

Effects of Aerobic Training and Yogic Practices on High-Density Lipoprotein Cholesterol Levels in Obese College Men

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Abstract–The aim of this research was to investigate the impact of aerobic training and yogic practices on high-density lipoprotein (HDL) cholesterol levels among obese college men. To achieve this objective, 45 obese college men aged between 18 to 22 years were randomly selected as participants from various colleges in Anantapuramu town. HDL cholesterol served as the dependent variable for the study. The participants were divided into three groups: Experimental Group I underwent aerobic training (ATG), Group II underwent yogic practices (YPG), and Group III served as the control group (CG). Each group consisted of fifteen subjects (n=15). The intervention period lasted for 12 weeks. Data on the selected dependent variable were collected two days before and after the training program as pre-tests and post-tests, respectively. High-density lipoprotein (HDL) cholesterol levels were assessed using the enzymatic calorimetric method with blood samples obtained from each subject. Fasting blood samples were taken in the morning, and the assessment was conducted at the Care Diagnostic Centre in Anantapuramu, India. Statistical analysis, specifically analysis of covariance (ANCOVA), was employed to examine the data collected from the three groups before and after the experimental period for significant improvement. In cases where the F ratio was significant, Scheffe's test was used as a post hoc test to identify significant differences among paired means. The criterion for statistical significance was set at a 0.05 level of confidence ($P < 0.05$). The results revealed that systematically designed aerobic training and yogic practice programs led to a significant increase in high-density lipoprotein (HDL) cholesterol levels among obese college men.

Keywords: HEALTH, AEROBIC TRAINING, YOGIC PRACTICES, HIGH DENSITY LIPOPROTEIN.

1. INTRODUCTION

Embracing an active lifestyle and engaging in physical activity is the pathway to achieving optimal health fitness. Consequently, exercise scientists worldwide are undertaking various research programs aimed at addressing issues related to health-related fitness. The growing dependence on technology has considerably reduced physical activity associated with work and daily tasks such as house cleaning, laundry, dishwashing, lawn mowing, and commuting. This shift has resulted in more available time for leisure activities. Unfortunately, a significant number of individuals do not utilize this leisure time for physical exercise, despite the human body being inherently designed for movement and rigorous activity. Health and fitness professionals emphasize that regular physical activity serves as a crucial defense against the onset of numerous diseases and disorders, contributing to overall well-being and longevity. The primary goal of physical exercise programs is to establish and sustain cardiorespiratory fitness. Aerobic training, a progressive conditioning program, stimulates cardiovascular activity through exercises like running and skipping. Unsupervised sessions may include stretching, short sprints, and relaxation exercises. Yoga, derived from the Sanskrit word 'Yuj' meaning 'to unite' or 'to join,' extends beyond a series of twisted body poses. Its core purpose is to facilitate a connection with one's inner spirit, linking it to the universal spirit or God. Yoga aims to harmonize the body and mind, fostering self-enlightenment. Highlighting the importance of high-density lipoprotein (HDL) cholesterol, known as "good" cholesterol for its role in reducing coronary heart disease risk, the study emphasizes that HDL should constitute at least 25 percent of total cholesterol. HDL functions by transporting cholesterol from cells back to the liver for excretion. The main objective of this study is to raise awareness of physical activity, particularly aerobic training and yogic practices, and their significant impact on health, physical fitness, and work capacity. As part of this effort, the investigator aims to explore the influence of aerobic training and yogic practices on high-density lipoprotein (HDL) in obese college men.

II. METHODOLOGY

The objective of the current study was to assess the impact of aerobic training and yogic practices on high-density lipoprotein (HDL) cholesterol levels among obese college men. A total of 45 obese college men, aged 18 to 22 years as per college records, were randomly selected as participants. These individuals were then divided into two experimental groups and a control group, each consisting of fifteen subjects (n=15). Experimental Group I underwent aerobic training (ATG), Group II engaged in yogic practices (YPG), while Group III served as the control group (CG) throughout the 12-week training period. To evaluate the effectiveness of the interventions, data collected from the three groups before and after the experimental period underwent statistical analysis using analysis of covariance (ANCOVA). Whenever the 'F' ratio was found to be significant, post-hoc tests, specifically Scheffe's test, were applied to determine significant differences among paired means. The criterion for statistical significance was set at a 0.05 level of confidence (P<0.05). The analysis of covariance focused on the data related to high-density lipoprotein (HDL) cholesterol levels, considering pre-test, post-test, and adjusted post-test values for the aerobic training (ATG), yogic practices (YPG), and control (CG) groups, as presented in Table I.

Table I: Analysis of Covariance for Pre-Test, Post-Test, and Adjusted Post-Test Data on High-Density Lipoprotein (HDL) of Aerobic Training, Yogic Practices, and Control Groups.

Tests / Groups		ATG	YPG	CG	SOV	Sum of Squares	df	Mean Squares	F ratio
Pre Test	\bar{X}	37.07	35.76	36.19	B	13.23	2	6.61	2
	σ	1.94	1.66	1.84	W	138.79	42	3.30	
Post Test	\bar{X}	38.6	36.85	35.73	B	62.59	2	31.29	11.38*
	σ	1.75	1.69	1.53	W	115.54	42	2.75	
Adjusted Post Test	\bar{X}	37.98	37.35	35.86	B	34.64	2	17.32	55.18*
					W	12.87	41	0.314	

* F(0.05) (2, 42 and 2, 41) = 3.22, *Significant at 0.05 level of confidence

Sov: Source of variance, B : Between, W : Within

The statistical analysis in the above table reveals that the pre-test means of high-density lipoprotein (HDL) for the aerobic training, yogic practices, and control groups are 37.07, 35.76, and 36.19, respectively, resulting in an F ratio of 2. This F ratio suggests no statistically significant difference between the pre-test means at a 0.05 level of confidence. In contrast, the post-test means of HDL for the aerobic training, yogic practices, and control groups are 38.6, 36.85, and 35.73, respectively, yielding an F ratio of 11.38. This indicates a statistically significant difference between the post-test means at a 0.05 level of confidence. Furthermore, the adjusted post-test means of HDL for the aerobic training, yogic practices, and control groups are 37.98, 37.35, and 35.86, respectively. The obtained F-ratio value of 55.18 exceeds the table value of 3.22 with degrees of freedom 2 and 41 required for significance at the 0.05 level. This result indicates a significant difference among the adjusted post-test means of HDL for the aerobic training, yogic practices, and control groups.

Table II : Scheffe's post hoc test for differences of the adjusted post test paired means of High Density Lipoprotein cholesterol

Adjusted Post Test Means			Mean Differences	Confidence Interval
ATG	YPG	CG		
37.98	37.35	--	0.63*	0.52
37.98	--	35.86	2.12*	
--	37.35	35.86	1.49*	

* Significant at 0.05 level

The data presented in the above table illustrates statistically significant differences in the adjusted post-test mean values of high-density lipoprotein (HDL) between the Aerobic Training group and Yogic Practices group, Aerobic Training group and Control group, and between Yogic Practices

group and Control group, with mean differences of 0.63, 2.12, and 1.49, respectively. These differences were found to be statistically significant at the 0.05 level of confidence. In conclusion, it is evident that there is a noteworthy disparity in HDL levels among the groups. Notably, the Aerobic Training group demonstrated superior effectiveness in increasing HDL levels in the blood compared to both the Yogic Practices group and the Control group.

To visually depict the pre-test, post-test, and adjusted post-test mean values of the Aerobic Training group, Yogic Practices group, and Control group for high-density lipoprotein (HDL), Figure I provides a graphical representation.

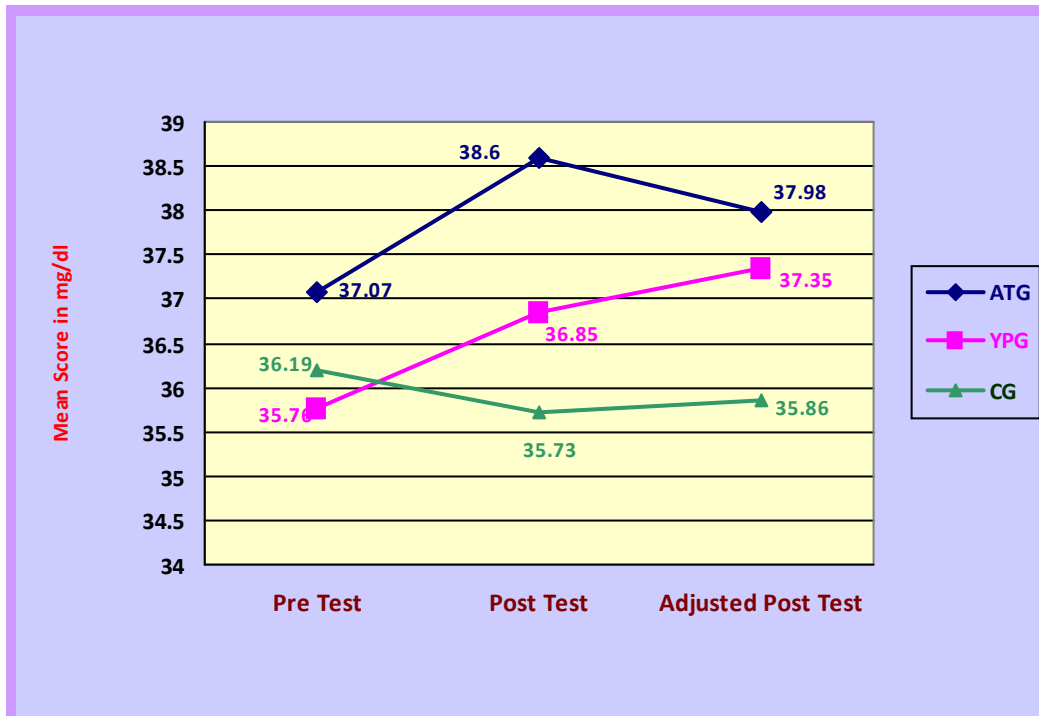


Figure I: Line Graph depicting Pre-Test, Post-Test, and Adjusted Post-Test Mean Values of High-Density Lipoprotein (HDL) for the Aerobic Training Group, Yogic Practices Group, and Control Group.

III. CONCLUSION

In the current study, two training programs—namely, aerobic training and yogic practices—yielded notable improvements in the high-density lipoprotein (HDL) levels among obese college men.

- The levels of high-density lipoprotein (HDL) cholesterol experienced a significant increase as a result of the influence of both aerobic training and yogic practices, in comparison to both the control group and the pre-test measurements.
- The systematic and well-planned aerobic training and yoga practice programs were found to be significantly effective in enhancing high-density lipoprotein (HDL) cholesterol levels.

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