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# The Relationship between Nutritional Intake, Physical Activity and Stress Level with Nutritional Status of Clinical Students of the Faculty of Medicine, Cenderawasih University

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**Abstract**

Data from the WHO shows that around 49% of people in the world are overweight or obese. In 2018 in Indonesia, the prevalence of obesity for adults was 24.4%, and the prevalence of weight was more than 14.9%. This study examines the relationship between nutritional intake, physical activity, and stress levels with the nutritional status of Kinik students of the Faculty of Medicine, Cenderawasih University at the Jayapura Regional General Hospital. This study uses a quantitative design with a cross-sectional study approach. The population is 164 students of the Faculty of Medicine, Cenderawasih University who are undergoing clinical clerkship. The sample was 80 people who were taken by the Purposive Sampling Technique. The data were analyzed by the Chi-Square Test, the Prevalence Ratio Test, and the Logistic Regression Test. The results showed that the relationship between nutritional intake and the nutritional status of students was significant (p-value = 0.040, RP = 1.195, CI 95% (1.122-3.301).

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Physical activity was not substantial to the nutritional status of students (p-value = 0.239, RP=1.55 CI 95% (0.82-2.950). The stress level was not significant with the nutritional status of students (p=0.386, RP= 1.445, CI 95% (0.802 – 2.639). The results of the multivariate analysis showed that the dominant factor related to the nutritional status of students was the nutritional intake variable with p value=0.024 OR=0.322 CI 95% (0.121-0.860).

***Keywords:*** Nutritional Intake; Physical Activity; Stress Level; Nutritional Status; Students.

## 1. Introduction

The whole world is currently facing a double burden of malnutrition, in the form of undernutrition and overweight and obesity. In adults (>18 years of age), the main problem between these two malnutrition is overnutrition [1]. Data from the WHO shows that around 49% are overweight or obese, with a higher rate in women (53%) than in men (more than 45%). In Indonesia, the prevalence of malnutrition in the age group of 19-29 years, the frequency of malnutrition is more around 18% [2]. In 2018, the prevalence of obesity for adults was 24.4%, the prevalence of overweight was 14.9% and the prevalence of being thin was 8.3%. In 2013 the prevalence of obesity for adults was 20.1%, the prevalence of overweight was 12.3% and the prevalence of being underweight was 9.2% [3].

Nutritional status, especially Body Mass Index (BMI), is influenced by direct and indirect factors [1]. Factors that directly affect nutritional status include age, nutrient intake, infection and inflammatory conditions, and physical activity. Meanwhile, indirect factors include income, education, and sleep duration [2]. Diet patterns and physical activity are said to be the most influential factors in nutritional status through energy balance [3]. Meanwhile, several studies show that students tend to have unhealthy intake patterns [2]. Research by Delvarianzadeh and his colleagues, (2016), shows that most students have low physical activity, but the level of this activity is still higher compared to the working group [2]. Research by Priyadhisini and his colleagues. (2017). It is mentioned that nutrition has a greater effect on academic performance with academic scores that tend to be lower than normal nutrition [2].This nutritional problem can affect students in pursuing their education, ranging from laziness to study, loss of focus, and stress [1]. Students are inseparable from stress during activities, it is known that 6% of students in Indonesia have experienced stress [2]. Some of the factors that cause stress in students are the tendency to postpone assignments, lack of confidence, difficulty understanding the material, and economic problems [1]. Students use various ways to cope with stress, one of which is by eating [1]. Eating is used to eliminate heavy loads that lead to wrong eating patterns (Emotional Eating) and affect nutritional status [3].The clinical clerkship program is an important part of the Indonesian medical education system [1]. At this stage, students will be faced with real situations that they will face daily as a doctors [2,3]. The period for the implementation of this practice is a minimum of 2 years, in practice, it goes directly to the field to serve patients. Although the clinical learning process provides great benefits and fun for students, this process has many challenges [4]. Clinical student services related to patients are required to always be able to serve well, on target, and on time [5].This study aims to determine the relationship between nutritional intake, physical activity, and stress level with the nutritional status of clinical students of the Faculty of Medicine at the Jayapura Regional General Hospital.

## 2. Research Methods

The research uses a quantitative design with a cross-sectional study design. The population is 164 students of the Faculty of Medicine, Cenderawasih University who are undergoing clinical clerkship. The sample was 80 people who were taken by the Purposive Sampling Technique. Nutrient intake was measured using the Food Frequency Questionnaire (FFQ) Form, [12,3]. Respondents' physical activity was measured using. International Physical Activity Questionnaire (IPAQ) Form [4,5,6]. Stress levels were measured using the Depression Anxiety Stress Scale 42 Form (DASS42)[7] and the nutritional status of students was measured using Scales and Microtoise. The data were analyzed by the Chi-Square Test, and the Prevalence Ratio Test and the Logistic Regression Test.

## 3. Research Results

### *3.1. Analisis Univariate*

**Table 1:** Karaketristik Responden

| No | Variable | Frekuensi (n) | Presentase (%) |
|---|---|---|---|
| 1 | **Age** | | |
| | < 25 Years | 21 | 26,25 |
| | ≥25 Years | 59 | 73,75 |
| | **Gender** | | |
| 2 | Male | 25 | 31,30 |
| | Female | 55 | 68,80 |
| | **Height** | | 51,25 |
| 3 | < 160 cm | 41 | 48,75 |
| | ≥ 160 cm | 39 | |
| | **Weight** | 44 | 55,00 |
| 4 | < 67 kg | 36 | 45,00 |
| | ≥ 67 kg | | |
| | **Rotasi Stase** | 44 | 55,00 |
| 5 | Mayor | 36 | 45,00 |
| | Minor | | |
| | JSum | 80 | 100% |

Source: Primary data, 2024

### *3.2. Analisa Bivariat*

a. The Relationship between Nutritional Intake and Nutritional Status

**Table 2:**The Relationship between Nutritional Intake and Nutritional Status of Clinical Students of the Faculty of Medicine at the Jayapura Regional General Hospital

| Nutritional Intake | Nutritional Status | | | | n | % | *p value* | PR CI95% |
|---|---|---|---|---|---|---|---|---|
| | More | | Normal | | | | | |
| | n | % | n | % | | | | |
| More | 11 | 44,0 | 14 | 56,0 | 25 | 100 | 0,040 | 1,925 (1.122-3.301) |
| Good | 39 | 70,9 | 16 | 29,1 | 55 | 100 | | |
| Total | 50 | 62,5 | 30 | 37,5 | 80 | 100 | | |

*Sumber: Data Primer, 2024*

The research uses a quantitative design with a cross-sectional study design. The population is 164 students of the Faculty of Medicine, Cenderawasih University who are undergoing clinical clerkship. The sample was 80 people who were taken by the Purposive Sampling Technique. Nutrient intake was measured using the Food Frequency Questionnaire (FFQ) Form, [1,2,3]. Respondents' physical activity was measured using. International Physical Activity Questionnaire (IPAQ) Form [4,5,6]. Stress levels were measured using the Depression Anxiety Stress Scale 42 Form (DASS42)[7] and the nutritional status of students was measured using Scales and Microtoise. The data were analyzed by the Chi-Square Test, the Prevalence Ratio Test, and the Logistic Regression Test.

b. The Relationship between Physical Activity and Nutritional Status

**Table 3:** The relationship between physical activity and nutritional status of clinical students of the Faculty of Medicine, Cenderawasih University at Jayapura Regional General Hospital

| Physical Activity | Nutritional Status | | | | n | % | *p value* | PR CI95% |
|---|---|---|---|---|---|---|---|---|
| | More | | Good | | | | | |
| | N | % | n | % | | | | |
| Less | 27 | 56,3 | 21 | 43,8 | 48 | 100 | 0,239 | 1,556 (0,820– 2,950) |
| Heavy | 23 | 71,9 | 9 | 28,1 | 32 | 100 | | |
| Total | 50 | 62,5 | 30 | 37,5 | 80 | 100 | | |

*Source: Primary Data, 2024*

From Table 3, it is known that of the 48 students who have less physical activity, there are 27 people (56.3%) with more nutritional status. Of the 32 students who had heavy physical activity, 23 people (71.9%) were more nutritious. The results of the chi-square statistical test at the meaning value of 95% (( = 0.05) were obtained with a p-value of 0.239 or $p > \alpha$ (0.05), thus the relationship between physical activity was not significant on the nutritional status of clinical students of the Faculty of Medicine, Cenderawasih University. When viewed from

the value of RP = 1.556 CI 95% (0.820 – 2.950), because the lower and upper values include the number 1, so the RP value is not significant.

c. The Relationship between Stress Levels and Nutritional Status

**Table 4:** The Relationship between Stress Level and Nutritional Status of Students of the Faculty of Medicine, Cenderawasih University at Jayapura Regional General Hospital

| Stress Levels | Nutritional Status | | | | n | % | *p value* | PR |
|---|---|---|---|---|---|---|---|---|
| | More | | Good | | | | | |
| | n | % | n | % | | | | CI95% |
| Heavy | 8 | 50 | 8 | 50 | 16 | 100 | 0,386 | 1,445 (0,802-2,639) |
| Normal | 42 | 65,6 | 22 | 34,3 | 64 | 100 | | |
| Total | 50 | 62,5 | 30 | 37,5 | 89 | 100 | | |

*Source: Primary Data, 2024*

Based on table 4, shows that 16 students who have severe stress levels are 8 people (50%) with more nutritional status. Of the 64 students who had normal stress levels, there were 42 people (65.6%) with more nutritional status. The results of the chi-square statistical test at the significance value of 95% (( = 0.05) were obtained with a p-value of 0.386 or p > α (0.05), thus the relationship between stress levels was not significant on the nutritional status of clinical students of the Faculty of Medicine, Cenderawasih University. When viewed from the value of RP = 1.445 CI 95% (0.802 – 2.639) because the lower and upper values include the number 1, so the RP value is not significant.

### *3.3. Multivariate Analysis*

Multivariate analysis is used to obtain answers to which factors affect the nutritional status of students, so it is necessary to conduct a bivariate analysis and continue with the multivariate test. Bivariate modeling using logistic regression tests began with bivariate modeling with a category of p-value < 0.25 using the enter method where each independent variable was tested against the dependent variable. Based on table 9, shows that 16 students who have severe stress levels are 8 people (50%) with more nutritional status. Of the 64 students who had normal stress levels, there were 42 people (65.6%) with more nutritional status. The results of the chi-square statistical test at the significance value of 95% (( = 0.05) were obtained with a p-value of 0.386 or p > α (0.05), thus the relationship between stress levels was not significant on the nutritional status of clinical students of the Faculty of Medicine, Cenderawasih University. When viewed from the value of RP = 1.445 CI 95% (0.802 – 2.639) because the lower and upper values include the number 1, so the RP value is not significant.

**Table 5:** Bivariate Analysis Between Dependent and Independent Variables

| No | Variable | *p value* | OR | 95% CI | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| 1 | Nutritional Intake | 0,040 | 1,925 | 1,122 | 3,301 |
| 2 | Physical Activity | 0,239 | 1,556 | 0,820 | 2,950 |
| 3 | Stress Levels | 0,386 | 1,455 | 0,802 | 2,639 |

*Source: Primary Data, 2024*

Table 5 above the variables of Nutritional Intake and Physical Activity are included in the *p-value* category < 0.25, so they are included in the multivariate model and tested together with the logistics binary test of *the LR forward method* . The results of the mutltivariate analysis were obtained *with a p- value* of < 0.05 as shown in Table 6 below.

**Table 6:** Analysis of Multiple Logistic Regression Variables

| No | Variable | B | *p value* | OR | 95% C. I. for Exp (B) | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| 1 | Nutritional Intake | -1,132 | 0,024 | 0,322 | 0,121 | 0,860 |
| | Constant | 1,373 | 0,110 | 3,948 | | |

*Sumber: Data Primer, 2024*

Table 6 above, obtained a beta correlation coefficient value of -1.132 which states that there is a strong relationship with *a p-value* of 0.024; OR = 0.322; CI95% (0.121 – 0.860) which is interpreted that the dominant factor that affects the nutritional status of students at the Jayapura Regional General Hospital is nutritional intake.

## 4.Discussion

### a. The Relationship of Nutritional Intake to the Nutritional Status of Clinical Students of the Faculty of Medicine, Cenderawasih University at Jayapura Regional General Hospital

The results of the study obtained the relationship between significant nutritional intake and nutritional status of Clinical Students of the Faculty of Medicine, Cenderawasih University. The results of this study are in line with research conducted by Tapera, 2017 that for final year students to experience more nutrition, which is 1.6 times greater than the previous level [32], the same thing was found by Annisa that 29.5% of final semester S1 students at the Faculty of Health, Mh. Thamrin University in 2020. Annisa experienced more nutritional status and revealed that nutrition increased with age and level of study. Finally, students who have a higher proportion of

nutrition are much more than the lower level. The same thing happened in a study in Ghana, where 21.8% of final-year students were overnourished. Compared to other levels, final-year students are considered more at risk of experiencing overnutrition. This is because there are several lifestyle habits such as spending a long time in front of the computer to do tasks, eating more portions when stressed, and eating more snacks between meals. Stress can affect a person's intake and nutritional status. When experiencing stress, a person tends to lose appetite or on the contrary will overeat which has an impact on changes in nutritional status (Nurkhopipah, 2017). Stress is also inseparable from students. The causes of stress for students can come from academic life, such as external demands and self-demands. External demands can be in the form of lesson loads, coursework, parents' demands to succeed in college, and adjustment to the campus environment. The stress experienced by final-year students is related to weight gain and loss.

There are various ways to deal with pressure for final year students, such as worship, listening to music, exercising, doing hobbies, telling stories, and eating. In this case, eating is used to relieve excessive pressure or burden (overeating), resulting in unhealthy eating behaviors that can affect nutritional intake known as emotional eating. However, it is not uncommon for students to choose to eat little or not eat which can reduce their nutritional status (under eating). In the research of final-year students in Semarang, there was a change in overeating behavior in as many as 44% of students [1,2,3].

Intake of foods that come from foods with high calories but low fiber such as snack food per serving with > energy of 250 calories, more than 17 grams of sugar content, > 4 grams of saturated fat content and less than 2 grams of protein in a person will affect a person's nutritional status [33].

**b. The Relationship between Physical Activity Level and Nutritional Status of Clinical Students of the Faculty of Medicine, Cenderawasih University at Jayapura Regional General Hospital**

The results of the study were obtained that the Relationship of Physical Activity Level had no significance to the Nutritional Status of Clinical Students of the Faculty of Medicine, Cenderawasih University at the Jayapura Regional General Hospital. Thing. In line with research conducted by Nawaf (2022) in Bogor that there is no significant relationship between the level of physical activity and nutritional status in students [4].The level of physical activity carried out by medical students has a strong correlation with nutritional status. Recent studies show that students who are physically active tend to have better nutritional status than those who are less active. This can be explained by the fact that physical activity directly affects the body's metabolism including nutrient absorption and energy expenditure. Students who are physically active tend to have a tendency to eat a more balanced diet and obtain enough nutrients to maintain their health and performance [4].The relationship between physical activity levels and nutritional status was not always significant in all cases. There are other factors that also affect nutritional status, such as diet, genetic factors, and social environment. For example, although a student may be physically active, if his diet is unbalanced or if he consumes too much-processed foods that are not nutritious, it can compromise his nutritional status. Therefore, it is important to consider various factors that can affect nutritional status holistically in the context of medical student health [4,5,6].

The Relationship of Stress Levels to the Nutritional Status of Clinical Students of the Faculty of Medicine,

Cenderawasih University at the Jayapura Regional General Hospital

The results of the study showed that the Stress Level Relationship had no significance to the Nutritional Status of Clinical Students of the Faculty of Medicine, Cenderwasih University at the Jayapura Regional General Hospital. These results are in line with research conducted by Laras (2022) in Semarang that there is no significant relationship between stress levels and students' nutritional status [1].

Research on the relationship between stress levels and nutritional status in medical students showed insignificant results. This means that the data collected from various research subjects do not show a strong correlation or great influence between these two variables. One of the main reasons may be the existence of other factors that are more dominant in influencing the stress level of medical students, such as academic load, busy schedules, pressure from the surrounding environment, and social support received. In addition, good or poor nutritional status may indirectly affect stress levels, but play a more role as a supporting factor in general health [1,2].

These insignificant results could be due to large individual variations in how students respond to stress and manage their diets. Some college students may have better coping mechanisms or have stronger sources of support, so the stress they experience does not have a significant impact on their nutritional status. Other factors such as eating habits that have been formed since before entering college and access to healthy food on campus can also contribute. Further research is needed to identify other factors that may play a role in exploring the complex mechanisms of stress and nutritional status [1,2].

Physical activity will affect a person's nutritional status because with this physical activity will produce body

Students on nutritional status at the Jayapura Regional General Hospital. In line with research conducted by Damayanti (2023) in Mesuji Regency, the dominant movements produced by skeletal muscles that require energy expenditure. Good nutritional status is needed to maintain fitness and health, help growth for children and support the development of sportsman's achievements. For students, good nutritional intake accompanied by balanced physical activity can provide good physical growth and proud achievements and avoid being overweight or obese [34].

**c. The Relationship of Stress Levels to the Nutritional Status of Clinical Students of the Faculty of Medicine, Cenderawasih University at the Jayapura Regional General Hospital**

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**d. Dominant Factor of Nutritional Intake in Clinical Students on Nutritional Status at Jayapura Regional General Hospital**

The results of the study were obtained from the most dominant Nutritional Intake in Clinical factor that affects nutritional status is nutritional intake.

Nutrition intake has a big impact on students due to irregular diets, and students often face dense activities that require sufficient energy and nutrition, but sometimes choose unhealthy foods due to time and budget constraints. This condition can disrupt their daily nutritional balance, which in turn affects cognitive performance and concentration. Understanding the importance of a balanced nutritional intake is very important for students to maintain their overall health. Food in the body has three main functions, namely as a building substance, a source of energy, and a regulatory substance. By utilizing nutritional intake, our life needs for food substances and good nutritional status can be met so that the body can carry out life activities well [32],

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