Deficit	2	11.8	1	5.9	14	82.4	0	0.0	0	0.0	17	100.0
Mild Deficit	0	0.0	1	3.8	22	84.6	0	0.0	3	11.5	26	100.0
Normal	1	7.1	1	7.1	6	42.9	2	14.3	4	28.6	14	100.0
More	1	7.7	0	0.0	2	15.4	2	15.4	8	61.5	13	100.0

p-value = 0.000 < 0.05
Correlation Coefficient = 0.481

Table 5 shows that most respondents in the group with higher fat intake (61.5%) were classified as obese, while only 15.4% had a normal nutritional status. In contrast, among respondents with moderate deficits in fat intake, 82.4% had normal nutritional status, and none were obese. Meanwhile, most respondents in the severe deficit group, as many as 66.7% of respondents, had a lean dietary status, and almost half, only 33.3% of respondents, had an obese nutritional status. The analysis's findings indicate a strong correlation between pupils' nutritional state and their fat intake. A p-value of 0.000 (less than 0.05) and a correlation coefficient of 0.481 indicate a very significant positive link, supporting this. This implies that kids' nutritional status increases with their fat intake. This suggests that many students still need a better understanding of the role of fat as a source of energy and support for body functions. Hence, their intake remains balanced, neither excessive nor deficient. If uneven fat consumption continues, it may result in long-term health issues such as an elevated risk of heart disease, obesity, and other metabolic diseases (Zamzam et al., 2024). However, eating a few healthy fats can affect how well the brain works, how well fat-soluble vitamins are absorbed, and how important hormones are produced.

If fat intake is not adequately addressed, students are at risk of fatigue, impaired concentration, and a decreased immune system, which can affect their quality of life and academic performance.

This study supports the findings of Liu et al. (2021), which show that excess fat intake positively correlates with increased Body Mass Index (BMI) in college students. Students who ate high-fat foods, such as fried foods and fast food, more than three times a week were more likely to be overweight, according to the study. This is due to the high-calorie content in fatty foods, which, if not accompanied by adequate physical activity, can lead to excess energy and accumulation as body fat. In addition, research by Arslan et al. (2023) explains that students' eating habits have changed since they started attending lectures, and they now rely more frequently on foods high in fat but low in fibre. These results reinforce the findings of this study that fat plays an essential role in nutritional status, and excessive fat consumption can increase the risk of obesity or overnutrition. In contrast, respondents with low fat intake tended to lose weight and fall underweight, especially if their total energy intake from other macronutrients was also low.

These findings suggest the importance of nutrition education regarding the role and appropriate amount of fat intake among university students. Campuses can play an active role through nutrition counselling, providing healthy food in the canteen, and integrating balanced

nutrition materials in the new student development program. Preventive approaches involving nutritional status screening and food selection training can help reduce the prevalence of obesity or undernutrition. This endeavour will assist students in preserving their nutritional status, limiting their intake of fat, and lowering their future risk of developing non-communicable diseases. It can be concluded that macronutrient intake (carbohydrates, protein, and fat) is related to nutritional status.

The Connection Between Dietary Status and Physical Activity

The following is a cross-tabulation of the relationship between physical activity and the nutritional status of new students.

Table 6: The Connection Between Dietary Status and Physical Activity

Physical Activity	Nutritional Status										Total	
	Very Thin		Skinny		Normal		Overweight		Obesity		n	%
	n	%	n	%	n	%	n	%	n	%		
Low	4	21.1	0	0.0	3	15.8	0	0.0	12	63.2	19	100.0
Medium	0	0.0	4	10.3	27	69.2	4	10.3	4	10.3	39	100.0
High	0	0.0	1	6.7	14	93.3	0	0.0	0	0.0	15	100.0

p-value = 0.005 < 0.05
Correlation Coefficient = - 0.323

Based on the data in Table 6, it is known that almost half of the respondents in the high physical activity group (93.3%) have normal nutritional status, and none are obese. Meanwhile, most respondents in the low physical activity group, as many as 63.2% of respondents had obese nutritional status and a small proportion of respondents only 15.8% had normal nutritional status. The study's findings suggest a connection between students' nutritional condition and their degree of physical activity. High physical activity respondents typically exhibit appropriate nutritional health, demonstrating the critical role physical activity plays in maintaining the balance between the body's energy expenditure and intake. When physical activity is sufficient, the calories from food are burned optimally, so they are not deposited as body fat. Conversely, students with low physical activity tend to experience a build-up of unburned energy, which can then lead to overweight or obesity.

The analysis's findings indicate that pupils' nutritional status and physical activity are significantly correlated. A *p*-value of 0.005, which is less than 0.05, indicates this. With a correlation coefficient value of -0.323, the association appears to be weak and negative. This implies that kids' nutritional status will decline as they engage in less physical activity. Conversely, the lower the physical activity deficit, the obese the nutritional status. This negative relationship indicates that nutritional status tends to change with physical activity, though the correlation is not strong. This finding suggests that higher physical activity correlates with normal nutritional status; conversely, low physical activity increases the risks of excessive dietary intake, such as obesity.

Maintaining nutritional status and energy balance requires physical activity. During the transition to college, changes in routine and lifestyle often affect physical activity levels, which in turn impact nutritional status (Shao et al., 2021). A healthy body composition and calorie burning are achieved by adequate physical activity, whereas sedentary lifestyles lead to the buildup of body fat. Therefore, monitoring first-year students' physical activity is an essential step towards understanding trends in nutritional status. The conclusions of this investigation are consistent with those of Yuliani et al. (2022), who found that physical activity significantly influences students' nutritional status. The study explained that physically active students tend to maintain an ideal body

weight, compared to students whose lifestyles tend to be sedentary (lack of physical activity). Another study by Miller & Hartman (2020) also supports this finding, showing that low physical activity levels contribute to an increased risk of obesity among first-year students. Students with low physical activity showed a greater tendency to be obese, with only a small proportion of them having a normal nutritional status.

According to research by Nafia et al. (2021), first-year students who lead less active lifestyles are more likely to be obese than those who lead active lifestyles. The study explained that the transition from school to college led to changes in students' physical activity patterns, with time previously devoted to physical activities replaced by academic activities and the use of gadgets. An imbalance between energy intake and expenditure resulting from this inactivity leads to an increase in body weight (Bourdier et al., 2023). Students who rarely do physical activity more than three times a week are recorded to have a higher BMI percentage and tend to fall into the category of fat to obesity. Therefore, there is a connection between low levels of physical activity and nutritional status.

These findings suggest the need for active lifestyle-based interventions on campus, especially for first-year students. Campuses can encourage physical activity by providing sports facilities, regular exercise programs, healthy walking campaigns, and student fitness clubs. In addition, it is important to align nutrition education with physical activity promotion so that students focus not only on healthy food consumption but also on balanced energy expenditure. This holistic approach is expected to reduce obesity rates and improve students' overall quality of life and academic productivity. It can be concluded that there is a relationship between physical activity and nutritional status.

CONCLUSION AND SUGGESTION

The study found that the majority of new health students were under a lot of stress, which may affect their nutritional balance. In addition, most respondents had macronutrient intake in the deficit category, particularly for protein and fat, indicating that daily nutritional needs were not met. Stress levels, macronutrient intake, and physical exercise are all related to students' nutritional status. The negative relationship indicates that increased stress levels and low physical activity contribute to an imbalance in nutritional status. This study suggests that it opens the door to developing more holistic campus-based intervention programs, such as nutrition education, stress management, and increased awareness of integrated physical activity. It is anticipated that future studies will examine additional environmental and behavioural elements that affect university students' nutritional health in greater depth.

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CONFLICT OF INTEREST

This research has no conflicts of interest.

REFERENCES

Arslan, N., Aslan Ceylan, J., & Hatipoğlu, A. (2023). The relationship of fast food consumption with sociodemographic factors, body mass index and dietary habits among university students.

- Nutrition & Food Science*, 53(1), 112–123. <https://doi.org/https://doi.org/10.1108/NFS-01-2022-0003>
- Aziz, A., Mahboob, U., & Sethi, A. (2020). What problems make students struggle during their undergraduate medical education? A qualitative exploratory study. *Pakistan Journal of Medical Sciences*, 36(5), 1020. <https://doi.org/10.12669/pjms.36.5.2267>
- Bourdier, P., Simon, C., Bessesen, D. H., Blanc, S., & Bergouignan, A. (2023). The role of physical activity in the regulation of body weight: The overlooked contribution of light physical activity and sedentary behaviors. *Obesity Reviews*, 24(2), e13528. <https://doi.org/https://doi.org/10.1111/obr.13528>
- Brautigam Ewe, M., Hilding, C., Mansson, J., & Lydell, M. (2021). Primary care nurses' perceptions and experiences of patients being overweight or obese as well as visions and attitudes about working with lifestyle issues: a qualitative interview study. *BMC Nursing*, 20(1), 170. <https://doi.org/10.1186/s12912-021-00685-1>
- Chen, Y., Liu, X., Yan, N., Jia, W., Fan, Y., Yan, H., Ma, L., & Ma, L. (2020). Higher academic stress was associated with increased risk of overweight and obesity among college students in China. *International Journal of Environmental Research and Public Health*, 17(15), 5559.
- Dharmansyah, D., & Budiana, D. (2021). *Indonesian Adaptation of The International Physical Activity Questionnaire (IPAQ): Psychometric Properties*.
- Dhuli, K., Naureen, Z., Medori, M. C., Fioretti, F., Caruso, P., Perrone, M. A., Nodari, S., Manganotti, P., Xhufi, S., & Bushati, M. (2022). Physical activity for health. *Journal of Preventive Medicine and Hygiene*, 63(2 Suppl 3), E150. <https://doi.org/10.15167/2421-4248/jpmh2022.63.2S3.2756>
- Dinas Kesehatan Jawa Timur. (2018). *Profil kesehatan Provinsi Jawa Timur tahun 2018*.
- Firdausy, A. I., Amanda, K. A., Alfaeni, S. W., Amalia, N., Rahmani, N. A., & Nasution, A. S. (2022). Hubungan Pola Makan Dan Stres Dengan Kejadian Gastritis Pada Mahasiswa Fakultas Ilmu Kesehatan Universitas Ibn Khaldun. *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, 3(2), 75–86.
- Handayani, F., & Fithroni, H. (2022). Hubungan tingkat aktivitas fisik terhadap tingkat stres mahasiswa akhir Fakultas Ilmu Olahraga Universitas Negeri Surabaya. *Jurnal Kesehatan Olahraga*, 10(3), 131–138.
- Himmaya, A., Fitri, D., & Zakaria, A. (2025). Perbandingan Kecukupan Asupan Energi Dan Protein Pada Mahasiswa Fakultas Kedokteran Universitas Islam Malang Selama Puasa Ramadhan. *Media Bina Ilmiah*, 20(2), 7117–7130.
- Hulukati, W., & Djibrin, M. R. (2018). Analisis Tugas Perkembangan Mahasiswa Fakultas Ilmu Pendidikan Universitas Negeri Gorontalo. *Bikotetik (Bimbingan Dan Konseling Teori Dan Praktik)*, 2(1), 73. <https://doi.org/10.26740/bikotetik.v2n1.p73-80>
- Jasim, O. H., Mahmood, M. M., & Ad'hiah, A. H. (2022). Significance of lipid profile parameters in predicting pre-diabetes. *Archives of Razi Institute*, 77(1), 277. <https://doi.org/https://doi.org/10.22092/ARI.2021.356465.1846>
- Kemenkes RI. (2019). *Laporan Nasional Riskesdas 2018*. Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan.
- Kemenkes RI. (2024). *Survei Kesehatan Indonesia (SKI) 2023*. Badan Kebijakan Pembangunan Kesehatan.
- Kim, J. Y. (2020). Optimal diet strategies for weight loss and weight loss maintenance. *Journal of Obesity & Metabolic Syndrome*, 30(1), 20. <https://doi.org/10.7570/jomes20065>

- Liu, W., Yuan, Q., Zeng, N., McDonough, D. J., Tao, K., Peng, Q., & Gao, Z. (2021). Relationships between college students' sedentary behavior, sleep quality, and body mass index. *International Journal of Environmental Research and Public Health*, 18(8), 3946. <https://doi.org/https://doi.org/10.3390/ijerph18083946>
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335–343.
- Marciello, F., Monteleone, A. M., Cascino, G., Patriciello, G., Pelleggrino, F., & Fiorenza, G. (2020). Early traumatic experiences and eating disorders: A focus on the endogenous stress response system. *Journal of Psychopathology*, 26(1), 77–84. <https://doi.org/10.36148/2284-0249-364>
- Miller, K. G., & Hartman, J. M. (2020). Influence of physical activity on weight status during the first year of college. *Journal of American College Health*, 68(3), 258–262. <https://doi.org/https://doi.org/10.1080/07448481.2018.1539398>
- Mufidah, R., & Soeyono, R. D. (2021). Pola makan, aktivitas fisik, dan durasi tidur terhadap status gizi mahasiswa program studi gizi Unesa. *Gizi Unesa*, 1(1), 60–64.
- Mutiaraningrum, I., Herdiani, N., Asih, A. Y. P., & Fasya, A. H. Z. (2023). Pengaruh Asupan Energi dan Aktivitas Fisik Terhadap Status Gizi Santri Putri di Pondok Pesantren Islam At-Tauhid Surabaya. *Jurnal Promotif Preventif*, 6(6), 821–828. <https://doi.org/https://doi.org/10.47650/jpp.v6i6.1013>
- Nabilah, C., Fitrianur, W. L., Widiyawati, W., & Zuhroh, D. F. (2024). Self Help Groups as a Support System: Their Influence on Stress Levels in New Nursing Students. *INNOVATION RESEARCH JOURNAL*, 5(2), 152–161.
- Nafia, Z. I., Shodiq, I. Z., & Handayani, L. (2021). Nutritional status of children under five years in the work area of Puskesmas Cipadung. *Disease Prevention and Public Health Journal*, 15(2), 125. <https://doi.org/10.12928/dpphj.v15i2.4748>
- Organization, W. H. (2022). WHO European regional obesity report 2022. In *WHO European Regional Obesity Report 2022*.
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112. <https://doi.org/10.1080/02673843.2019.1596823>
- Periselo, H. (2024). Hubungan asupan zat gizi makro dengan status gizi mahasiswa Program Studi S1 Gizi Stikes Bhakti Pertiwi Luwu Raya Palopo tahun 2024. *Jurnal Kesehatan Luwu Raya*, 11(1), 61–69. <https://doi.org/http://www.jurnalstikesluwuraya.ac.id/index.php/eq/article/view/260>
- Safdar, N., Ali, Q., Zahra, A., & Hussain, T. (2025). Physical inactivity among university students in Pakistan. *Kybernetes*, 54(4), 2520–2534. <https://doi.org/https://doi.org/10.1108/K-04-2023-0593>
- Shao, T., Verma, H. K., Pande, B., Costanzo, V., Ye, W., Cai, Y., & Bhaskar, L. (2021). Physical activity and nutritional influence on immune function: an important strategy to improve immunity and health status. *Frontiers in Physiology*, 12, 751374. <https://doi.org/https://doi.org/10.3389/fphys.2021.751374>
- Shayani, L. A., & Maraes, V. R. F. da S. (2023). Manual and alternative therapies as non-pharmacological interventions for pain and stress control in newborns: a systematic review. *World Journal of Pediatrics*, 19(1), 35–47.

- Thamrin, S. A., Arsyad, D. S., Kuswanto, H., Lawi, A., & Arundhana, A. I. (2022). Obesity Risk-Factor Variation Based on Island Clusters: A Secondary Analysis of Indonesian Basic Health Research 2018. *Nutrients*, 14(5), 971. <https://doi.org/10.3390/nu14050971>
- Tran, C. T. H., Tran, H. T. M., Nguyen, H. T. N., Mach, D. N., Phan, H. S. P., & Mujtaba, B. G. (2020). Stress management in the modern workplace and the role of human resource professionals. *Business Ethics and Leadership*, 4(2), 26–40. [https://doi.org/http://doi.org/10.21272/bel.4\(2\).26-40.2020](https://doi.org/http://doi.org/10.21272/bel.4(2).26-40.2020)
- Widayati, R. W., Guterres, J. D. C., & Sucipto, A. (2024). Efektivitas Kombinasi Terapi Benson dan Aromaterapi terhadap Penurunan Stres Akademik pada Mahasiswa Keperawatan Universitas Respati Yogyakarta. *Media Informasi*, 20(2), 36–42. <https://doi.org/10.37160/mijournal.v20i2.636>
- Yuliana Asnita, Evawany Yunita Aritonang, & Zulhaida Lubis. (2020). The Effect of Sedentary Lifestyle on the Incidence of Obesity on Adolescents in SMUN 7 Banda Aceh. *Britain International of Exact Sciences (BIOEx) Journal*, 2(1), 53–60. <https://doi.org/10.33258/bioex.v2i1.118>
- Yuliani, K., Putri, P. H., Nuriannisa, F., Herdiani, N., Nisak, Z. S., & Fatmawati, Y. (2022). Senam Aerobik Efektif Menurunkan Indeks Massa Tubuh (IMT) dan Stres pada Mahasiswi Overweight dan Obesitas. *Journal of Islamic Medicine*, 6(2), 92–98.
- Zamzam, M. Z., Herdiani, N., & Kurniavie, L. E. (2024). Nutritional status, individual traits, and disease incidence at An-Nur Boarding School, Surabaya. *Medical Technology and Public Health Journal*, 8(1), 91–97. <https://doi.org/https://doi.org/10.33086/mtphj.v8i1.5231>