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The Correlation Between Dietary Patterns and Physical Activity with Body Mass Index Among Faculty of Medicine UKI Students Class of 2022 in 2024

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Abstract
Introduction: *Dietary patterns and physical activity levels are critical determinants of health. UNICEF reports show a significant increase in processed food and fat consumption among Indonesian adolescents. Additionally, physical activity levels remain low, often falling below 90 minutes per week. These factors directly influence body composition as measured by Body Mass Index (BMI).* ***Objective****: This study aims to analyze the relationship between dietary patterns, physical activity, and BMI among medical students at Universitas Kristen Indonesia, batch of 2022.* ***Method:*** *This research used an analytical observational design with a cross-sectional approach. The study involved a sample of 112 participants. Data were collected using dietary pattern questionnaires and the Global Physical Activity Questionnaire.* ***Result and Discussion:*** *The bivariate analysis using the chi-square test yielded a p-value of 0.697 for the relationship between dietary patterns and BMI, indicating no significant correlation. However, the analysis of physical activity showed a significant relationship with BMI, with a p-value of 0.000. These results suggest that physical movement has a more immediate impact on BMI than dietary habits in this specific population.* ***Conclusions:*** *Physical activity significantly correlates with BMI among the studied students, while dietary patterns do not show a statistically significant association.*

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Introduction

The rapid advancement of technology significantly alters human lifestyles, particularly through the convenience of online food delivery and digital transportation services. This digital dependency encourages a sedentary lifestyle and a preference for instant, processed foods to save time. Consequently, many individuals prioritize convenience over nutritional value, leading to poor dietary habits and physical inactivity (Savage et al., 2024); (Ibraimi et al., 2025).

Current trends indicate a worrying shift in adolescent health metrics. Reported a twofold increase in the consumption of fatty and fast foods among Indonesian adolescents. Furthermore, physical activity levels remain critically low, with many adolescents engaging in less than 90 minutes of exercise per week, far below the recommended 150 minutes of moderate-intensity activity for adults. National data from 2018 showed that 33.5% of Indonesians fall into the sedentary category, highlighting a significant public health challenge (Fauziyyah et al., 2021); (Nadeak et al., 2025); (Rismawati, 2021); (Rivaldi et al., 2023); (Nabawiyah et al., 2023).

Dietary patterns defined by the quantity and quality of daily food intakeplay a vital role in determining nutritional status. The high content of carbohydrates, fats, sugar, and salt in processed foods, combined with irregular eating schedules, contributes heavily to nutritional imbalances. Simultaneously, physical activity is essential for metabolic health. Lack of movement results in energy storage as body fat, which directly increases Body Mass Index (BMI). While several studies have explored general obesity, there is a research gap regarding how these specific behavioral factors interact within the high-stress environment of medical students, who often face unique time constraints (Tebar et al., 2020); (AlKilani et al., 2025); (Nadira et al., 2022).

This study aims to analyze the relationship between dietary patterns, physical activity, and BMI among medical students at Universitas Kristen Indonesia, batch of 2022. Specifically, the research identifies the characteristics of these students, measures their current BMI, evaluates their specific dietary and activity habits, and determines the statistical significance of these factors in influencing body composition (Batubara et al., 2024); (Priantoro, 2017); (Amin et al., 2023); (Maulana, 2022)

Method

This study employed an analytical observational design using a cross-sectional approach to investigate the relationship between behavioral factors and body composition. The research was conducted at the Faculty of Medicine, Universitas Kristen Indonesia, between February and April 2024.

Population and Sampling

The study population consisted of 156 medical students from the batch of 2022. Using the Slovin formula with a 5% margin of error, a minimum sample size was determined:

$$n = \frac{N}{1 + N\,(e)^2}$$

$$n = \frac{156}{1 + 156\,(0{,}05)^2} = 112$$

A simple random sampling technique was applied to select the 112 participants who met the inclusion criteria (active students aged 17–22 years).

Data Collection and Instruments

Primary data were collected via digital questionnaires encompassing three primary metrics: dietary patterns evaluated through a 10-item Guttman Scale and categorized as "Good" (>50%) or "Poor" (≤50%); physical activity measured using the WHO-developed Global Physical Activity Questionnaire (GPAQ) and quantified via Metabolic Equivalent Task (MET) minutes to determine low, moderate, or high activity levels; and Body Mass Index (BMI), which was calculated by dividing body weight by the square of height (m^2) according to Asia-Pacific WHO standards.

Data Analysis

Statistical analysis was performed using SPSS, beginning with a reliability test that confirmed an instrument Cronbach's Alpha of 0.728, followed by univariate analysis to describe the frequency distribution of participant characteristics and bivariate analysis utilizing the Chi-Square test to determine the correlation between independent variables dietary patterns and physical activity and the dependent variable of BMI, with a significance threshold established at $p < 0.05$.

Result and Discussion

1. Result

Univariate Analysis

Univariate analysis was conducted to determine the frequency distribution of each variable, including respondent characteristics, dietary patterns, physical activity, and body mass index (BMI).

Respondent Characteristics

The table below presents the demographic data obtained from the questionnaires, including gender, age, and place of residence.

Table 1
Frequency Distribution Based on Gender

Gender	Frequency (n)	Percentage (%)
Male	30	26.8
Female	82	73.2
Total	**112**	**100**

Based on the table above, female respondents were more predominant than males. The data shows that females accounted for 73.2% (82 individuals), while males accounted for 26.8% (30 individuals)

Table 2
Frequency Distribution Based on Age

Age	Frequency (n)	Percentage (%)
18	2	1.8
19	48	42.9
20	45	40.2
21	16	14.3
22	1	0.9
Total	**112**	**100**

According to the age distribution table above, the majority of respondents are 19 years old, accounting for 42.9% (48 out of 112 respondents).

Table 3
Frequency Distribution Based on Place of Residence

Place of Residence	Frequency (n)	Percentage (%)
Boarding House (Kos)	51	45.5
Private Residence	61	54.5
Total	**112**	**100**

Based on the place of residence, more respondents live in a private residence compared to a boarding house. The data shows that 54.5% (61 individuals) live in their own homes, while 45.5% (51 individuals) reside in boarding houses.

Dietary Patterns

Table 4
Frequency Distribution of Dietary Patterns

Dietary Pattern	Frequency (n)	Percentage (%)
Good dietary pattern	70	62.5
Poor dietary pattern	42	37.5
Total	**112**	**100**

Based on the table above, 62.5% (70 out of 112 respondents) possess a good dietary pattern, while 37.5% (42 individuals) are categorized as having a poor dietary pattern.

Physical Activity

Table 5
Frequency Distribution of Physical Activity

Physical Activity	Frequency (n)	Percentage (%)
Low	64	57
Moderate	28	25
High	20	18
Total	112	100

As illustrated in the table above, respondents with low physical activity represent the largest group at 57% (64 individuals), followed by moderate activity at 25% (28 individuals), and high activity at 18% (20 individuals).

Body Mass Index (BMI)

Table 6
Frequency Distribution of Body Mass Index

Body Mass Index (BMI)	Frequency (n)	Percentage (%)
< 18.5 (Underweight)	6	5.4
18.5 – 22.9 (Normal Weight)	54	48.2
23 – 24.9 (Overweight with Risk)	22	19.6
25 – 29.9 (Obesity I)	20	17.9
≥ 30 (Obesity II)	10	8.9
Total	**112**	**100**

Based on the table above, the distribution of respondents' Body Mass Index (BMI) is as follows: 5.4% (6 individuals) are underweight (< 18.5), 48.2% (54 individuals) have a normal weight (18.5 – 22.9), 19.6% (22 individuals) are overweight with risk (23 – 24.9), 17.9% (20 individuals) fall into the Obesity I category (25 – 29.9), and 8.9% (10 individuals) are categorized as Obesity II (≥ 30).

Bivariate Analysis

Bivariate analysis was conducted to determine the relationship between variables. This study employed the Chi-Square method for bivariate analysis. The hypothesis is accepted if the p-value is < 0.05, indicating a statistically significant correlation between variables. Conversely, if the p-value is > 0.05, no significant correlation exists.

Analysis of the Relationship between Dietary Patterns and Body Mass Index (BMI) among Medical Students of FK UKI, Batch of 2022

Table 7
Bivariate Results of Dietary Patterns toward BMI

	BMI						
	< 18.5 (Underweight)	18.5 – 22.9 (Normal)	23 – 24.9 (Overweight w/ Risk)	25 – 29.9 (Obesity I)	>30 (Obesity II)	**Total**	**P value**
Dietary Pattern	**Frequency (n)**						
Good	3	32	14	15	7	71	
Poor	3	22	8	5	3	41	0.697
Total	6	54	22	20	10	112	

The statistical test results using the Chi-Square method yielded a p-value of 0.697. Since the p-value (0.697) is > 0.05, it can be concluded that there is no significant relationship between dietary patterns and Body Mass Index (BMI) among medical students at the Faculty of Medicine, Universitas Kristen Indonesia, batch of 2022.

2. Discussion

Dietary Patterns of 2022 Cohort Medical Students at UKI

This study shows that 62.5% (70 students) of the 2022 cohort at the UKI Faculty of Medicine maintain good dietary patterns, while 37.5% (42 students) exhibit poor patterns. Managing dietary habits is crucial for students to align their nutritional intake with daily energy requirements. Proper dietary management prevents overweight by prioritizing nutrient-dense foods, limiting energy-dense portions, and reducing overall energy density. Optimal health requires a balance of essential nutrients. However, the average

student tends to overlook nutritional needs and pays little attention to the ingredients or types of food they consume.

Questionnaire results indicate that 97.4% (109 students) consume carbohydrates daily and 99.1% (111 students) consume protein daily. Meanwhile, only 50.9% (58 students) consume vegetables with every meal. Data also shows frequent consumption of fast food (46.5%), instant food (51.8%), and sugary foods or drinks (57%). These results suggest that while students fulfill basic needs for carbohydrates, protein, and fiber, their intake of instant, fast, and sugary products remains high. Limited food options at the UKI Faculty of Medicine canteen may drive this trend, leaving students with few menu choices and a preference for processed foods due to time efficiency and flavor.

Physical Activity of 2022 Cohort Medical Students at UKI

This study reveals that the majority of 2022 cohort medical students at UKI engage in low physical activity, accounting for 57% (64 students). This is followed by moderate activity at 25% (28 students) and high activity at 18% (20 students). These findings are based on the Global Physical Activity Questionnaire (GPAQ) and Metabolic Equivalent Task (MET) calculations, where the average student scored <600 METs, indicating low physical activity. Insufficient physical activity prevents efficient fat burning, leading to fat accumulation; consequently, individuals with low activity levels are more prone to weight gain.

Data from the 2022 cohort shows that 27 students with elevated Body Mass Index comprising overweight (14), obese (8), and class II obesity (5) report low physical activity. A demanding academic schedule often leaves students with little time for exercise. Additionally, the availability of private vehicles (motorcycles or cars) and online transportation services encourages students to use these modes of transport even for short distances.

Socioeconomic status also influences physical activity. Individuals from lower socioeconomic backgrounds may lack the funds for sports equipment or gym memberships and often face limited access to physical environments such as stadiums or parks. Conversely, those with higher socioeconomic status typically have more financial resources to support participation in these fitness activities.

Body Mass Index (BMI) of 2022 Cohort Medical Students at UKI

Body Mass Index (BMI) is a simple measurement method used to determine an individual's nutritional status. Various factors influence BMI, including gender, age, dietary patterns, physical activity, and genetics. This study shows that 48.2% (54 students) have a normal BMI, while 5.4% (6 students) are underweight. However, 19.6% (22 students) are overweight, 17.9% (20 students) are obese, and 8.9% (10 students) have class II obesity. These data indicate that a significant number of 2022 cohort medical students at UKI fall within the overweight to obese categories. This trend stems from several factors, primarily low to moderate physical activity levels that create an imbalance between energy intake and expenditure, alongside poor nutritional habits and unbalanced dietary patterns.

Correlation Between Dietary Patterns and Body Mass Index (BMI) Among 2022 Cohort Medical Students at UKI

Analysis of the correlation between dietary patterns and Body Mass Index (BMI) among 2022 cohort medical students at UKI yielded a p-value of 0.697 ($p > 0.05$). These results indicate no significant correlation between dietary patterns and BMI in this group.This finding aligns with a 2016 study by Koko, which reported a p-value of 0.106 ($p > 0.05$), showing no significant relationship. Similarly, Novi (2022) found no significant correlation between BMI and dietary patterns ($p = 0.702 > 0.05$). However, this study diverges from Mindo's 2022 research at Advent Junior High School Bandar Lampung, which reported a significant relationship ($p = 0.049 < 0.05$).The data shows that both good and poor dietary patterns are distributed across various BMI categories. For instance, 40 students with good dietary patterns fall into the overweight and obese categories, while 22 students with normal BMI exhibit poor dietary patterns. This discrepancy likely stems from incomplete questionnaire data, such as the absence of meal frequency, portion sizes, and specific food types consumed daily. Consequently, the lack of accurate calorie estimation prevents the author from determining whether respondents met their daily Recommended Dietary Allowance (RDA).Other factors also influence BMI, including genetics. According to the Indonesian Ministry of Health, if one parent is obese, the child has a 40% to 50% chance of becoming obese; if both parents are obese, the probability rises to 70% or 80%. While BMI is a common, cost-effective method for assessing nutritional status, it cannot directly analyze body fat. BMI fails to distinguish between fat mass and lean mass, which may lead to inaccuracies in measurement and contribute to the statistically non-significant correlation observed between dietary patterns and BMI.

Correlation Between Physical Activity and Body Mass Index (BMI) Among 2022 Cohort Medical Students at UKI

Analysis of the correlation between physical activity and Body Mass Index (BMI) among 2022 cohort medical students at UKI yielded a p-value of 0.000 ($p < 0.05$). This indicates a significant correlation between physical activity and BMI. This finding aligns with a 2022 study by Mifthahul, which reported a p-value of 0.048 ($p < 0.05$), showing a relationship between physical activity and BMI among public health students in Samarinda. Similarly, found a significant correlation ($p = 0.001 < 0.05$) among nursing students at Muhammadiyah University. The data reveals that 64 respondents engage in low physical activity. Low daily physical exercise reduces energy expenditure; without balanced nutritional intake, this leads to physiological imbalance. This study observes that medical students living in boarding houses exhibit lower physical activity levels compared to those living with family. The author assumes that demanding academic schedules leave students especially those living independently with little time for exercise, as they must manage their daily needs alone. Furthermore, individual motivation significantly influences physical activity levels. According to Yoli (2019), motivation to exercise arises from several factors, including the availability of sports facilities and support from family, peers, or university staff, such as lecturers.

Conclusion

The majority of the 2022 cohort of UKI medical students are female (82 students), aged 19–20 years, and reside in their own homes. While most students maintain a normal Body Mass Index (54 out of 112) and follow good dietary patterns (74 students), a significant portion exhibits low physical activity with MET values below 600 (64 students). Statistical analysis reveals no correlation between dietary patterns and BMI; however, a significant correlation exists between physical activity and BMI among these students.

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