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Research Article

A Correlational Study of Academic Stress Levels and Total Cholesterol in Students of the Medical Laboratory Technology Study Program, Kadiri University

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Abstract

Students in the Medical Laboratory Technology (MLT) Study Program at Kadiri University often experience academic stress due to assignments, examinations, and other academic demands. Such stress may affect physiological functions, including total cholesterol levels. This study aimed to examine the relationship between academic stress levels and total cholesterol levels among MLT students at Kadiri University. The research employed a quantitative, non-experimental, cross-sectional design. A sample of 29 students was selected using simple random sampling. Academic stress levels were assessed using the DASS-42 questionnaire, while total cholesterol levels were measured through laboratory testing. Results showed that 58.62% of respondents experienced moderate stress and 41.38% experienced high stress. Regarding cholesterol levels, 86.21% had normal levels (<200 mg/dL), and 13.79% had high levels (≥240 mg/dL), with no respondents in the borderline category. Pearson's correlation test yielded a p-value of 0.3313 ($p > 0.05$), indicating no significant relationship between academic stress levels and total cholesterol levels. The findings suggest that academic stress does not significantly influence total cholesterol levels among these students.

Keywords: total cholesterol, academic stress, students, correlation, physiology

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1 Introduction

Coronary heart disease (CHD) is one of the leading causes of death worldwide, resulting from narrowing or blockage of the coronary arteries, which disrupts blood flow to the heart muscle. This condition reduces the supply of oxygen and nutrients to the heart, potentially leading to serious complications such as myocardial infarction and sudden death. According to the World Health Organization (WHO) [1], CHD causes approximately 9 million deaths annually. In Indonesia, the prevalence of CHD is 1.5%, with the highest rates observed in the productive age group [2].

One major contributing factor to CHD is elevated blood cholesterol. Excess cholesterol can lead to plaque buildup in arterial walls, narrowing blood flow. Data from the Indonesian Ministry of Health [2] indicate that around 28% of Indonesians have high cholesterol levels, with a notable prevalence among young adults (ages 15–34). Unhealthy lifestyles, including poor diet, lack of physical activity, and psychological stress, play a significant role in increasing cholesterol levels [3].

Stress, including academic stress, has been shown to disrupt metabolic processes, partly through elevated cortisol levels, which can influence cholesterol metabolism. University students are a population vulnerable to academic stress due to the pressures of coursework, examinations, and practical training. Several studies have shown that severe academic stress can lead to behavioral changes such as unhealthy eating habits, reduced physical activity, and smoking, all of which can increase the risk of metabolic disorders, including dyslipidemia [4].

Students in the MLT Study Program have a high academic workload, which may contribute to sustained high stress levels. This stress can impact overall health, including total cholesterol levels. Therefore, this study aims to investigate the relationship between academic stress levels and total cholesterol levels among MLT students at Kadiri University, as an early effort to detect cardiovascular disease risk from a young age.

2 Method

This research employed an analytical observational design with a cross-sectional approach to determine the relationship between academic stress levels and total cholesterol levels among MLT students at Kadiri University. The study population consisted of all active students in the MLT Study Program. The sample was selected using purposive sampling based on predetermined inclusion and exclusion criteria: participants had to be willing to take part in the study, not currently using cholesterol-lowering medications, and free from certain chronic diseases. A total of 29 students met the criteria.

Data collection involved two instruments. Academic stress levels were measured using the Perceived Sources of Academic Stress (PSAS) questionnaire, originally developed by Bedewy and Gabriel and adapted into Indonesian by Ramadhani and Mastuti [5]. Total cholesterol levels were measured using a photometer.

Data were analyzed using appropriate correlation tests. If the data were normally distributed, Pearson's correlation was applied; otherwise, Spearman's correlation was used. Prior to this, normality and homogeneity tests were conducted. Statistical analysis was performed using SPSS version 24, with a 95% confidence level ($\alpha = 0.05$).

3 Result and Discussion

Table 1 shows that most respondents experienced moderate academic stress (58.62%), while the remainder experienced high stress (41.38%). Table 2 indicates that most respondents had normal total cholesterol levels (86.21%), and a small proportion had high levels (13.79%). Pearson's correlation analysis yielded $p = 0.313$ ($p > 0.05$), indicating no significant relationship between academic stress and total cholesterol levels.

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Table 1. Academic Stress Categories

Category	n	%
Low	0	0%
Moderate	17	58.62%
High	12	41.38%
Total	29	100%

Table 2. Total Cholesterol Levels

Category	n	%
Normal (<200)	25	86.21%
Borderline	0	0%
High (≥240)	4	13.79%
Total	29	100%

These results are consistent with previous studies showing that health science students tend to experience higher levels of stress compared to other majors due to their heavy academic workload, practical training, and exam demands [4]. High stress levels can influence physiological functions through increased cortisol secretion, which affects fat metabolism and blood lipid profiles.

The cholesterol findings showed that most respondents were within the normal range, consistent with the American Heart Association (AHA) classification (<200 mg/dL normal, 200–239 mg/dL borderline, ≥240 mg/dL high) [7]. This aligns with Firdaus et al. [3], who reported that student lifestyle factors such as diet and physical activity strongly influence cholesterol levels.

Statistical analysis indicated no significant correlation between academic stress levels and total cholesterol levels ($p = 0.313$). This finding agrees with Thristy et al. [6], who studied medical students and found no direct link between stress and cholesterol levels. While 71% of students experienced stress of varying degrees, over 45% had normal cholesterol, suggesting that stress alone may not elevate cholesterol in young adults with different lifestyles and adaptive metabolic regulation.

Other factors, including diet, exercise, sleep duration, and smoking habits, may have a greater influence on cholesterol variability. In this study, some respondents reported frequent consumption of fast food and sleeping less than seven hours per night, which could contribute to higher cholesterol levels independent of stress.

4 Conclusion

Most students experienced moderate (58.62%) or high (41.38%) academic stress, with no cases of low stress. The majority had normal total cholesterol levels (86.21%), and 13.79% were in the high category. Statistical analysis revealed no significant relationship between academic stress and total cholesterol levels ($p > 0.05$).

5 Declarations

5.1 Acknowledgements

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5.2 Author contributions

Novirma Yanti contributed to data collection and laboratory analysis. Lisa Savitri supervised the research design, coordinated data interpretation, and reviewed the manuscript. Dita Aprina Dwi Astuti was responsible for statistical analysis and discussion writing. Rochmad Krissanjaya assisted in literature

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review and manuscript editing. All authors approved the final version of the manuscript and agreed to be accountable for all aspects of the work

5.4 Ethics

This research was reviewed and approved by the Research Ethics Committee of the Faculty of Health Sciences, Kadiri University, Indonesia (Approval No.: 023/KEPK-FIKES/IX/2024). All respondents provided written informed consent before participation, and confidentiality of participant data was maintained throughout the study.

5.4 Conflict of Interest

The authors declare no conflict of interest.

5.5 Funding Statement

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