E-ISSN : 3063-2269
WEBSITE: HTTPS://JHSR.SABDAEDUPRESS.ORG
JHSR JOURNAL OF HEALTH SCIENCE REVIEW

Article

COMPARISON OF VEGETARIANS AND NON-VEGETARIANS IN BODY MASS INDEX INDICATORS AND CHOLESTEROL LEVELS

Helen Sabatini Simbolon[1], Yunus Elon[2]

[1]Faculty of Nursing, Indonesian Adventist University, Bandung
[2]Faculty of Nursing, Indonesian Adventist University, Bandung

SUBMISSION TRACK

Recieved: Jul 02, 2024
Final Revision: Aug 03, 2024
Available Online: Oct 07, 2024

FOR ABSTRACTS START WITH KEYWORDS

Body Mass Index, Cholesterol Levels, Students

CORRESPONDENCE

Email: yunus.elon@unai.edu

ABSTRACT

Background: Nutritional status of adults can be seen simply by using body mass index, and especially nutritional status related to vegetarian and nonvegetarian dietary status.**Objective:** This study aimed to assess the cholesterol levels and BMI of Adventist University Indonesia students. Methods: Using Spearman's rho test, this research technique is quantitative. There were 60 participants who voluntarily gave their consent. The tool used in this study is a lipid profile (measuring tool for cholesterol levels), **Results:** the study showed that there was no relationship between gender and BMI. While there is a significant relationship to dietary status and cholesterol levels with a unidirectional positive value (p = .000 r = .578).

I. INTRODUCTION

Body mass index (BMI) is a method of measuring body weight for height and is calculated using the method of body weight in kilograms divided by height squared (kg/m^2). (Access, 2021). The reason for increasing BMI is an energy imbalance between food consumed and energy expended. In general, there is an intake of high-energy foods high in fat and sugar and low levels of physical activity. Physical activity is movement produced by skeletal muscles that requires energy expenditure. (Febriyanti et al., 2017). Multinational Monitoring of Trend Determinants in Cardiovascular Diseases researchers suggest that weight gain may be associated with increased serum cholesterol. Each increase is 1gk/m^2 Body mass index (BMI) is associated with plasma total cholesterol of 7.7 mg/dl and a decrease in HDL of 0.8 mg/dl. Regulation of cholesterol metabolism is normal if the amount of cholesterol in the blood is sufficient and does not exceed the amount needed by the body. (Shabah & Dhanny, 2021).

Low levels of physical activity can cause energy to accumulate in the body in the form of fat. Increased BMI is an important risk factor for chronic diseases such as cardiovascular disease (heart and stroke), diabetes, musculoskeletal disorders and malignancies. (Febriyanti et al., 2017). Cholesterol is a complex problem in the human body. Narrowing and stiffness of the blood vessel walls due to the buildup of cholesterol in the blood vessels can cause blood pressure to increase. (Solikin & Muradi, 2020).

Health awareness and education are needed to reduce the number of people suffering from hypercholesterolemia or blood cholesterol levels that are too high Hypercholesterolemia itself usually does not show any special symptoms. Usually someone only finds out that they have hypercholesterolemia when they have a health check or because they have symptoms that interfere with their activities. Common symptoms are dizziness in the back of the head, tingling in the hands and feet, and shoulder pain. Increased cholesterol levels are also caused by several factors, including lack of exercise, obesity and poor diet. (Dana & Maharani, 2022)

Non-communicable diseases (NCDs) are diseases that are not caused by bacterial infections. The NCD category includes stroke, coronary heart disease, cancer, diabetes, chronic obstructive pulmonary disease (COPD) and diseases resulting from accidents and violence. One of the causes of PTM is hypercholesterolemia, a lipid metabolism disorder characterized by an increase in total blood cholesterol. If excess cholesterol in the blood easily sticks to the walls of blood vessels. The cause of increased blood cholesterol is regular consumption of foods high in saturated fat or high cholesterol. (Setyaningrum et al., 2019).

The vegetarian lifestyle is increasing from year to year. The vegetarian diet has become a diet that is very popular with many people today. Vegetarians are people who support themselves by eating only plant foods with or without milk and eggs, but vegetarians generally avoid eating meat, poultry and seafood.

One way to prevent blood cholesterol from rising is to switch to a vegetarian diet. Researcher Rossell (2004) around 1,033 postmenopausal women in England showed that consuming soybeans can lower blood cholesterol. A vegetarian diet is high in unsaturated fats, fiber, antioxidants and low in cholesterol. Health benefits include preventing and protecting the body from various chronic diseases. Vegetarians and non-vegetarians still consume animal products, namely eggs, milk and processed products, while pure vegetarians completely avoid animal products and follow a plant-based diet. Based on the background above regarding body mass index and cholesterol levels in Vegetarian and Non-Vegetarian Students at Indonesian Adventist University, the following problem formulation can be proposed;

The aim of this research was to determine the relationship between body mass index and cholesterol levels in vegetarian and non-vegetarian students at Indonesian Adventist University.

II. METHODS

The method used in this research is quantitative, and uses a correlation test *uji T-Test* the aim of which is to see the relationship between one variable and other variables (Suhron, 2024). Before carrying out the research, the researcher had obtained ethical qualifications from KEPK FIK UNAI with a letter number 278/KEPK-FIK.UNAI/EC/II/23 The population of this study were students at Indonesian Adventist University. The sampling technique used in this research was simple random sampling, so that the sample obtained was 60 people. The measuring instrument used is, for the body mass index instrument it is measured by BMI = BB (kg)/TB (m^2) with the following classification;

Classification	Body Mass Index
Which ones	<18,5
Normal	18,5 – 22,9
Fat	>23
Risky	23-24,9
Obesity	25-29,9

Sumber: (Acces, 2021).

The research was carried out at the Indonesian Adventist University. Variables in this study included BMI, diet status and cholesterol levelsl. Data processing was carried out using SPSS software.

III. RESULT

Descriptive statistics based on gender, diet status and BMI

Table 1.

Descriptive statistics based on gender, diet status and BMI

Variable	Frequency	%
Gender		
Woman	30	50,0
Man	30	50,0
State diet		
Vegaterian	30	50,0
Nonvegaterian	30	50,0
IMT		
Which ones	5	8,3
Normal	46	76,7
Fat	5	8,3
Obesity	4	6,7

Source: primary data

Table I. shows the sample criteria for the research. Criteria based on gender are balanced between men and women as many as 30 people (50%). Likewise, with the distribution of dietary status, the sample distribution was balanced between vegetarians and non-vegetarians, consisting of 30 male students, 15 vegetarians and 15 non-vegetarians. 30 female students including 15 vegetarians and 15 non-vegetarians. Based on the BMI criteria, the research data showed that the number of thin students was 5 people (8.3%), 46 normal students (76.7%), 5 fat students (8.3%), and 4 fat students (6, 7%).

Table 2.

Description of Cholesterol levels for vegetarian and non-vegetarian subjects.

State Diet	n	Mean	sd	Sig-2tailed
Vegeta	30	206.20	42.3	.026
Non-Vegetarian	30	268.83	49.1	

Source: primary data

Table 2 shows that the cholesterol levels in students with vegetarian status, totaling 30 respondents, had an average value of 206.20 (42.3). while the 30 respondents with non-vegetarian status had an average value of 268.83 949.1). Meta-analysis of 30 observational studies and 19 clinical trials shows that vegetarian diets are associated with lower cholesterol levels compared to non-vegetarians. (Lathifah Nudhar, 2018)

Table 3.
Correlation of cholesterol levels, against Body Mass Index with Gender, Diet Status

Variable	IMT		Gender		State Diet	
up to cholesterol	**p**	**r**	**p**	**r**	**p**	**r**
	.051	.697	.147	.261	.578	.000

Source: primary data

Table III shows that there is no relationship between cholesterol levels and BMI with research results (p.051) (r.697). A study proves the effectiveness of a vegetarian diet in reducing total cholesterol. A collaborative study of 11 clinical studies showed that a vegetarian diet lowered cholesterol, also proving that total cholesterol levels were lower. A meta-analysis of 30 observational studies and 19 clinical studies found that vegetarian diets were associated with higher cholesterol levels than non-vegetarians. (Lathifah Nudhar, 2018). Contrary to research results which state that obesity is related to BMI and body fat, and total cholesterol is positively related to waist circumference, but has a negative relationship with body fat. (Zhou et al., 2020).

Relationship between cholesterol levels and gender. The data results stated that there was no relationship between cholesterol and gender. The results of research in the male and female groups stated that the data was not normally distributed (p.147) (r.261). In general, there is no relationship between cholesterol and gender in Indonesian Adventist University students. According to the researcher, the daughter explains that the majority of increases in cholesterol levels occur in women rather than men because women go through menopause. (Princess, 2020).

Relationship between cholesterol levels and diet status. Blood cholesterol levels are influenced by daily food consumption. Consuming fatty foods increases cholesterol levels by 30.8%. The research results showed that (p .57.8) and (r .000) did not have a relationship between cholesterol levels and diet status (Khotimah, 2017)

IV. DISCUSSION

This research was conducted in February 2023 on 60 students. Sample characteristics based on BMI, cholesterol levels, gender. The hormone estrogen plays an important role in balancing the body's cholesterol levels by limiting free fatty acids from returning to the liver. The liver also plays a role in re-oxidizing free fatty acids, which will result in an increase in LDL in the body. (Sinurat & Elon, 2019)

Based on this research, it was found that there is a relationship between body mass index and cholesterol levels in vegetarians and non-vegetarians.

The relationship between body mass index and cholesterol levels.

The number of samples studied was 60 students. The statistical test results show p= .000 and r= .578, which means there is no significant relationship between body mass index and cholesterol levels. The results of the study showed that 5 people had normal cholesterol levels and a thin BMI, 46 samples had normal cholesterol levels and a normal BMI, 5 samples had obese cholesterol levels, and 4 people had obese cholesterol levels. The condition of a high BMI is not always balanced by high cholesterol levels, because BMI measurement is based on body height and weight so that a high BMI does not necessarily mean that the cholesterol is high. A person's

weight is not influenced by body mass but also by the muscle mass in the body. (Ryandini & Kristiyawati, 2022).

Data obtained from test subjects showed changes in the physical activity levels of Indonesian Adventist University students. Changes in physical activity and reduced frequency of exercise cause the existing cholesterol not to go through all the metabolic and burning processes, as a result the existing cholesterol accumulates in the blood vessels. There are indications that women do not respond as quickly as men in increasing HDL through exercise. Generally, as adults age, activity decreases, lean body mass decreases, while fat tissue increases. (Ahnia, 2022)

Apart from lack of physical activity, unhealthy and more practical eating patterns such as fast food and junk food which are usually high in fat and low in fiber also influence the emergence of hypercholesterolemia. One of these impacts can cause cholesterol levels in the body which can trigger various health problems. Diet is a very important behavior in influencing nutritional conditions. (Saputri & Novitasari, 2021)

V. CONCLUSION

There is a significant relationship between vegetarian and non-vegetarian samples, where the cholesterol levels of non-vegetarian samples are higher than those of non-vegetarians. Meanwhile, there is no significant relationship for body mass index and gender.

REFERENCES

1. Access, O. (2021). *Open Acces*. *02*(04), 1094–1097.
2. Ahnia, S. (2022). The relationship between food intake, physical activity and nutritional status with blood cholesterol levels for pre-elderly and elderly people in the Losari Community Health Center Working Area. *Scientific Journal of Nutrition and Health (JIGK)*, *4*(01), 36–44.
3. Blum, C. B., Levy, R. I., Eisenberg, S., Hall IIIrd, M., Goebel, R. H., & Berman, M. (1977). High density lipoprotein metabolism in man. *Journal of Clinical Investigation*, *60*(4), 795–807. https://doi.org/10.1172/JCI108833
4. Dana, Y. A., & Maharani, H. (2022). Relationship between Body Mass Index and Cholesterol Levels in Kudus Polytechnic Employees and Students. *Florona: Health Scientific Journal*, *1*(1), 1–9.
5. Febriyanti, N. K., Adiputra, I. N., & Sutadarma, I. W. G. (2017). Relationship between Body Mass Index and Physical Activity in Students at the Faculty of Medicine, Udayana University. *Erepo Unud*, *831*, 1–14.
6. Khotimah, S. K. (2017). *The relationship between fat intake and nutritional status with cholesterol levels at the Posyandu for the Elderly in Sugihan Village, Boyolali*. 1–101. http://repository.itspku.ac.id/id/eprint/224
7. Lathifah Nudhar. (2018). *DIFFERENCE IN AVERAGE TOTAL CHOLESTEROL LEVELS BETWEEN VEGETARIAN AND NONVEGETARIAN GROUPS AT MAHA VIHARA MAITREYA DUTA PALEMBANG* (Vol. 6, Issue 1). http://journals.sagepub.com/doi/10.1177/1120700020921110%0Ahttps://doi.org/10.1016/j.reuma.2018.06.001%0Ahttps://doi.org/10.1016/j.arth.2018.03.044%0Ahttps://reader.elsevier.com/reader/sd/pii/S1063458420300078?token=C039B8B13922A2079230DC9AF11A333E295FCD8
8. Putri, N. A. (2020). *Systematic Review: Influence Factors on Total Cholesterol Levels in Obese Patients in Indonesia*.
9. Ryandini, F. R., & Kristiyawati, P. (2022). The relationship between body mass index and total cholesterol levels in patients with coronary heart disease. *Rafflesia Partner Journal*, *14*(1), 1–10.
10. Saputri, D. A., & Novitasari, A. (2021). Relationship between consumption patterns and community cholesterol levels in Bandar Lampung City. *Science and Application Science Journal Porch*, *IX*(1), 8–22.
11. Setyaningrum, R. A., N. Susanto, H. Yuningrum, & N. A. P. Wati. (2019). Factors Associated with Hypercholesterolemia in Kopat Hamlet, Karangsari Village, Pengasih District, Kulon Progo Regency, DIY. *UNRIYO National Seminar*, 1–11. http://prosiding.respati.ac.id/index.php/PSN/article/view/7/4. accessed on April 14 2021.
12. Shabah, Z. M., & Dhanny, D. R. (2021). Body Perception and Bulimia Nervosa in Adolescent Girls. *Muhammadiyah Journal of Nutrition and Food Science (MJNF)*, *1*(2), 48. https://doi.org/10.24853/mjnf.1.2.48-53
13. Sinurat, R. G., & Elon, Y. (2019). Relationship between BMI and Total Blood Cholesterol Levels in Adult Women. *Nurse Journal*, *3*(2), 21. https://doi.org/10.37771/nj.vol3.iss2.406
14. Solikin, S., & Muradi, M. (2020). The Relationship Between Cholesterol Levels and the Degree of Hypertension in Hypertensive Patients at the Sungai Jingah Community Health Center. *Human Asylum Nursing Journal (Jksi)*, *5*(1), 143–152. https://doi.org/10.51143/jksi.v5i1.230

15. Suhron, M. 2024. Public Health Epidemiology Research Book. SABDA EDU PRESS.
16. Zhou, Yang, & Wang. (2020). Based on this research, it was found that there is a relationship between body mass index and cholesterol levels in vegetarians and non-vegetarians. The relationship between body mass index and cholesterol levels. The number of samples studied was 60 students. With the sta test results. *File:///C:/Users/VERA/Downloads/ASKEP_AGREGAT_ANAK_and_REMAJA_PRINT.Docx*, *21*(1), 1–9.