

The Role Of Aerobic Workouts In Altering Cholesterol Levels In Over Weight Undergraduates

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Abstract

The purpose of the present study was to assess the role of aerobic workouts in altering cholesterol levels in over weight undergraduates. Forty over weight (BMI \pm 28) women students ($n = 40$) were randomly selected as subjects and their age ranged between 18 and 22 years. The selected subjects were randomly assigned into two equal groups such as the experimental group (EG) and control group (CG) with twenty subjects each ($n = 20$). The experimental groups underwent their respective experimental treatment for five days in a week for twelve weeks and a session on each day. The control group was not exposed to any specific workouts apart from their day to day activities. The total cholesterol was taken as variable for this study. Analysis of covariance (ANCOVA) was used to analyze the collected data. The results revealed that the experimental group (EG) produced significant improvement ($p \leq 0.05$) on total cholesterol level due to twelve weeks of aerobic workouts when compared to control group (CG).

Keywords: Aerobic training, lipoprotein, total cholesterol, over weight, undergraduates.

Introduction

Cardio training is bodily pastime that involves rhythmic and repetitive movement of huge muscle organizations, like on foot, walking, or biking, to raise your coronary heart price and breathing for a sustained duration. additionally called cardio, it strengthens the heart and lungs, improves stream, and boosts the frame's performance at using oxygen for sustained energy production (<https://www.google.com>). it's far a form of physical activities with stretching and energy training routines with the aim of improving all elements of health in particular cardiovascular fitness. It's far a light to mild depth, and may be undertaken for a prolonged duration (many minutes to numerous hours) with out immoderate fatigue (Blair & Morris, 2009). It strengthens the coronary heart and lungs and trains cardiovascular system to manage and supply oxygen more speedy and correctly at some point of the frame.

Aerobic exercise uses the large muscle groups, is rhythmic in nature, and can be maintained continuously for at least 10 minutes (www). Regular exercise causes the body to make adjustments that result in improved health and physical functioning (Johnson *et al*, 1982) Regularly doing the right

types of exercise at the correct intensity, and for an appropriate duration, results in the most benefit (ACSM, 2000). Other fitness improvements occur in the exercising muscles, and are specific to those muscles being used in the mode of exercise (e.g. walking, running, cycling, or swimming). These include an increased capacity for the muscles to take up and use the additional oxygen being delivered by the heart. Regular aerobic exercise has been shown to reduce the risk of total cholesterol (Barengo *et al.*, 2006). It can also reduce anxiety, stress and depression, as well as instilling a general sense of well-being.

Over weight is a continual, relapsing, revolutionary disorder characterised by way of persistent systemic irritation and metabolic inflexibility (Goodpaster & Sparks, 2017). obese or weight problems repute will increase the danger of CVDs (Van Gaal *et al.*, 2006), while dyslipidemia is an critical hyperlink between weight problems and the improvement of CVDs (Zeljko *et al.*, 2024). weight problems can lead to dyslipidemia, which include accelerated total ldl cholesterol and reduced excessive-density lipoprotein (HDL) after which elevates the hazard of CVDs (Vekic *et al.*, 2019). consequently, weight problems is one of the major modifiable risk elements for non-communicable diseases. current research emphasize the importance of management and prevention to mitigate disease threat among patients with obesity (Phelps *et al.*, 2024). for this reason, well timed improvement and prevention measures are specifically essential for people with over weight.

Total cholesterol is the sum of all the cholesterol in the blood. It is used to produce hormones and cell membranes and is transported in the [blood plasma](#) of all [mammals](#) (Emma, 2009). It is a waxy [steroid](#) of fat that is produced in the liver or intestines. In addition, cholesterol is an important component in the [manufacture](#) of [bile acids](#), [steroid hormones](#), and [vitamin D](#). Cholesterol is an important and necessary for mammals, high levels of cholesterol in the blood can damage arteries and are potentially linked to diseases such as those associated with the cardiovascular system (Pearson *et al.*, 2003). The liver is the major production factory for cholesterol (about 70%). High cholesterol levels are strong indicators of those individuals that are prone to coronary heart disease (Olsin, 1990).

Elevated total cholesterol is a risk factor for coronary heart disease. The build-up of plaque in the artery may lead to narrowing (high blood pressure) or complete blockage (heart attack) of the vessel (Tymoczko, 2002). As levels rise above 180 mg/dl, the risk for developing coronary heart disease increases (American heart association, 2008). A reduction of 1% is shown to reduce the risk of coronary artery disease by 2% for levels over 200 mg/dl (Gordon *et al.*, 1995). The aerobics helps to reduce the level total cholesterol (Pearson *et al.*, 2003). The present study was to assess the role of aerobic workouts in changing the cholesterol levels in over weight women undergraduates.

Materials and Methods

Forty women over weight (BMI \pm 28) under graduate ($n = 40$) were selected from the colleges of Ernakulam city, Kerala during the academic year 2024-25 and the age of the students were between 18 and 22 years. The selected subjects were randomly divided into two equal groups of twenty subjects each ($n = 20$). The groups were one experimental group (EG) and one control (CG). During the training period, the experimental groups underwent their respective training programme for 5 days

in a week for twelve weeks and a session on each day apart from their regular programme. Control group (CG), who did not participate in any specific training apart from their day to day activities. Moderate intensity (60-70%) of aerobic workouts were used in this experiment. The cholesterol level was selected as the criterion variable for this study. It was measured by oxides enzymatic method using the Boehringer Mannheim kit and it was measured in milligram per deciliter (mg/dL). The BMI of the students were between 26 and 29. BMI is a measurement of a person's leanness or corpulence based on their height and weight and is intended to quantify tissue mass. The formula of calculating BMI is kg/m^2 .

These are the exercise used as an aerobic 1. Brisk walking 2. Jogging 3. Callisthenics 4. Skipping 5. Step climbing 6. Stretching 7. Abdominal crunches. Mean and standard deviation were calculated for total cholesterol for each training group. The training was successful and no student was discontinued the training, however some students were skipped some session because of the personal problems. The data were analyzed by using analysis of covariance (ANCOVA). Statistical significance was fixed at 0.01 and 0.05 levels.

Results

Table - I

Analysis of Covariance on Total Cholesterol of Experimental Group and the Control Group

Test		Exp. Group	Control Group	SOV	SS	df	MS	F
Pretest	Mean	212.34	207.62		123.56	1	133.98	
	SD	10.45	10.82	B W	5982.6	38	179.35	1.34
Post test	Mean	196.35	205.69		2490.32	1	2682.87	
	SD	10.26	11.78	B W	4792.14	38	121.47	8.28*
Adjusted Post test	Mean	195.78	205.88		2834.23	1	2633.98	
				B W	4322.87	37	112.94	9.41*

$F = (df 1, 38) (0.05) = 4.10$ & $(0.01) = 7.35$; $(P \leq 0.05)$ & $(P \leq 0.01)$, $F = (df 1, 37) (0.05) = 4.11$ & $(0.01) = 7.37$; $(P \leq 0.05)$ & $(P \leq 0.01)$.

Table I shows that the pre test mean values of experimental and control groups are 212.34 and 207.62 respectively. The obtained F value of 1.34 for the pre test mean is less than the table value 4.10 for df 1 and 38 required for significance at 0.05 level and table value 7.35 for df 1 and 38 required for significant at 0.01 level. The post tests mean of experimental and control groups are 196.35 and 205.69 respectively. The obtained F value of 8.28 for post test mean is higher than the table value 4.10 for df 1 and 38 required for significance at 0.05 and table value 7.35 for df 1 and 38 required for significant at 0.01 level. The adjusted post test mean of experimental and control

groups are 195.78 and 205.88 respectively. The obtained F value of 9.41 for adjusted post test mean is also higher than the required table value 4.11 for df 1 and 37 required for significant at 0.05 and 7.37 to 0.01 levels.

The result of the study indicated that there were significant differences between the post test and adjusted post tests mean of the aerobic training group and the control group on cholesterol level at 0.05 and 0.01 levels. The pre, post and adjusted post test mean values are graphically presented in the figures 1 & 2.

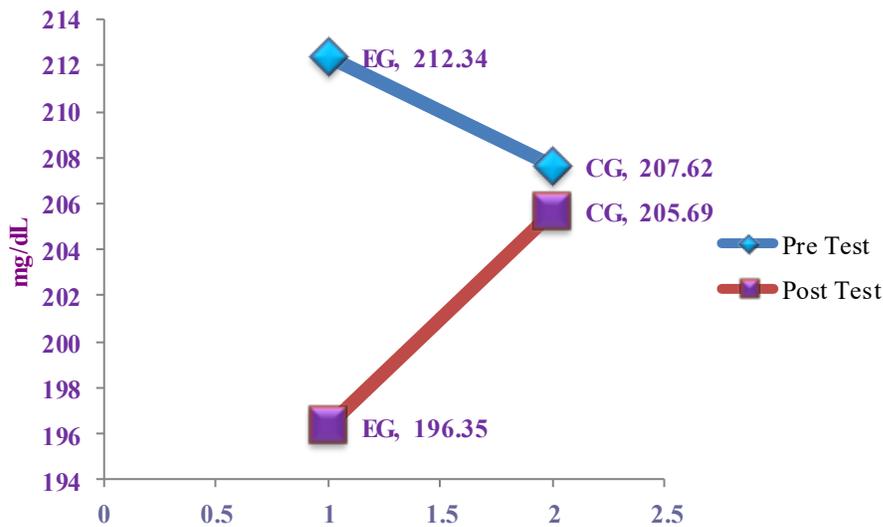


Figure 1: The pre and post test mean values of experimental group and control group on Total Cholesterol

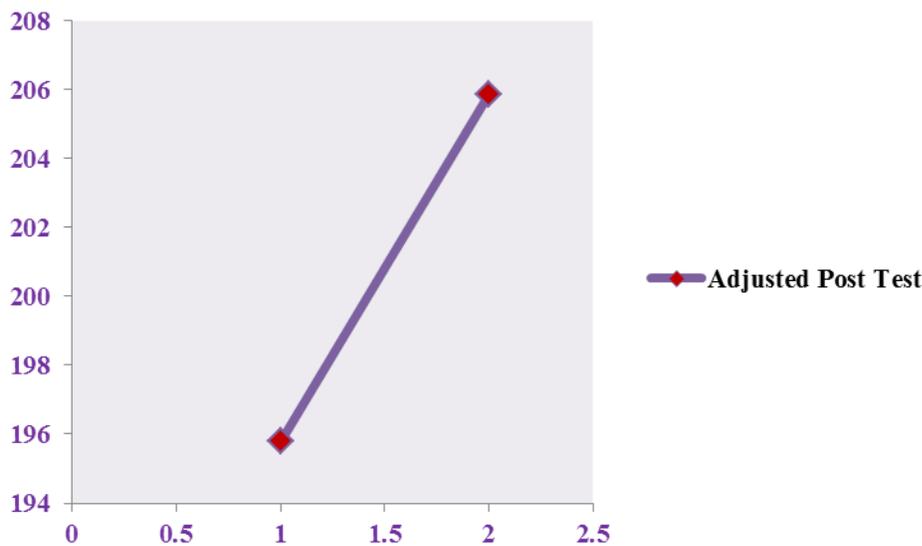


Figure 2: The adjusted post test mean values of experimental group and control group on Total Cholesterol

Cholesterol

Discussion

The results of the study revealed that there was a significant improvement on total cholesterol due to twelve weeks of aerobic workouts in undergraduate over weight women students. Several investigators have reported favorable changes in blood lipids and lipoproteins following a physical training (Braith & Stewart, 2006). Boardley (2007) clearly explained that the systematic aerobics helps to normalize the cholesterol level. From the results of the present study and literature, it is concluded that the total cholesterol was significantly reduced due to twelve weeks of aerobic training. Physical fitness can help to normalise the blood cholesterol level (Pescatello *et al.*, 2000). The association between high serum cholesterol levels and the incidence and severity of coronary heart disease (CHD) is so pronounced in epidemiological studies that the National Heart, Lung, and Blood Institute recognize this association as causal (Expert Panel, 1993). Joseph *et al* (2024) found out through their study that the physical exercise can improve the good cholesterol among type 2 diabetic patients. The study result of Mathew *et al* (2025) is in accordance with the results of this study. They were proved that the systematic home based physical activity can reduce the LDL cholesterol.

Epidemiological research has decisively demonstrated that low concentrations of total cholesterol and low-density lipoprotein cholesterol (LDL-C), and high levels of high-density lipoprotein cholesterol (HDL-C) are associated with a decrease in coronary heart disease (Kannel, 1983). For young adults, the LDL-lowering effect is better than in other age groups. This has been supported in other studies. Mohammadi *et al.* (2014) found significant differences in the effects of 8-week aerobic training on cardiometabolic health parameters in young men with obesity, with LDL decreasing. A recent meta-analysis comparing moderate-intensity and vigorous-intensity AE for lipid improvement in adolescents with obesity has also demonstrated that vigorous-intensity AE led to a significant reduction in LDL and TC levels (Mamikunian, 2023). The aerobic work outs is one of the best exercise to improve the physical activity and maintain the basic fitness to survive (Kumar *et al.*, 2024). As health and fitness practitioners, designing exercise programs that alter the individual's total cholesterol in a positive way is an important component to be included in program objectives.

Conclusion

This study is concluded that there was a significant improvement in total cholesterol level due to twelve weeks of aerobic workouts during the age between 18 and 22 years of women undergraduate students. This study also revealed that the level of cholesterol is in the boaderline of the majority of women students, who belong to 18-22 age group, which was surprising. So there is some types of regular physical activity is very essential to manage or normalize the cholesterol level of the undergraduate women students especially over weight students.

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