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# THE EFFECT OF ANANDA EXERCISE ON REDUCING BLOOD CHOLESTEROL LEVELS

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## ABSTRACT
Hypercholesterolemia is a major risk factor for cardiovascular disease, with a steadily increasing prevalence, including among productive age groups and the elderly. Physical activity is known to be effective in helping lower cholesterol levels, but most interventions still focus on physical aspects and fail to integrate positive psychological approaches such as happiness. ANANDA exercise is an innovative physical activity that combines exercise movements with a positive emotional state to improve cardiometabolic health. This study aims to analyze the effect of ANANDA exercise on reducing cholesterol levels in the blood. This study used a quantitative analytical experimental design with a pre-posttest design method. The study was conducted in April 2026 in Gemolong District, Sragen Regency. The study sample consisted of 60 respondents consisting of mothers and elderly people with high cholesterol levels, selected using a total sampling technique. The independent variable was ANANDA exercise, while the dependent variable was blood cholesterol levels. Data analysis was performed using a paired sample t-test. The results of the study showed a significant difference in cholesterol levels before and after the ANANDA exercise intervention. The average decrease in cholesterol levels was 13.535 mg/dL with a 95% CI of 10.374–16.693. The statistical test results showed a t value of 8.570 and p = 0.000 (p < 0.05), which indicates that ANANDA exercise is effective in reducing blood cholesterol levels. ANANDA exercise has a significant effect on reducing blood cholesterol levels and has the potential to be an innovative, holistic, easy-to-implement, and community-based non-pharmacological intervention in efforts to prevent cardiovascular disease.

Keywords: ANANDA exercise; cholesterol; happiness; hypercholesterolemia; physical activity

## INTRODUCTION
Cardiovascular disease (CVD) remains the leading cause of death worldwide and continues to show an increasing trend each year. Global data shows that approximately 18–20 million deaths per year are caused by cardiovascular disease, with the majority of cases occurring in developing countries (World Heart Federation, 2022). One of the main risk factors for this disease is hypercholesterolemia, a condition characterized by elevated blood cholesterol levels that significantly contributes to atherosclerosis and ischemic heart disease (Guo et al., 2025). This condition is a serious health concern due to its often-asymptomatic nature yet potentially fatal consequences.

Epidemiologically, the prevalence of lipid disorders, including hypercholesterolemia, remains quite high in various countries. A recent systematic review and meta-analysis showed that the global prevalence of hypercholesterolemia reached approximately 24.1% in the adult population (Ballena-Caicedo et al., 2025). In Indonesia, the prevalence of high cholesterol reached approximately 28% and is even increasingly found in younger age groups (Ministry of Health of the Republic of Indonesia, 2022). This indicates a shift in the epidemiology of metabolic diseases, which no longer only affect the elderly but also those of productive age, potentially increasing the burden of disease in the future.

Hypercholesterolemia has serious clinical implications for an individual's health. High cholesterol levels can lead to the formation of atherosclerotic plaques in blood vessels, leading to narrowing or blockage of blood flow (Safitri et al., 2023). This condition can trigger various complications, such

as coronary heart disease, stroke, and even sudden death. Furthermore, hypercholesterolemia also contributes to an increased economic burden due to high medical costs and reduced individual productivity.

Various efforts have been made to control cholesterol levels, both through pharmacological and non-pharmacological therapies. While medications such as statins have been shown to be effective in lowering cholesterol levels, they still have limitations, such as side effects and patient compliance issues (Egom & Lema, 2025). Therefore, non-pharmacological approaches such as lifestyle changes are an important alternative, particularly through increased physical activity and dietary adjustments. Physical activity and exercise have been shown to be effective strategies in the prevention and management of dyslipidemia through improved lipid metabolism and anti-inflammatory effects (Krüger et al., 2022).

However, the effectiveness of exercise interventions in lowering cholesterol levels varies depending on the type, intensity, and duration of exercise. Meta-analyses have shown that physical exercise can lower total cholesterol and increase HDL, although the effects are relatively moderate (Smart et al., 2025). This suggests the need for innovation in the form of more comprehensive interventions, focusing not only on physical aspects but also considering psychological factors that can influence the body's metabolic state.

In recent years, psychological factors such as emotional stress have begun to be recognized as important determinants in the development of cardiometabolic diseases. Stress can activate the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis, increasing cortisol production, which is associated with dyslipidemia and an increased risk of cardiovascular disease (Ortiz et al., 2022). Furthermore, recent research has shown that emotional factors and stress have a direct relationship to vascular function and heart disease risk, even when lipid levels are controlled (Egom & Lema, 2025).

Interestingly, physical activity not only provides physiological benefits but also plays a role in reducing stress and improving psychological well-being. Recent studies have shown that physical activity can reduce stress-related brain activity and significantly reduce the risk of cardiovascular disease (Tawakol, 2024). Furthermore, physical activity has also been shown to lower cortisol levels, an indicator of stress (De Nys et al., 2022). This indicates that the combination of physical activity and positive emotional states has the potential to have a synergistic effect on cardiovascular health.
However, today, most exercise interventions still focus solely on physical aspects and have not yet integrated psychological approaches such as happiness or positive emotions into a structured approach. Yet, a holistic approach that combines physical and mental aspects has the potential to deliver more optimal results in lowering cholesterol levels. This gap is a crucial basis for developing new, innovative interventions.

ANANDA exercise is an innovative intervention that combines physical activity with a positive emotional state (happiness). This concept is based on the principle that a positive psychological state can modulate the body's physiological responses, including lipid metabolism and stress hormone regulation. By integrating structured exercise movements and a happy atmosphere, ANANDA exercise is expected to provide a more optimal effect in lowering cholesterol levels compared to conventional exercise interventions. Based on this description, this study is crucial to analyze the effect of ANANDA exercise on lowering blood cholesterol levels. This research is expected to contribute scientifically to the development of innovative, effective, and holistic non-pharmacological interventions for the prevention and control of cardiovascular disease.

## METHOD

This research is quantitative research with an experimental analytical study design using the method *pre-posttest design.* This research was conducted by conducting observations. First (*pre-test*) after that an intervention was carried out and then a second observation (*post-test*). There are two types of variables in this study: independent variables and dependent variables. Ananda exercise is the independent variable, and blood cholesterol levels are the dependent variable. The data analysis used in this study is bivariate analysis using statistical tests. *Paired sample t-test.* This research was conducted in April 2026. The population in this study were mothers and elderly people with high blood cholesterol levels registered in Gemolong District, Sragen Regency with a population of 60 respondents. This study used total sampling with a sample size of 60 respondents.

## RESULT

Table 1.
Respondent characteristics

| Respondent Characteristics | f | % |
|---|---|---|
| Age | | |
| ≤ 53 years | 27 | 45 |
| > 53 years | 33 | 55 |
| Gender | | |
| Woman | 45 | 75 |
| Man | 15 | 25 |
| Level of education | | |
| ≤ Senior High School | 38 | 63.3 |
| > Senior High School | 22 | 36.7 |
| Employment Status | | |
| Doesn't work | 42 | 70 |
| Work | 18 | 30 |

Based on table 1, it can be explained that the 60 research respondents have characteristics where most of the respondents are aged > 53 years, namely 33 respondents (55%), the gender is mostly female, amounting to 45 respondents (75%), the education level of most is ≤ high school, namely 38 respondents (63.3%) and the employment status of most of them is not working, namely 42 respondents (70%).

Table 2.
Statistical test results*paired sample t-test*The effect of Ananda exercise on reducing cholesterol levels in the blood

| Variables | Mean | CI 95% | | t | p |
|---|---|---|---|---|---|
| | | Lower | Upper | | |
| Blood Cholesterol Levels Before ANANDA Exercise - Blood Cholesterol Levels After ANANDA Exercise | 13.535 | 10.374 | 16.693 | 8.570 | 0.000 |

Based on the results of the test analysis *paired samples t-test* as presented in Table 2, it was found that there was a significant difference between blood cholesterol levels before and after the ANANDA exercise program. The average difference in cholesterol levels was 13.535, indicating that cholesterol levels before the intervention were higher than after the intervention. The statistical test results showed a t-value of 8.570 with a significance level (p-value) of 0.000 ($p < 0.05$), thus the null hypothesis ($H_0$) was rejected. This indicates that the difference that occurred was statistically significant. In addition, the 95% confidence interval for the mean difference ranged from 10.374 to 16.693, which did not cross the zero value, thus further strengthening the existence of a meaningful difference between the two measurement conditions. Thus, it can be concluded that ANANDA exercise significantly reduces blood cholesterol levels. These findings suggest that structured physical activity interventions such as ANANDA exercise have the potential to be an effective non-pharmacological approach to cholesterol management.

## DISCUSSION

The results showed that ANANDA exercise significantly reduced blood cholesterol levels. The mean reduction in cholesterol levels was 13.535 mg/dL with a 95% CI of 10.374–16.693 and p=0.000, indicating that this intervention produced statistically significant changes. These findings indicate that structured exercise-based physical activity can be a relevant non-pharmacological strategy to help control cholesterol in the community, particularly in groups of mothers and the elderly with high cholesterol levels. The decrease in cholesterol after ANANDA exercise can be explained by increased metabolic activity during exercise. Physical exercise increases energy requirements, accelerates fatty acid oxidation, improves insulin sensitivity, and increases the use of lipids as an energy substrate. Research conducted by Yun et al. (2023) shows that various forms of exercise, particularly aerobic and combination exercise, can improve lipid profiles by reducing total cholesterol, LDL-C, and triglycerides, and increasing HDL-C in several adult populations. Lin (2021) explains that regular physical activity is directly related to a better lipid profile.

Beyond the physiological aspects, the uniqueness of ANANDA exercise lies in the integration of physical activity with positive emotional experiences. This approach is important because psychological stress is known to be associated with increased cardiometabolic risk through activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis (Elsadai et al., 2025). Chronic activation of stress pathways can increase cortisol, affect glucose and lipid metabolism, and contribute to dyslipidemia, hypertension, obesity, and cardiovascular disease (Ortiz et al., 2022).

The inclusion of elements of happiness, a pleasant atmosphere, and group activities in ANANDA Exercise has the potential to enhance the effects of exercise by reducing stress and improving psychological well-being. Recent literature suggests that positive psychological well-being, such as positive emotions, optimism, and life satisfaction, is associated with better cardiovascular health. Positive psychology-based interventions are also beginning to be seen as relevant in cardiovascular disease prevention because they can influence healthy behaviors, stress regulation, inflammation, and neuroendocrine function (Boehm, 2021). This is in line with research conducted by Li et al. (2024), which states that physical activities such as exercise, which are enjoyable and based on rhythmic movements, can provide both metabolic and psychological benefits, thus affecting a person's blood cholesterol levels.

The results of this study are also consistent with evidence in middle-aged and older populations. Research conducted by Yun et al. (2023) showed that aerobic exercise, resistance exercise, and combined aerobic-resistance exercise can lower total cholesterol, with aerobic exercise being one of the most effective modalities for improving lipids in older adults. Therefore, the cholesterol reduction in this study not only reflects changes in laboratory values but can also be understood as part of a broader improvement in cardiovascular risk.

ANANDA exercise also has unique value because it emphasizes not only physical activity but also integrates a positive emotional state. This approach is important because psychological stress is associated with cardiovascular risk through activation of the hypothalamic-pituitary-adrenal axis, increased stress hormones, vascular dysfunction, inflammation, and changes in health behaviors. Furthermore, chronic stress contributes to CVD risk through hemodynamic, vascular, immune, and neuroendocrine disorders (Vaccarino & Bremner, 2024). The happiness element of ANANDA exercise may enhance the intervention's benefits, as positive psychological well-being is associated with improved cardiovascular health. Zhong et al.'s (2024) study showed that higher well-being is associated with a lower risk of coronary heart disease, myocardial infarction, heart failure, and stroke; this relationship is partially mediated by healthy lifestyle behaviors and lower levels of inflammatory markers. Therefore, ANANDA exercise has the potential to work through two pathways simultaneously: the metabolic pathway mediated by physical activity and the psych neuroendocrine pathway mediated by increased positive emotions. This finding aligns with Hernáez et al.'s (2021)

study, which demonstrated that physical activity performed comfortably and enjoyably has a significant physiological impact on cholesterol metabolism. The results of this study are also supported by literature showing that stress hormones are linked to the risk of cardiovascular disease. Research by Tsai et al. (2024) showed that higher levels of stress hormones, including cortisol and catecholamines, are associated with an increased risk of CVD. Therefore, interventions that reduce stress and improve mood have the potential to provide additional benefits for lipid metabolism and vascular health.

Based on the characteristics of the respondents, the majority were women and most were unemployed. In this group, community-based interventions such as group exercise have the potential to increase adherence because they are social, enjoyable, easily accessible, and do not require special equipment. Group activities can also increase motivation, social support, and the sustainability of healthy behaviors. In the context of community nursing, ANANDA exercise can be a promotive-preventive approach that is easily implemented in elderly health posts (posyandu), community health centers (Puskesmas), PKK groups, and community groups. Furthermore, support through good health literacy can increase readiness to manage a better lifestyle (Kurniawan et al., 2026). These findings support the modern cardiovascular prevention paradigm, which focuses not only on pharmacological therapy but also on lifestyle interventions. Current guidelines and literature emphasize that physical activity, a healthy diet, weight management, adequate sleep, and stress management are essential components in managing dyslipidemia and preventing cardiovascular disease.

## CONCLUSION

ANANDA exercise has been proven to have a significant effect on reducing blood cholesterol levels in mothers and elderly with hypercholesterolemia in Gemolong District, Sragen Regency. The results of the study showed a decrease in average cholesterol levels of 13.535 mg/dL after the intervention, with the results of the paired sample t-test showing a p value of 0.000 ($p<0.05$). These findings indicate that ANANDA exercise is effective as a non-pharmacological intervention in helping control cholesterol levels. The structured physical activity in ANANDA Exercise can improve lipid metabolism, improve energy expenditure, and support cardiovascular health. Furthermore, the integration of elements of happiness, a pleasant atmosphere, and group activities in ANANDA Exercise has the potential to reduce psychological stress and improve emotional well-being, which indirectly influence lipid metabolism and cardiovascular risk. Therefore, ANANDA Exercise can be considered an innovative, easy-to-implement, affordable, and holistic community-based promotive and preventive approach to the prevention and control of hypercholesterolemia.

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