Knowledge And Perceptions of Nutrition and Weight Among First-Year Medical Students at Sriwijaya University

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A B S T R A C T

Introduction. Medical students of Sriwijaya University batch 2019 are new students who don't have much knowledge about nutrition. In addition, new students also don't know how to calculate Body Mass Index (BMI) through body height and weight. This study aimed to know the level of nutritional knowledge and the suitability of weight perception among the medical students of Sriwijaya University batch 2019. **Methods.** Descriptive research with a cross-sectional research design was conducted in Health Clinic UPT of Sriwijaya University and the Faculty of Medicine of Sriwijaya University in September 2019. The sample of this study was all medical students from Sriwijaya University batch 2019 who met the inclusion and exclusion criteria. The data was obtained through direct measurement and filling M-GNKQ questionnaire and weight perception questionnaire online. **Results.** In this study, 222 students met the inclusion and exclusion criteria, with 74 male students and 148 female students. As many as 70.7% of students have normal nutritional status. The average value of nutrition knowledge is 18.21 (45.5%) with the lowest value 0 and the highest value 32. Of all of the students, only 52.3% can perceive body weight correctly. The rest, as much as 33.3% is exaggerating perception and 14.4% is reducing perception. **Conclusion.** The knowledge of nutrition among the medical students of Sriwijaya University batch 2019 is still quite low and there are still many students who mistakenly perceive their weight.

1. Introduction

Nutrition is an essential substance needed for growth and body health. Nutrition contains chemical substances that are beneficial for the body's metabolic defense. Carbohydrates, proteins, fatty acids, vitamins, and other elements are some of the chemicals that act as nutrients.[1] Body weight perception is an individual's representation of their body weight. Typically, this representation is expressed in terms of underweight, normal, overweight, or obesity.[2] Several factors such as socio-demographic and environmental factors including gender, Body Mass Index (BMI), ethnicity, socioeconomic status, and media exposure influence an individual's perception of body weight.[3] Currently, people still often have misperceptions about weight. Scalvedi et al. reported that only 46% of Italian adults could answer correctly about nutrition knowledge.[4] Research results from the Department of Community

Medicine, UKM Medical Center Malaysia showed that the level of misperception of young adults was higher than adults.[5] Other studies have shown that women tend to overestimate their weight perception, while men tend to underestimate their weight perception. In addition, socioeconomics and environment also play an important role in setting weight standards for a person.[3]

Naeeni et al. stated that public knowledge regarding nutrition is relatively adequate, although they may not yet apply this knowledge in their daily lives.[6] Additionally, there is a gap in knowledge concerning the content of salt, fat, sugar, and dietary fiber in food within the community.[7] Students of the Faculty of Medicine, Sriwijaya University, class of 2019 are new students who have not received nutrition course material, so their nutrition knowledge is still limited. Therefore, this research needs to be done to assess the level of knowledge of

new students regarding nutrition. In addition, these students are not accustomed to calculating BMI and classifying nutritional status correctly. Therefore, this study aims to investigate their perception of weight and to determine the correspondence between their perceived weight and their actual nutritional status. This study has never been conducted within the Faculty of Medicine of Sriwijaya University, so this study will contribute new insights regarding nutritional knowledge and weight perception among new students of the Faculty of Medicine of Sriwijaya University.

2. Methods

This research is a descriptive study with a cross-sectional design. The sample of this study consists of first-year students from the Faculty of Medicine, Sriwijaya University who meet the research criteria. The inclusion criteria for this study are willingness to participate in the entire research process and signing informed consent. Meanwhile, the exclusion criteria used are students who do not complete the questionnaire in full, and pregnancy or less than six months postpartum. The sampling technique used to take is purposive sampling.

The data collected in this study are primary data, including age, sex, Body Mass Index (BMI), nutrition knowledge, and perception of body weight. Data collection of age and sex is carried out using consent forms and asking subjects to fill out online questionnaires. Data collection of nutrition knowledge is conducted using the Modified-General Nutrition Knowledge Questionnaire (M-GNKQ), which is divided into eleven sections, each assessing different aspects of nutrition knowledge. Kliemann et all have assessed that M-GNKQ as a valid measure of nutrition knowledge.[8]

.After subjects complete the questionnaire, the researcher calculates the score for each subject. Nutritional status is calculated by measuring height and weight which is then converted into BMI (Body Mass Index). All data is then analyzed using a univariate test by using SPSS version 23. Ethical approval is obtained from Mohammad Hoesin Central General Hospital and Faculty of Medicine Sriwiaya University (No. 277/kepkrsmhfkunsri/2019)

3. Results

The total sample consisted of 222 first-year students from the Faculty of Medicine, Sriwijaya University. Nearly twice the number of female students participated, totaling 148 individuals. The majority of students in this study were 18 years old, with the youngest being 16 years old and the oldest being 20 years old.

Based on the distribution data, it is found that there are 17 students classified as severely underweight, 17 students classified as underweight, 157 students classified as normal, 14 students classified as overweight, and 17 students classified as obese. The majority of students have a normal nutritional status.

The average nutrition knowledge score is 18.21, with a minimum score of 0 and a maximum score of 32 out of a total of 40 questions. Among the eleven sections of the questionnaire, most students answered accurately in the section regarding water consumption, with a percentage of 65.54%. Meanwhile, the section regarding protein consumption is the least accurately answered, with only 17.87% correct responses.

Table 1. Characteristics of first-year students at the Faculty of Medicine, Sriwijaya University

Characteristics	Total	Percentage (%)
Sex		
Female	148	66.7
Male	74	33.3
Age		
16 y.o	3	1.4
17 y.o	80	36.0
18 y.o	107	48.2
19 y.o	28	12.6
20 y.o	4	1.8

Nutritional Status of First-Year Students

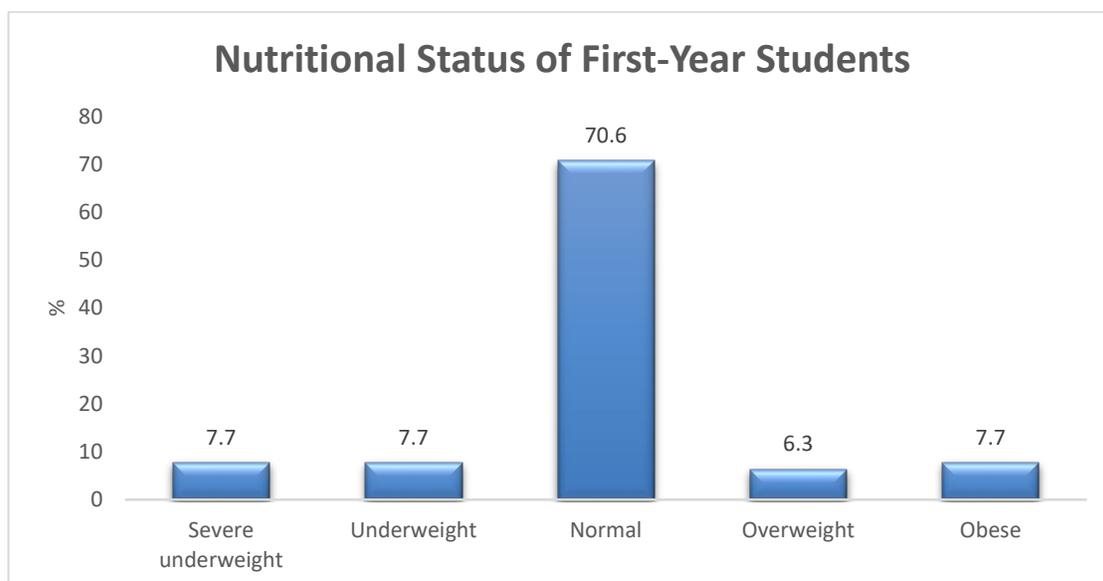| Category	%
Severe underweight	7.7
Underweight	7.7
Normal	70.6
Overweight	6.3
Obese	7.7

Figure 1. Nutritional status of first-year students at the Faculty of Medicine, Sriwijaya University

Table 2. Distribution of first-year students at the Faculty of Medicine, Sriwijaya University answering correctly each question of the nutrition knowledge questionnaire

Section	Total	Percentage	Section	Total	Percentage	Section	Total	Percentage
Diversity and caloric content of food	262	59.01	Question 5	61	27.48	Question 2	102	45.95
			Salt consumption	374	56.16	Question 3	13	5.86
			Question 1	174	78.38	Physical activity and maintaining a normal body weight	385	43.36
Question 1	100	45.05	Question 2	125	56.31			
Question 2	162	72.97	Question 3	75	33.78			
Fiber intake	517	46.58	Fat consumption	778	43.81	Question 1	24	10.81
Question 1	5	2.25	Question 1	187	84.23	Question 2	118	53.15
Question 2	57	25.68	Question 2	18	8.11	Question 3	85	38.29
Question 3	197	88.74	Question 2	52	23.42	Question 4	158	71.17
Question 4	157	70.72	Question 4	96	43.24			
Question 5	101	45.50	Question 5	152	68.47			
Protein consumption	119	17.87	Question 6	152	68.47			
Question 1	69	31.08	Question 7	108	48.65			
Question 2	23	10.36	Question 8	13	5.86			
Question 3	27	12.16	Breakfast consumption	271	40.69			
Carbohydrate intake	289	65.09	Question 1	190	85.59			
Question 1	140	63.06	Question 2	30	13.51			
Question 2	149	67.12	Question 3	51	22.97			
Sugar consumption	591	53.24	Water consumption	291	65.54			
Question 1	167	75.23	Question 1	163	73.42			
Question 2	132	59.46	Question 2	128	57.66			
Question 3	126	56.76	Reading food labels	166	24.92			
Question 4	105	46.30	Question 1	51	22.97			

Table 3. Distribution of body weight perception among first-year students at the Faculty of Medicine, Sriwijaya University

Validation	Total	Percentage
Severely underweight	11	5.0
Underweight	32	14.4
Normal	90	40.5
Overweight	82	36.9
Obese	7	3.2
Total	222	100

Table 4. Distribution of body weight perception congruency among first-year students at the Faculty of Medicine, Sriwijaya University

Perception congruency	Total	Percentage
Accurate perception	116	52.3
Overestimation perception	74	33.3
Underestimation perception	32	14.4
Total	222	100

Among first-year students, it is found that 11 students perceive themselves as severely underweight, 32 students perceive themselves as underweight, 90 students perceive themselves as normal, 82 students perceive themselves as overweight, and 7 students perceive themselves as obese. The majority of students intake perceive their body weight as normal.

The average result of the body weight perception congruency indicates that students can perceive their nutritional status correctly, aligning with the measurement results. Out of all students who misperceive their nutritional status, 74 individuals perceive themselves as overweight, and 32 individuals perceive themselves as underweight.

4. Discussion

In this study, it was found that 70.7% of students have a normal Body Mass Index (BMI) with an average BMI value of 21.58±3.6. This is consistent with research conducted on medical students in the city of Cluj-Napoca with the same number of respondents, which found an average BMI of 21.3±3.3.[9] The results showing that 7.7% of students are classified as obese align with a study at Northern Border University which found an obesity prevalence among medical students of 8.4%.[10] According to research conducted on medical students in Lahore, students classified as obese tend to have higher daily calorie intake. This study also indicates that medical students have low levels of physical activity.[11] Furthermore, the prevalence of students with underweight and severely underweight BMI, amounting to 15.4%, is consistent with research in China which found that 14.8% of students have below-normal BMI.[12] Based on research conducted among adolescents from two districts in Indonesia, data shows that one out of ten Indonesian adolescents experiences malnutrition. This condition is caused by various factors, including individual, household, and community factors.[13,14]

The demanding schedule of medical students may lead to a lack of time for exercise, resulting in low levels of physical activity that can affect their nutritional status. Generally, medical students have good socioeconomic status and educational backgrounds. Good socioeconomic status and educational history are associated with an increased prevalence of obesity.[15] Additionally, the workload of medical students, which includes rigorous coursework and tight exam schedules, can cause stress. Stress also affects one's nutritional status. This is supported by research conducted at a hospital in China which found a correlation between malnutrition and stress conditions.[16]

Based on the average nutrition knowledge score, students can answer 45.5% of all questions correctly. The lowest correct response rate is 0%, while the highest is 80%. This is quite different from research conducted on students in Uganda, where the average correct response rate to the GNKQ questionnaire was 88.2%.[17] A study involving nutrition and English language students also yielded different results. Nutrition students were able to answer the GNKQ questionnaire correctly at an average rate of 79.3%, while English language students scored 67.7%.[8] Another study conducted on first-year medical students using a different questionnaire also showed different results. This study used a nutrition knowledge questionnaire adapted from one commonly used by internship doctors. The average correct response rate among first-year medical students was 69.5%.[18] The differences in nutrition knowledge results are influenced by Body Mass Index (BMI), gender, formal education level, and media exposure.[19] Lack of nutritional knowledge among medical students can limit their ability to provide effective nutrition counselling and dietary recommendations to patients, thus leading to suboptimal management of nutrition-related conditions.[20]

The results of the body weight perception assessment indicate that 52.3% of students can accurately perceive their body weight. This is similar to research conducted in Malaysia, where over half of the respondents, approximately 54.2% of students, were able to perceive their body weight according to their actual Body Mass Index (BMI).[21] Another study conducted on medical and nursing students at a university in India also showed similar results, where 55.5% of students were able to accurately perceive their body weight, 38.3% perceived their body weight incorrectly according to their BMI, and the rest answered "don't know".[22] Examinations conducted revealed that 33.3% of students perceive their body weight to be greater than their actual measurements. Additionally, 14.4% of students perceive their body weight to be lower than their actual measurements. These results differ from previous studies, which showed that 23.4% of students perceive their body weight to be higher and 57.5% perceive their body weight to be lower than their actual measurements.[23]

Various factors influence misperceptions of body weight. Among adolescents, psychological health status affects errors in perceiving body weight.[24] Furthermore, misperceptions of body weight are also associated with eating habits or dietary patterns.[25] Research on students conducted in 21 countries showed that gender, poor health status, lack of awareness of the risks of various diseases due to being overweight, lack of desire to lose weight, not dieting, and poor dietary habits, such as skipping breakfast, are factors associated with perceiving body weight as lower than actual measurements.[26] Misperception of body weight in this study is attributed to the fact that these students are new students who have not received nutritional information on how to correctly measure Body Mass Index (BMI). This is evidenced by the M-GNKQ questionnaire related to BMI given to students. The results show that only 53.5% and 38.29% of students were able to answer these questions correctly. Some approaches can be made to improve nutritional knowledge among medical students, such as the utilization of interactive teaching methods (group discussions, case studies, role-playing).[27]

5. Conclusion

The majority of students have normal nutritional status, but there are a small number of students who experience problems such as obesity or underweight. Their level of nutritional knowledge is still relatively low. Protein consumption is one of the least understood aspects of nutritional knowledge, while water consumption is the most understood aspect. In addition, there is a mismatch between the perception of body weight and actual nutritional status. There are still some who perceive their weight by exaggerating or reducing. This is due to the lack of knowledge on how to measure body mass index correctly, reflected in the low percentage of correct answers to questions about BMI in the nutrition knowledge questionnaire. Therefore, efforts are needed to improve nutrition knowledge and understanding of body weight among new medical students. This will increase students' awareness and understanding of nutrition and health.

7. References

1. Wijayanti N. Fisiologi Manusia dan Metabolisme Zat Gizi. Malang: UB Press; 2017.
2. Sirirassamee T, Phoolsawat S, Limkhunthammo S. Relationship between body weight perception and weight-related behaviours. J Int Med Res. 2018;46(9):3796–808.
3. Shin A, Nam CM. Weight perception and its association with socio-demographic and health-related factors among Korean adolescents. BMC Public Health. 2015;15(1):1–9. Available from:
4. Shagar P., Shakiba N, Rahmah M. Factors Associated With Misperception of Own Weight Status among 18-21 Year Old University Students. IOSR J Nurs Heal Sci. 2014;3(5):25–31.
5. Naeeni MM, Jafari S, Fouladgar M, Heidari K, Farajzadegan Z, Fakhri M, et al. Nutritional knowledge, practice, and dietary habits among school children and adolescents. Int J Prev Med. 2014;5(2):S171–8.
6. Worsley A, Wang WC, Byrne S, Yeatman H. Different patterns of Australian adults' knowledge of foods and nutrients related to metabolic disease risk. J Nutr Sci. 2014;3:20–5.
7. Brumboiu MI, Cazacu I, Zunquin G, Manole F, Mogosan CI, Porrovecchio A, et al. Nutritional status and eating disorders among medical students from the Cluj-Napoca University centre. Med Pharm Reports. 2018;91(4):414–21.
8. Mehmood Y, Al-Swailmi FK, Al-Enazi SA. Frequency of obesity and comorbidities in medical students. Pakistan J Med Sci. 2016;32(6):1528–32.
9. Khan ZN, Assir MZ, Shafiq M, Chaudhary AEG, Jabeen A. High prevalence of preobesity and obesity among medical students of Lahore and its relation with dietary habits and physical activity. Indian J Endocrinol Metab. 2016;20(2):206–10.
10. Ren X, Chen Y, He L, Jin Y, Tian L, Lu M, et al. Prevalencia de bajo peso, el sobrepeso y la obesidad en estudiantes universitarios de la región de Anhui (China). Nutr Hosp. 2015;31(3):1089–93.

11. Assefa H, Belachew T, Negash L. Socio-demographic factors associated with underweight and stunting among adolescents in Ethiopia. Pan Afr Med J. 2015;20:252.

12. Maehara M, Rah JH, Roshita A, Suryantan J, Rachmadewi A, Izwardy D. Patterns and risk factors of double burden of malnutrition among adolescent girls and boys in Indonesia. PLoS One. 2019;14(8):15–8.

13. Jayawardena R, Byrne NM, Soares MJ, Katulanda P, Hills AP. Prevalence, trends and associated socio-economic factors of obesity in South Asia. Obes Facts. 2013;6(5):405–14.

14. Zhu C, Wang B, Gao Y, Ma X. Prevalence and relationship of malnutrition and distress in patients with Cancer using questionnaires. BMC Cancer. 2018;18(1):1–6.

15. Bukenya R, Ahmed A, Andrade JM, Grigsby-Toussaint DS, Muyonga J, Andrade JE. Validity and reliability of general nutrition knowledge questionnaire for adults in Uganda. Nutrients. 2017;9(2):1–11.

16. Kliemann N, Wardle J, Johnson F, Croker H. Reliability and validity of a revised version of the General Nutrition Knowledge Questionnaire. Eur J Clin Nutr. 2016;70(10):1174–80.

17. Hargrove EJ, Berryman DE, Yoder JM, Beverly EA. Assessment of nutrition knowledge and attitudes in preclinical osteopathic medical students. J Am Osteopath Assoc. 2017;117(10):622–33.

18. Valmórbida JL, Goulart MR, Busnello FM, Pellanda LC. Nutritional knowledge and body mass index: A cross-sectional study. Rev Assoc Med Bras. 2017;63(9):736–40.

19. Badrin S, Daud N, Ismail SB. Body weight perception and weight loss practices among private college students in Kelantan state, Malaysia. Korean J Fam Med. 2018;39(6):355–9.

20. Vijayalakshmi P, Thimmaiah R, Reddy SSN, Kathyayani B V., Gandhi S, BadaMath S. Gender differences in body mass index, body weight perception, weight satisfaction, disordered eating and Weight control strategies among Indian Medical and Nursing Undergraduates. Investig y Educ en Enferm. 2017;35(3):276–84.

21. Radwan H, Hasan HA, Ismat H, Hakim H, Khalid H, Al-Fityani L, et al. Body mass index perception, body image dissatisfaction and their relations with weight-related behaviors among university students. Int J Environ Res Public Health. 2019;16(9).

22. Riahi R, Motlagh ME, Heshmat R, Qorbani M, Daniali SS, Kelishadi R. Body Weight Misperception and Psychological Distress Among Children and Adolescents: The CASPIAN-V Study. Osong Public Health and Research Perspectives 2019;10(5):315–24.

23. Sonneville KR, Thurston IB, Miliren CE, Gooding HC, Richmond TK. Weight misperception among young adults with overweight/ obesity associated with disordered eating behaviors. Int J Eating Dis.. 2016; 49(10): 937-46.

24. Peltzer K, Pengpid S. Underestimation of weight and its associated factors in overweight and obese university students from 21 low, middle and emerging economy countries. Obes Res Clin Pract. 2015;9(3):234–42.