Dietary Intake and Physical Activity of Medical School Students at Universitas Pelita Harapan, Indonesia

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Abstract

Background: Medical students face high academic demands, which often lead to irregular eating patterns and a lack of physical activity, which can have a negative influence on their nutritional status and overall well-being. This study aimed to evaluate the dietary intake and physical activity levels among medical students at Universitas Pelita Harapan, Indonesia.

Methods: A cross-sectional study was conducted on 70 undergraduate medical students. Demographic data and physical activity levels (assessed using the International Physical Activity Questionnaire, IPAQ) were collected. Dietary intake was evaluated using a semi-quantitative food frequency questionnaire (SQ-FFQ), and nutrient intakes were analyzed and compared with the Indonesian Recommended Dietary Allowances (RDA) for women aged 19–29 years. Data analysis included descriptive statistics for continuous and categorical variables.

Results: There were 70 participants, with a mean age was 20.73 ± 0.81 years; the majority were female (n = 62). Physical activity levels were distributed as 35.7% low, 38.6% moderate, and 25.7% high. Mean daily energy intake (1677.58 kcal) was below the RDA, as were intakes of fat, carbohydrates, fiber, calcium, sodium, potassium, and vitamin A. Intakes of protein, phosphorus, iron, vitamin C, riboflavin, and niacin were above RDA recommendations.

Conclusions: Medical students at Universitas Pelita Harapan were found to have suboptimal dietary intake, particularly with regard to energy, fiber, and several micronutrients, as well as varying levels of physical activity. These findings emphasize the need for targeted interventions to promote balanced nutrition and regular physical activity in this population.

Introduction

It has become a concern that there is a high prevalence of unhealthy eating patterns and sedentary lifestyles among students worldwide, particularly among medical students who are expected to demonstrate health-promoting behaviors.[1,2] High academic pressure and irregular daily schedules are common in medical education. This can negatively impact eating habits and reduce time for physical activity, contributing to poor nutritional status and an increased risk of chronic disease later in life.[1,2]

Previous research has found that medical students often have inadequate consumption of fruits, vegetables, and dietary fiber, as well as excessive intake of processed foods, sodium, and saturated fat.[3–6] This condition is often accompanied by irregular meal times, skipping meals, and a reliance on convenient instant foods, while academic stress will make it worse.[2,7] In the Indonesian setting, similar challenges were also found, reflecting global and local trends in students' dietary behavior.[8]

Medical students also face challenges when it comes to physical activity, a key determinant of health. Previous research has found that most medical students are physically inactive and have a sedentary lifestyle, despite recognizing the benefits of regular exercise.[9–11] Unhealthy diet and lack of physical activity can have a negative impact on current health status as well as on academic performance and professional competence, especially as future healthcare providers who are expected to educate the public about healthy lifestyles.[12-14]

Currently, data on the dietary patterns and physical activity of Indonesian medical students is still scarce, particularly when compared with the Indonesian Recommended Dietary Allowance (RDA). Several previous studies have examined dietary intake or physical activity, but studies that address both in the context of medical education in Indonesia are still limited.[8,15]

Therefore, this study aims to fill this gap by assessing the dietary intake and physical activity levels of medical students at Universitas Pelita Harapan. Students from the School of Medicine, Universitas Pelita Harapan, were chosen because they represent the population of a private university in a large city in Indonesia who are prone to having an unhealthy diet and a sedentary lifestyle. The objectives of this research are: (1) to describe the sociodemographic of the samples; (2) to quantify dietary intake and compare it against the Indonesian RDA; (3) to evaluate physical activity levels using a validated instrument; and (4) to discuss the implications of these findings in the context of existing literature and medical education.

Material And Methods

This study used a quantitative, observational research design with a cross-sectional approach. The population included bachelor's degree students at the School of Medicine, Universitas Pelita Harapan, Tangerang, Indonesia, who fulfilled the study criteria. A purposive sampling method was used to select 70 respondents. The study was conducted from January to April 2025. Ethical approval was obtained from the Ethics Committee of the School of Medicine, Universitas Pelita Harapan, and all

respondents were required to read and complete an informed consent form at the beginning of the questionnaire.

Inclusion criteria included active medical bachelor program students who were willing to participate in this study. Exclusion criteria included those who were unable to complete the questionnaire. Data collection was carried out through an online survey using "KoboToolbox". Respondents completed a Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) to assess their daily dietary intake. The SQ-FFQ was adapted from the version developed by the Indonesian Ministry of Health for the 2010 Non-Communicable Disease Survey.[16] Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ) short form, which has been validated for use in young adult populations.[17] The IPAQ categorizes activity levels as low, moderate, or high based on total weekly metabolic equivalent (MET)-minutes. Respondents were classified into one of these categories according to established scoring protocols.

Nutrient intakes were calculated using a standardized Indonesian food composition database. Daily intakes of energy, macronutrients (protein, fat, carbohydrates, fiber), selected minerals (calcium, phosphorus, iron, sodium, potassium, zinc), and vitamins (A, C, thiamin, riboflavin, niacin) were computed.

The calculated mean nutrient intakes were compared to the Indonesian RDA for females aged 19–29 years, as the majority of the sample were female. Intake adequacy was categorized as: below, adequate, or above the RDA for each nutrient.

Data were analysed using SPSS version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize continuous variables (mean, standard deviation, range) and categorical variables (frequency, percentage). Results are presented in tabular form. Nutrient intake status relative to RDA was interpreted descriptively.

Result

Sample Characteristics

The sociodemographic and physical activity characteristics of the study participants are summarized in Table 1.

Table 1. Sociodemographic and Physical Activity Characteristics of Participants (N = 70)

Variable	n	%	Mean ± SD / Range
Age (years)	-	-	20.73 ± 0.81 (19–22)
Sex			
- Female	62	88.6	
- Male	8	11.4	
Physical Activity (IPAQ)			
- Low	25	35.7	
- Moderate	27	38.6	
- High	18	25.7	

The mean age of participants was 20.73 years (SD ± 0.81; range 19–22). The majority of participants were female (88.6%). Physical activity classification indicated that 35.7% of students had low activity levels, 38.6% moderate, and 25.7% high.

Dietary Intake Patterns

The mean daily nutrient intakes, RDA values, and adequacy status are presented in Table 2.

Table 2. Mean Daily Nutrient Intakes of Medical Students Compared to Indonesian RDA (Female, 19–29 years, N = 70)

Nutrient	Mean Intake	RDA	Status vs RDA
Energy (kcal)	1677.58	2250	Below RDA
Protein (g)	65.49	59	Above RDA
Fat (g)	61.83	72	Below RDA
Carbohydrate (g)	214.07	309	Below RDA
Fiber (g)	12.11	30	Below RDA
Calcium (mg)	698.53	1100	Below RDA
Phosphorus (mg)	990.30	700	Above RDA
Iron (mg)	20.27	18	Above RDA
Sodium (mg)	738.96	1500	Below RDA
Potassium (mg)	1933.09	4700	Below RDA
Zinc (mg)	7.95	8	Adequate
Vitamin A (µg RE)	188.76	600	Below RDA
Vitamin C (mg)	113.25	75	Above RDA
Thiamin (mg)	0.84	1.1	Below RDA
Riboflavin (mg)	1.52	1.1	Above RDA
Niacin (mg)	18.21	14	Above RDA

*RDA = Recommended Dietary Allowance, Indonesia

Discussion

This study examines dietary intake and physical activity patterns among medical students at Pelita Harapan University in Indonesia. The results showed significant deficiencies in energy, fiber, and several micronutrients, with most students having low to moderate levels of physical activity. These findings are consistent with those reported in similar populations worldwide. [1,3,6]

Dietary Intake Patterns

Energy and Macronutrients

This study found that participants had a daily energy intake (1677.58 kcal) that was significantly lower than the RDA (2250 kcal). This is consistent with findings from studies in Pakistan, Saudi Arabia, and the United States, which also reported suboptimal energy intake among medical students, often associated with skipping meals and irregular eating habits.[1,2,6] Low energy intake can impair cognitive and physical performance, which is crucial for medical students facing busy academic schedules.

In contrast, protein intake exceeded the RDA (65.49 g vs. 59 g). Similar patterns have been found elsewhere, where protein-rich foods are often preferred for their satiety, but may not compensate for overall energy or micronutrient deficits.[3,5] Fat and carbohydrate intakes were both below recommended values, with carbohydrate

intake being particularly low (214.07 g vs. 309 g). This imbalance may reflect preferences or dietary constraints related to convenience and cost, as well as limited dietary variety.[4,18]

Fiber intake was very low compared to the RDA (12.11 g vs. 30 g), consistent with findings in medical students in the United States and Latin America.[3,9] Insufficient fiber intake has been associated with an increased risk of metabolic and gastrointestinal disorders, and may reflect low consumption of fruits, vegetables, and whole grains, as found in previous studies.[9]

Micronutrients

Calcium, sodium, potassium, and vitamin A intakes were all below RDA recommendations, echoing previous reports of micronutrient inadequacies among medical students.[3,6,10] Calcium deficiency is particularly concerning for young adults, given its importance for bone health and long-term prevention of osteoporosis. Low sodium and potassium intakes may indicate low consumption of mineral-rich foods and/or underreporting of processed food intake.[9] Vitamin A insufficiency, combined with low intake of fruits and vegetables, can have implications for immune and visual health.[10]

Phosphorus, iron, vitamin C, riboflavin, and niacin intakes exceeded recommendations. Elevated iron intake may be attributable to increased consumption of animal-sourced foods or iron-fortified products, which is beneficial for premenopausal women but may not fully mitigate other dietary insufficiencies.[8] High vitamin C intake may reflect consumption of specific fruits or beverages, though this does not appear to translate into adequate fiber or vitamin A intake, highlighting the complexity of dietary behaviors.[3]

Zinc intake was marginally adequate, consistent with findings from other student populations.[3,6] However, marginal deficiencies may still pose risks, particularly in the context of other micronutrient deficits.

Comparison with International Data

The present findings are consistent with studies from diverse settings, which report similar dietary inadequacies among medical students.[1-4,6,10] For example, González-Sosa et al. and Malinowska et al. documented inadequate adherence to healthy dietary patterns, including the Mediterranean diet, among medical students.[4,18] Carcoana et al. and Kesapragada et al. highlighted the gap between nutritional knowledge and practical dietary choices, suggesting that knowledge alone does not guarantee optimal intake.[3,5]

The prevalence of meal skipping, especially breakfast, was observed as a significant factor contributing to

inadequate energy and nutrient intake in several studies.[7,10] Saintila et al. reported that irregular breakfast consumption was associated with higher BMI and poorer dietary quality among medical students in Peru, paralleling trends in Indonesia.[10]

Physical Activity Patterns

The distribution of low (35.7%), moderate (38.6%), and high (25.7%) physical activity levels among participants is comparable to findings from other studies of medical students worldwide.[8,11,12] Kosendiak et al. reported that, during the COVID-19 pandemic, most medical students reduced their physical activity. This may be due to academic pressure, time constraints, and a lack of motivation to be active.[12]

The finding that over one-third of students had low physical activity is concerning, given the well-established benefits of regular exercise for physical, mental, and cognitive health. Szemik et al. and Yadav have emphasized the importance of integrating exercise into the daily routine of medical students to counteract stress and promote overall well-being.[13,14]

The International Physical Activity Questionnaire (IPAQ) provides a useful framework for interpreting activity levels across populations.[17]

Pengpid and Peltzer found that adherence to 24-hour movement guidelines varied widely among ASEAN university students and was closely associated with mental health and diet quality, supporting the regional relevance of our findings.[15]

Implications for Medical Education

The coexistence of suboptimal dietary intake and insufficient physical activity among medical students is particularly problematic, as these individuals are future healthcare providers and role models for healthy behavior. The discrepancy between nutrition knowledge and practice, as highlighted in several studies, suggests that interventions should go beyond didactic teaching to include experiential learning, behavior change strategies, and supportive environments.[3,5]

Medical schools should consider implementing targeted nutrition and lifestyle counseling services, peer support groups, and curricular integration of health promotion activities.[5,13] The use of digital tools and mobile applications, as explored by Marin, may facilitate self-monitoring and promote sustained behavior change.[19]

Limitations

This study has several limitations. The cross-sectional design precludes causal inference. The use of self-reported data for physical activity and dietary intake introduces potential for recall and social desirability bias. The sample was predominantly female, which may limit

generalizability to the broader student population. Future studies should consider larger, more diverse samples and longitudinal designs.

Conclusion

This study demonstrates that medical students at Universitas Pelita Harapan, Indonesia, exhibit suboptimal dietary intake, particularly with respect to energy, fiber, calcium, potassium, sodium, and vitamin A, alongside varied but frequently insufficient levels of physical activity. While protein, iron, phosphorus, vitamin C, riboflavin, and niacin intakes were above recommendations, these do not compensate for broader dietary inadequacies. The findings are consistent with international evidence documenting the vulnerability of medical students to poor nutritional behaviors, despite their health-related training.

Given the critical role of medical students as future healthcare providers, there is an urgent need for integrated interventions targeting both dietary and physical activity behaviors within medical curricula and campus environments. Such efforts are essential not only for the well-being of students themselves but also for their capacity to serve as effective advocates for health promotion in society.

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