MEDALION JOURNAL: Medical Research, Nursing, Health and Midwife Participation | ISSN(e): 2986-7754
Volumes 6 No. 2 (2025)

THE RELATIONSHIP OF FAST FOOD AND FIBER INTAKE WITH CHOLESTEROL LEVELS IN THE 2021 BATCH OF NUTRITION PROGRAM STUDENTS TEUKU UMAR UNIVERSITY

Dira Rulia Partisa[1]*, Itza Mulyani[2], Teuku Muliadi[3], Nasrianti Syam[4]
[1,2,3,4]Universitas Teuku Umar, Meulaboh
Corresponding E-mail: dirarulia93@gmail.com [1]*,itzamulyani@utu.ac.id [2],

Received	: 21 March 2025	Published	: 28 May 2025
Revised	: 30 March 2025	DOI	: https://doi.org/10.59733/medalion.v6i2.191
Accepted	: 15 April 2025	Link Publish	: https://medalionjournal.com/index.php/go

Abstract

Cholesterol is a fat compound produced by the body and also found in animals. There are two types of cholesterol that play a role in various body functions, namely LDL (Low Density Lipoprotein) and HDL (High Density Lipoprotein). This study aims to determine the relationship between fast food and fiber intake and cholesterol in nutrition students class of 2021 at Teuku Umar University. This research uses quantitative methods with a cross sectional design. The sample selected was 52 people from 164 populations using simple random sampling technique. Data was collected by distributing food frequency questionnaires and 24 hour food recalls. Data analysis used the chi square test with a significance level of α= 0.05. Results: there was a relationship fast food consumption and cholesterol levels (p = 0.008), fiber intake did not relationship with cholesterol levels (p = 1.000). Conclusion: fast food consumption is related to cholesterol levels, and fiber intake and cholesterol levels are not related. It is recommended to reduce excessive intake of fast food and adopt a healthy and nutritious intake.

Keywords: ***cholesterol, fast food, fiber***

INTRODUCTION

Cholesterol is a component involved in fat formation, produced by the liver and derived from saturated fats in food. An increase in blood cholesterol levels exceeding 200 mg/dL in adults over the age of 18 is influenced by a high-fat diet, obesity, low fiber intake, smoking habits, physical inactivity, and gender (Ministry of Health, 2017). Elevated cholesterol levels can inhibit blood circulation and increase the risk of cardiovascular diseases such as heart disease, stroke, and potentially lead to death (Sari et al., 2024). Excessive cholesterol can also increase the risk of atherosclerosis, coronary heart disease, pancreatitis, diabetes mellitus, thyroid disorders, and liver and kidney diseases (Misbahussurur, 2015).

According to data from the World Health Organization (WHO), cholesterol is estimated to cause 2.6 million deaths (4.5% of the total). It is a major contributor to disease burden in both developed and developing countries, primarily through its role in cardiovascular diseases such as heart attacks and strokes. In 2018, the global average of total cholesterol for both men and women was 4.5% (World Health Organization, 2018). In Southeast Asia, approximately 30% of the population has cholesterol levels exceeding the recommended threshold. In Indonesia, 35% of the population had elevated cholesterol levels in 2016 (Safitri et al., 2022). According to the Ministry of Health (2017), the prevalence of high cholesterol in Indonesia was 58.5% in 2015 and 52.5% in 2016. Furthermore, the 2018 National Basic Health Research (Riskesdas) reported that 28.8% of Indonesians over the age of 15 had elevated cholesterol levels (Aditianti et al., 2020). According to Indonesian Health Research (2023), a total of 829,573 individuals aged over 3 years consumed fatty, high-cholesterol, and fried foods. In the 20–24-year age group alone, 69,530 individuals consumed such foods. Based on the 2019 Aceh Health Profile, the prevalence of high cholesterol was 47.9%, with the highest rates found in West Aceh (13.4%), East Aceh (12.9%), Bireuen (10.6%), and Banda Aceh (9.8%) (Aceh, 2019).

Adolescents aged 15 to 21 years have demonstrated an increasing trend in fast food consumption. This rise is influenced by various factors, including lifestyle changes, technological advancements, and cultural value shifts, all of which significantly affect dietary behaviors. These conditions contribute to more frequent fast food consumption among adolescents, as such foods typically contain high levels of fat and cholesterol, posing potential long-term health risks (Mentari, 2019). This observation aligns with the findings of (Wijaya et al, 2024),

who reported that excessive fast food intake may negatively impact health due to its unbalanced nutritional composition, particularly its high cholesterol content.

Many students living in dormitories have irregular eating patterns, including skipping or delaying meals, and often rely on fast food as a more practical alternative without considering its nutritional value (Pebriani et al., 2022). Research by Sari et al. (2024) indicates a correlation between fast food consumption and blood cholesterol levels among young adults, where respondents who frequently consumed fast food and sugary drinks, along with low fiber intake, had cholesterol levels ≥200 mg/dL. Additionally, the factors contributing to fast food consumption include technological, socioeconomic, and cultural influences (Hanafi et al., 2019).

Fast food varies from snacks to full meals and is typically low in fiber and high in salt (Putri et al., 2020). Lower fiber intake is associated with higher total cholesterol levels. Dietary fiber consists of plant cell wall remnants that are not digested by human digestive enzymes, including components such as hemicellulose, cellulose, lignin, oligosaccharides, gums, pectins, and waxes. Fiber plays a crucial role in lowering blood cholesterol levels. Regular fiber consumption has been shown to reduce cholesterol levels by 15–19% (Yuliantini et al., 2016). Based on a preliminary survey, cholesterol screenings were conducted on 15 students from the Nutrition Study Program. The results showed that 9 students had high cholesterol levels. This finding was also confirmed in a report from the 2021 cohort's Nutritional Status Assessment course, where 7 out of 11 students had high cholesterol levels. Based on this background, the researcher is interested in examining the relationship between fast food consumption, fiber intake, and cholesterol levels among 2021 students of the Nutrition Study Program at Teuku Umar University.

LITERATURE REVIEW

1. Cholesterol

Cholesterol is an essential lipid involved in the structure of cell membranes and serves as a key component of the nervous system. Approximately 70% of the cholesterol present in the human body is synthesized by the liver, while the remaining portion is derived from dietary sources (Permata, 2018). In the bloodstream, cholesterol is transported by lipoproteins, including low-density lipoprotein (LDL), commonly referred to as "bad" cholesterol; high-density lipoprotein (HDL), known as "good" cholesterol; and triglycerides (Ayuda, 2024).

HDL plays a protective role by transporting excess cholesterol from blood vessels back to the liver for elimination (Diana, 2020). Conversely, elevated LDL levels may lead to arterial blockages due to its tendency to infiltrate the walls of blood vessels (Putri, 2019). Triglycerides are a form of fat that functions as an energy reserve and contributes to lipid metabolism (Setiawan et al., 2017). Total cholesterol encompasses the combined levels of LDL, HDL, and triglycerides in the bloodstream and serves as a key indicator in assessing cardiovascular disease risk (Ekayanti, 2020). Several risk factors are associated with elevated cholesterol levels, including obesity, genetic predisposition, physical inactivity, smoking habits, aging, gender, and poor dietary habits (Mulyani et al., 2018). Consumption of foods rich in saturated fats, such as fast food, is a direct contributor to increased LDL cholesterol levels (Agustiyanti et al., 2017).

2. Fast Food

Fast food refers to a category of ready-to-eat meals that are widely consumed due to their convenience, affordability, and quick preparation. However, such foods are typically high in saturated fats, sodium, and calories, while lacking adequate fiber and essential micronutrients (Amalia et al., 2020). Excessive fast food consumption has been linked to a higher risk of developing obesity, diabetes mellitus, hypertension, and dyslipidemia. Common examples include fried chicken, instant noodles, hamburgers, French fries, and fritters—most of which are prepared using deep-frying techniques and are high in fat content (Amalia, 2018).

Factors influencing fast food consumption include individual preferences (convenience), economic considerations (price and allowance), social influences (peer pressure), and environmental factors (accessibility and media exposure) (Abel et al., 2024). Aggressive marketing through social media and television also significantly shapes adolescents' preferences for fast food (Halid & Sudargo, 2016).

3. Dietary Fiber

Dietary fiber refers to plant-based substances that cannot be digested by human digestive enzymes. Based on solubility, dietary fibers are categorized into soluble and insoluble types (Yuliantini et al., 2016). Soluble fiber helps regulate blood cholesterol and glucose levels, whereas insoluble fiber facilitates digestive processes. According to the 2019 Recommended Dietary Allowance (RDA), the suggested daily intake of fiber is 30–37 grams for men and 29–32 grams for women, depending on age (Ministry of Health, 2019).

Fiber offers a wide range of health benefits, including promoting digestive health, supporting weight management, lowering blood cholesterol, enhancing immune function, and maintaining blood glucose stability

(Wahyuni, 2022). Dietary fiber can be sourced from vegetables, fruits, and legumes, which are considered essential components of a balanced and nutritious diet (Cleverdon, 2016).

METHOD

This research uses a quantitative approach by design cross-sectional, involving 52 students as a sample selected randomly from a population of 164 students. The independent variables were fast food consumption and fiber intake. The dependent variable is total cholesterol levels.The research was carried out on the Teuku Umar University campus on October 28 2024. Data collected through questionnaires and blood test tools were analyzed using chi square with a significant α=0.05 to test the relationship between the independent and dependent variables.

RESULTS AND DISCUSSION

1. Univariat

The results of the frequency distribution indicate that the majority of respondents were between the ages of 21 and 25 years (84.6%), while the smallest proportion was between the ages of 18 and 20 years (15.4%). Consequently, the average age of the respondents fell within the range of 21 to 25 years. The results of the cholesterol level examination indicated that 29 respondents (55.8%) exhibited elevated cholesterol levels, while 23 respondents (44.2%) demonstrated normal cholesterol levels. With respect to the frequency of fast food consumption, 20 students (38.5%) were classified as "rare," while 32 students (61.5%) were classified as "frequent." With respect to fiber intake, only 6 students (11.5%) met the recommended intake, while the majority, 46 students (88.5%), did not meet the recommended level of fiber intake.

2. Bivariate Analysis

The analysis indicates that 23 students with high cholesterol levels frequently consume fast food, constituting (44.2%) of the sample. The statistical test results show a P value of 0.008 (≤ 0.05), which indicates a significant relationship between fast food consumption and cholesterol levels in students. Concurrently, 26 students (50.0%) exhibited high cholesterol levels, yet their fiber consumption did not align with the recommended category. The statistical test results for this variable show a P value of 1.000 (≤ 0.05), which indicates that there is no significant relationship between fiber consumption and cholesterol levels in 2021 nutrition study program students at Teuku Umar University.

3. Discussion

The findings of the research indicate that 23 students (44.2%) who frequently consume fast food exhibit elevated cholesterol levels, in contrast to 6 students (11.5%) who rarely consume fast food but nevertheless have high cholesterol levels. The findings of the statistical analysis, employing the chi-square test, indicated a P-value of 0.008 (P ≤ 0.05), thereby suggesting a substantial association between fast food consumption and cholesterol levels among students enrolled in the 2021 Nutrition study program at Teuku Umar University. This finding aligns with the results of research by (Tanto, 2024), which demonstrated that respondents who frequently consumed fast food exhibited higher cholesterol levels (126 people) compared to those who rarely consumed it (84 people). This phenomenon was further substantiated by the research conducted by Sari et al. (2024), which revealed that 67.4% of respondents with cholesterol levels ≥200 mg/dL exhibited a tendency to regularly consume fast food.

Fast food is a type of food that is characterized by its expeditious preparation and high fat content, with examples including fried chicken, hamburgers, kebabs, fried foods, and meatballs, which are typically made from processed meat, oil, and flour. Excessive consumption of fast food has been demonstrated to have a significant impact on health, increasing the risk of various degenerative diseases, including heart attack, diabetes, and obesity. The results indicated that 26 students (50.0%) with high cholesterol had fibre intake that did not meet the recommended requirements, while only 3 students (5.8%) with high cholesterol met the recommended fibre intake. A thorough examination of the data set using the Chi-square test revealed a P value of 1.000 (P ≤ 0.05).

This finding suggests that there is no statistically significant association between fibre intake and cholesterol levels. This outcome is potentially attributable to the relatively low fibre intake observed among the study participants. The results of this study were supported by (Dewi and Sugiyanto, 2020), who reported that the average dietary fibre intake in their study population was only 31.2% of the recommended RDA. This phenomenon was further compounded by the low consumption of fruits and vegetables, which are recognised as the primary sources of dietary fibre. Numerous factors have been identified as contributing to elevated cholesterol levels, including age, genetics, gender, dietary fat and cholesterol intake, diabetes, smoking, thyroid hormone deficiency and obesity.

Concurrently,(Pertiwi et al, 2020) discovered no substantial correlation between fibre intake and cholesterol levels, as evidenced by a P value of 1,000. Cholesterol levels are influenced by a multitude of factors. Among these, genetic factors, age and gender are considered to be immutable. The absence of a substantial correlation may be ascribed, at least in part, to the propensity of the respondents to consume insoluble fibre sources, such as wheat flour and legumes, in preference to soluble fibre sources, including fruits such as bananas, carrots, and mustard greens. Furthermore, insufficient fibre intake can result in elevated cholesterol levels, underscoring the importance of adequate fibre consumption in achieving and maintaining optimal health parameters. Consequently, an imbalanced fibre intake can result in elevated cholesterol levels, which can be mitigated by adhering to a balanced and consistent diet that restricts the consumption of saturated fat and dietary cholesterol.

CONCLUSION

Conclusion

Based on research that has been conducted regarding fast food and fiber intake and cholesterol levels in nutrition study program students of 2021 at Teuku Umar University, it can be concluded as follows:

1. There is a relationship between the level of fast food consumption and total cholesterol in nutrition study program students class of 2021 at Teuku Umar University.
2. There is no relationship between fiber intake and total cholesterol in nutrition study program students class of 2021 at Teuku Umar University.

Suggestions

Suggestions for further research are to increase the research sample by involving several age groups and socio-economic backgrounds as well as other factors that can influence cholesterol levels such as physical activity, genetic factors in order to get more comprehensive and complete results.

REFERENCES

Abel D, Ambia N, Ully F, Kiki A, Reza K, (2023). Fast Food Consumption Behavior in Adolescents and Its Impact on Health. Public Health Journal, 3048-3581.

Aditianti, A., Raswanti, I., Sudikno, S., Izwardy, D., & Irianto, S. E. (2020). Prevalence and Risk Factors of Stunting in Toddlers 24-59 Months in Indonesia: Analysis of 2018 Basic Health Research Data (Prevalence And Stunting Risk Factors In Children 24-59 Months In Indonesia: Analysis Of Basic Health Research Data 2018). Nutrition and Food Research (The Journal of Nutrition and Food Research), 43(2), 51–64.

Agustiyanti, P.N., Pradigdo, S.F., Aruben, R. (2017a). "Relationship of Food Intake, Physical Activity and Use of Hormonal Contraception with Blood Cholesterol Levels (Study of Women from Fishermen's Families Aged 30-40 Years in Tambak Lorok, Semarang, 2017). Public Health Journal (e-Journal), 5(4), 737–743.

Amalia, D. P., & Nurdiana, N. (2020). The Relationship Between Consumption Patterns and Physical Activity and Obesity in Students. Indonesian Journal of Nutrition and Dietetics, 8(2), 98–104.

Ayuda, S. (2024). Knowledge About Blood Cholesterol. Quoted from https://kms.kemkes.go.id/pengetahuan/detail/65ffe4b6f39f5219db2bc0f8.

Cleverdon, C. W. (2016). Review of the origins and development of research: 2. Information and its Retrieval. Aslib Proceedings, 22(11), 538–549. Quoted from https://doi.org/10.1108/eb050265

Diana, F. (2020). Relationship between fiber intake, cholesterol intake and nutritional status with total cholesterol levels in rubber workers at PT Batanghari Bengkulu Pratama, Kembang Seri Village, Central Bengkulu. Bengkulu Ministry of Health Polytechnic.

Ekayanti. (2020). Analysis of Total Cholesterol Levels in the Blood of Patients with a Diagnosis of Cardiovascular Disease. International Journal of Applied Chemistry Research, 1(1) 6–11.

Gem, M. (2018). The Relationship between Knowledge, Attitudes, Diet and Cholesterol Levels of Women of Childbearing Age (WUS) in Bangun Sari Baru Village, Tanjung Morawa District. Quoted from Http://Ecampus.Poltekkesmedan.Ac.Id/Xmlui/Handle/123456789/1069.

Halid, M., & Sudargo, T. (2016). Relationship between Socioeconomic Status and Fast Food Consumption Levels

in Adolescents. Quoted from Https://Doi.Org/10.20414/Jb.V9i1.37, 3(1), 74–85.

Hanafi, S., & Hafid, W. (2019). The relationship between physical activity and fast food consumption and the incidence of obesity in adolescents. Kampurui Public Health Journal (The Journal of Public Health), 1(1), 6–10.

Ministry of Health of the Republic of Indonesia. (2019). Regulation of the Minister of Health of the Republic of Indonesia Number 28 (2019). Recommendations for Nutritional Adequacy Rates for Indonesian People Quoted from https://peraturan.bpk.go.id/Details/138621/permenkes-no-28- tahun-2019

Mentari S. (2019). Community Behavior in Consuming Junk Food from an Islamic Consumption Perspective. Metro State Institute of Islamic Religion. Script. State Institute of Islamic Religion (IAIN) METRO.

Misbahussurur. (2015). The Relationship Between Consuming Fast Food and Increased Cholesterol in Adolescents at State High School (Sman) 2 Babelan Bekasi in 2015. Thesis. Nursing Study Program, Faculty of Nursing, Muhammadiyah University, Jakarta.

Mulyani, N.S., Al Rahmad, A.H., Jannah, R. (2018). Risk Factors for Blood Cholesterol Levels in Outpatients with Coronary Heart Disease at Meuraxa Regional Hospital. AcTion: Aceh Nutrition Journal, 3(2) Quoted from (https://doi.org/10.30867/action.v3i2.113.), 132–140.

Pebriani, L., Frethernety, A., & Trinovita, E. (2022). Literature Study: The Effect of Junk Food Consumption on Obesity. Surya Medika Journal, 8(2), 270–280.

Public health Office. (2019). Aceh Health Profile 2019,. Quoted from https://dinkes.acehprov.go.id/detailpost/profil-kesehatan-aceh-tahun-2019

Putri, L., Lusmilasari, L., & Haryanti, F. (2020). The Effect of Education Using Booklets on Parents' Knowledge in Caring for Overweight and Obese Children in Public Elementary Schools in the Working Area of Depok Ii Health Center, Sleman Regency, Yogyakarta. *Journal of Health Sciences*, *10*(1), 76–94.

Safitri, S., Mappahya, A., Nurhikmawati, Wisudawan, & Safitri, A. (2022). Relationship between risk factors for hypercholesterolemia in coronary outpatients at Ibnu Sina Hospital, Makassar. Medical Student Journal, *2*(5), 359–367.

Sari, H. P., Sulistyaning, A. R., Wicaksari, S. A., Putri, W. P., & Widyaningtyas, E. (2024). Associations of Fast-Food Consumption Patterns, Sugar-Sweetened Beverages, and Fibre Intake with Blood Cholesterol in Young Adult. Amerta Nutrition, *8*(2), 312–317.

Setiawan, B., Tri Widada, S., Sholikhah, I. (2017). Analysis of Triglyceride Levels in Junk Food Consuming Students at X Educational Institutions in Yogyakarta City in 2016. Proceedings of the IKAKESMADA National Seminar "The Role of Health Workers in Implementing SDGs, 33–39.

Wahyuni, P. (2022). The Importance of Consuming Food Sources of Fiber for Babies, Children and Adults. Ministry of Health Directorate General of Health Services, Quoted from https://yankes.kemkes.go.id/view_article/1838/cepatnya-konsumsi-makanan-source-serat-bagi- bayi-anak-anak-dan-orang-dewasa

Wijaya, N. V., Dahliah, & Pancawati, E. (2024). The Impact of the Habit of Consuming Junk Food on Body Weight. MAHESA: Malahayati Health Student Journal, 4(2), 455– 464.

Women of Childbearing Age (WUS) in Bangun Sari Baru Village, Tanjung Morawa District. Quoted from Http://Ecampus.Poltekkesmedan.Ac.Id/Xmlui/Handle/123456789/1069.

World Health Organization. (2018). Raised cholesterol. Quoted from Https://Www.Who.Int/Data/Gho/Indicator-Metadata-Registry/Imr-Details/3236. Accessed at 10.13 WIB Sunday 09 March 2025.

Yuliantini, E., Sari, A. P., & Nur, E. (2016). Correlation of Energy, Fat and Fiber Intake with the Total- Hdl Cholesterol Level Ratio. Nutrition and Food Research (The Journal of Nutrition and Food Research), *38*(2),139–147