

EFFECTS OF AEROBIC EXERCISE PROTOCOL ON HIGH DENSITY LIPOPROTEIN HDL LEVEL AMONG YOUNG ADULTS; AN EXPERIMENTAL STUDYHaseenullah Khan¹, Salahuddin Khan², Tasleem Arif³, Inayat Shah^{4*}**ABSTRACT**

Purpose: Exercise has paramount significant in the life of individuals. But unfortunately, very few studies have been conducted in Pakistan regarding the effects of exercise upon HDL level. Therefore, the present study was subjected to evaluate the effects of six (06) weeks supervised aerobic exercise protocol on High Density Lipoprotein among young adults aged between 35-40 years. Materials: Twenty-Four (24) volunteer untrained young adults from within the Bannu City and allied areas were selected as subjects' age range between 35-40 years. Keeping into consideration, the present study was supported with pre and post experimental research method. The six (06) weeks aerobic exercise protocol was used to collect relevant data on the selected dependent variable. The High Density Lipoprotein (HDL) of the subjects were measured with the help of CHOD PAP method. The results were then recorded in figures. The pre and post test data on the selected criterion variables were collected by administering the test as per the standardized procedures before and after the six weeks of the training program. Results: After the aerobic exercise protocol, the subjects of CG exhibited no significant difference in HDL ($P > 0.05$). According to the analyzed data, the P -value was recorded as .709 that is higher than the standard value of 0.05. Upon these data, the researcher found that after the aerobic exercise protocol, no significant difference between exhibited between pre- and post-intervention quantities of HDL of Experimental Group ($P > 0.05$). Conclusions: Based on the analyzed data, it can be interpreted that aerobic exercise helped in increasing HDL of Experimental Group. The increase in HLD is considered as good because the increase in HDL helps in preventing the heart valves from stroke and heart attack.

Key Words: effects, aerobic exercise, HDL level, young adults, experimental study.

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INTRODUCTION

The chronic heart diseases (CHD) are estimated the major cause for death throughout the world. According to the World Health Organization (WHO, 2006) the ratio of chronic heart diseases would raise from 7.1 to 11.1 million. According to American Heart Association, the chronic heart disease is reported to global cause for mortality rate of 17.3 million per year (Mozaffarian et al., 2015). As far as Pakistan is concerned, it has been estimated that chronic heart diseases are accounted for 92% of all the death (Akhtar et al., 2012).

As reported that the population in India and Pakistan have been suffering from Coronary Heart Diseases and estimated highest risk countries in the world with reference to the Coronary Heart Diseases (Akhtar et al., 2012). In another study has found that Younger patients <40 years of age with an acute coronary syndrome have different clinical characteristics and a different prognosis than older (Siddique et al., 2010). Further the study has also found that smoking is perceived as the risk factors for Acute Coronary Syndrome (ACS) among people aging <40 (Yildirim., 2007). Findings of the study suggested that identification of the risk factors in respect to heart diseases and control is beneficial in the initial and secondary prevention in young patients with coronary artery diseases. The study has further substantiated that patients with premature CHD commonly have unheralded acute onset of symptoms, less extensive CHD and better short-term prognosis than the older ones (Hecht, 2010).

The causes and prevention of coronary heart diseases is a topic of research, and fresh statistics is always developing. It has been asserted for last several decades that saturated fats as well as cholesterol are responsible factors for cardio-vascular heart diseases (Vallurupalli, & Mehta, 2014). A study conducted by DeBakey (2012) found that 1% increase in blood cholesterol level can cause 2% risk of heart disease (Yang et al., 2012; Hoogeveen, 2014). Conversely, latest research showed that a higher intake of saturated fat from red meat increases risk of heart disease (Micha et al., 2013). According to National Heart, Lung, and Blood Institute (Grundey et al., 2004) Hypertension is considered as major risk factor for several complications including stroke and heart failure. Likewise, US Centers for Disease Control and Prevention (Inzucchi and Sherwin, 2011) reported that Diabetes mellitus (DM) has major confounding effects on the cardio-vascular functions. Cigarette smoking is reported as one of the leading cause responsible for the cardio-vascular heart diseases and heart attacks (Leone, 2005).

On the other hand, regular take part in exercises are effective in prevention of heart diseases (Pedersen, & Saltin, 2015) Various research studies have found that regular moderate-intensity exercise has many benefits like physical function (fitness), psychological wellbeing, favourable changes in blood pressure and HDL cholesterol level), it prevents the blood vessels from narrowing which is caused by increased cholesterol level, prevents blood clotting, helps deliver oxygenated blood to the heart, and helps to maintain a normal heart rate (Taylor et al., 2004; Warburton et al., 2006; Frye et al., 2007) . The study has further found that the above mentioned changes

reduce the load on the heart at rest and during exercise, which helps to minimize as well as decrease the risk of death from Coronary Heart Diseases. Moreover, the findings of the studies reveal that exercise improves physical fitness and psychological functions, and positive changes in blood pressure, helps in increasing HDL cholesterol level (Stroth et al., 2010; Dickinson et al., 2006; Tseng et al., 2013).

Keeping in view the above brief discussions, it becomes quite apparent that exercise has paramount significant in the life of individuals. But unfortunately, very few studies have been conducted in Pakistan regarding the effects of exercise upon cholesterol level. More local data is needed for primary as well as secondary prevention of coronary heart disease in young patients of coronary artery disease. Therefore, the researchers conducted an experimental study to evaluate the effects of aerobic exercise upon HDL level of young adults. This study was conducted in the vicinity of bannu district.

Objectives: 1. To assess the comparison of Pre and Post-test results regarding HDL of Control Group. 2. To evaluate the comparison of Pre and Post-test results regarding HDL of Experimental Group

Hypotheses: Ho 1 There is no significant difference between the pre- and post-intervention measurements of HDL of Control Group (CG). Ho 2 There is no significant difference between the pre- and post-intervention measurements of HDL of Experimental Group (EG).

MATERIALS AND METHODS

Participants: The study aimed at to examine the effects of aerobic exercise protocol upon HDL level of young adults aging 35-40 years. For this purpose, Twenty-Four (24) volunteer untrained young adults from within the Bannu City and allied areas were selected as subjects.

Research Design: The study involved a single dimensional design with two groups assign with different training batteries. To facilitate the study, Twenty-Four (24) untrained young adults from within the bannu city and allied areas were selected as subjects aging between 35-45 years. The subjects were divided into two equal groups namely, (group A) Experimental Group (EG) and Group B (Control Group). The pre-test was taken from the subjects before administering the aerobic exercise protocol. The subjects of experimental group were involved with their respective packages of aerobic exercise protocol for a period of six (06) weeks under the personal supervision of the research scholar, whereas the subjects of control group were given no treatment. At the end of six (06) weeks, the post – test was applied from the experimental group.

Research Instrument/Treatment Protocol: The present study was conducted in order to assess effects of aerobic exercise protocol upon cholesterol level of young adults aging 35-40 years. As per the available literatures and the consents of training experts, the proposed six (06) weeks aerobic exercise protocol was used to collect relevant data on the selected dependent variable.

Criterion Measure: The High Density Lipoprotein (HDL) of the subjects were measured with the help of CHOD PAP method. The Blood samples were taken from the participants in disposable Syringes by qualified dispenser. The samples were taken in test tubes. Blood samples were centrifuged in centrifuge machine up to 10 minutes' maximum to take serum. Serum of the subjects were taken in test tubes of one ml, and then incubate it on 37°C. The absorbance of the participants was measured within 60 minutes against the reagent blank.

Data Collection Procedure: The researcher obtained formal approval from the departmental supervisory committee for conducting the experimental intervention upon the selected volunteers. The researcher then started aerobic exercise program under his personal supervision that continued for 6 weeks. The pre and post test data on the selected criterion variables were collected by administering the test as per the standardized procedures before and after the six weeks of the training program.

Statistical Analysis: The collected data was carefully tabulated and analyzed by using statistical tests i-e Independent sample t-Test and Paired Sample t-Test in SPSS version 24.00. We used Independent sample t-Test to compare the anthropometric measurements of two different groups such as Control Group (CG) and Experimental Group (EG) to determine the whether there is statistical evidence that the means of two groups are significantly different in terms of height, weight and BMI. To determine the comparison of Pre and Post-test results regarding the lipid profile of CG and EG respectively, we applied Paired Sample t-Test.

RESULTS

Anthropometric Parameters:

Table no. 1 Pre-intervention anthropometric parameters in young adults of the control and experimental groups (n=24)

Parameters	(CG) Mean \pm SD	(EG) Mean \pm SD	P-Value
Age	34.56 \pm 1.98	33.86 \pm 1.59	0.132
Height (Inches)	62.75 \pm 1.74	65.72 \pm 2.54	0.556
Weight (kg)	76.34 \pm 4.78	75.03 \pm 6.37	0.503
Body Mass Index (kg/m) ²	29.76 \pm 2.46	29.84 \pm 2.38	0.512

Significant at 0.05

According to the analyzed data, the mean age, height and weight of the control group were measured 34.56 \pm 1.98, 62.75 \pm 1.74 and 76.34 \pm 4.78 respectively. Likewise, the data shows 33.86 \pm 1.59, 65.72 \pm 2.54 and 75.03 \pm 6.37 respectively for age, height and weight of the experimental group. Similarly, the body mass index of both the control

and experimental groups were recorded in (kg/m)² for which the mean values were recorded as 29.76 ± 2.46 and 29.84 ± 2.38 . t-test was applied to examine the differences anthropometric parameters in young adults in the experimental and control groups and the results showed that there was no statistical significant difference in the Pre-intervention anthropometric parameters in young adults in the experimental and control groups.

Effects of Aerobic Exercises on High-density Lipoprotein (HDL)

Table 2: Comparison of Pre and Post-test results regarding HDL of Control Group (n=12)

Control Group	n	Mean	Std. Dev	t-Value	P-Value
Pre-test	12	46.833	6.307	.049	.962
Post-test	12	46.750	4.474		

Significant at 0.05

The Table 2 shows the pre- and post-intervention measurements of HDL of Control Group. After the aerobic exercise protocol, the subjects of CG exhibited no significant difference in HDL ($P > 0.05$).

Table 3: Comparison of Pre and Post-test results regarding HDL of Experimental Group (n=12)

Control Group	n	Mean	Std. Dev	t-Value	P-Value
Pre-test	12	47.583	6.612	-.395	.709
Post-test	12	48.416	6.006		

Significant at 0.05

The Table 3 shows the pre- and post-intervention quantities of HDL of Experimental Group. According to the analyzed data, the P-value was recorded as .709 that is higher than the standard value of 0.05. Upon these data, the researcher found that after the aerobic exercise protocol, no significant difference between exhibited between pre- and post-intervention quantities of HDL of Experimental Group ($P > 0.05$).

DISCUSSION

The study at hand was conducted to evaluate the effect of 6 weeks' aerobic exercise protocol upon HDL level of young adults aged between 35-40 years, Bannu, Khyber Pakhtunkhwa, Pakistan. After the aerobic exercise protocol, the subjects of CG exhibited no significant difference in HDL ($P > 0.05$). The hypothesis concentrated the effects of aerobic exercise protocol on high-density lipoprotein (HDLP) and the analyzed data affirmed that after the aerobic exercise protocol, no significant difference

exhibited between pre- and post-intervention quantities of HDL of Experimental Group ($P>0.05$). Thus, it can be concluded that aerobic exercise helped in increasing HDL of Experimental Group. Other studies have shown that although exercise may not produce any quantitative results in reducing the total cholesterol and low-density lipoprotein (LDL) level but, it can help in bringing change in LDL subtraction, increase in concentrating large LDL and reduction in small LDL (Tseng et al., 2013). The increase in HLD is considered as good because the increase in HDL helps in preventing the heart valves from stroke and heart attack. These findings are consistent with the statement that HDL is considered as one of the major mediators that, helps in the reverse transportation of cholesterol from arterial walls to the live. These findings affirm the hypothetical assumption that, increase in HDL level contributes to the reduction of cardiovascular risks (Chun et al, 2002).

CONCLUSION

Based on the results of the present study, the researcher concluded that aerobic exercise has positive effects upon HDL of young adults' aging 35-45 years. According to the analyzed data, young adults those who participated in an aerobic exercise program that continued for six weeks showed increase in the high-density lipoprotein (HDL) of the participants. The increase in HLD is considered as good because the increase in HDL helps in preventing the heart valves from stroke and heart attack. These results recommend a probable for lessening the risks of cardiovascular diseases among the adults.

PRACTICAL IMPLICATIONS

The aerobic exercise programs used in this study may help the adults to improve and maintain their lipid profile and can help in the reduction of chronic heart diseases (CHDs). The researcher also suggest that Aerobic exercise program used in the study may be prescribed by health care, sports coaches and physical educationists.

CONFLICT OF INTEREST

The authors have declared no conflict of interest

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