# INFLUENCE OF STEP AEROBICS AND OWNBODY RESISTANCE TRAINING ON HDL-c AMONG COLLEGE ATHLETES

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***Abstract***

The purpose of this study is to investigate the lipid profile alterations that take place during the step aerobics exercise and own body resistance training among male college athletes. Forty-five college male athletes were randomlyselected assubjects and their age ranged between 18-25 years. They were randomly divided into three equal groups such as experimental group (*EG* I &II) and control group (*CG*)with fifteen subjects (*n*=15). The experimental group underwent Step aerobics and own body resistance training for eight weeks three days per week and a session on each day.In which the group I underwent step aerobic exercises (*SAT*) and group two underwent own body resistance training (*ORT*) for three days per week for eight weeks and group III Control group (CG) which did not undergo any specific training apart from theirregular activities. HDLcholesterol selected as a test variable and assessed before and after the training period. The collected data was statistically analysed by using analysis of covariance (*ANCOVA*) and Scheffe's test was applied as apost hoc test to determine the paired mean difference. From the results of the study, it is found that t there was a significant improvement ($p \leq 0.05$) in HDL cholesterol level of training groups when compared to control group.

*Keywords*:Stepaerobics, ownbody resistance training, HDL Cholesterol.

## Introduction

The term 'lipid profile' describes the varying levels of lipids in the blood, the most commonly reported ones being low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol and triglycerides. High levels of LDL cholesterol indicate surplus lipids in the blood, which in turn increase the risk of cardiovascular complications. HDL cholesterol transports lipids back to the liver for recycling and disposal; consequently, high levels of HDL cholesterol are an indicator of a healthy cardiovascular system (Aadahl*etal.*,2009).Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines. The

goal is to improve all elements of fitness. Step aerobics is a method which allows us to do aerobics exercises for the purpose of getting a cardiorespiratory reaction from the concept of lifting your body weight ( Avdeeva&Belicheva., 2019).

Step aerobics, also known as bench aerobics and step training is a form of aerobic exercise that involves stepping on and off a small platform. Step aerobics is one of several low-impact aerobic exercises, along with water aerobics, dance aerobics and fast walking. Step aerobics is similar to climbing stairs but performed while staying in one place. The step platform itself is much less expensive and more portable than a Stairmaster and needs no electricity to operate. Music for step aerobics should be medium tempo, typically 118 to 122 beats per minute (bpm). A rhythm of 126–128 bpm is sometimes used for advanced classes; Reebok defined 128 bpm as the "fastest permissible speed. Step and bench devices are usually moulded polyethene plastic, covered in rubber or other non-slip surface, with the lowest height starting at 4 inches (10 cm). This height can be increased in 2-inch (5 cm) increments to 8 inches (20 cm). Studies have been made of 10- and 12-inch benches, but these are not recommended for popular step aerobics classes. The height of the step should be tailored to the individual; lower levels for beginners. Typical steps have a length and width of 43 by 16 inches (109 by 41 cm). A smaller product called Super Step was 28 by 14 inches (71 by 36 cm). It is a low-impact form of exercise that is less stressful on the joints than higher impact exercises such as jogging or running. Today, step aerobics is a very popular training method in many fitness centres around the country, and classes for this exercise method are offered where there is a group exercise program (Jabesa& Belay,2002).

Muscle growth "occur independent of an external load," and, in fact, all it takes to get sole is performing exercises through their full range of motion. A bodyweight squat, performed with immaculate technique, can be just as effective as traditional weight training methods, and, when it comes to building muscle, there's really no need to keep adding more and more weight to your barbell. Body-weight training — using only your body weight for resistance — can be an effective type of strength training and a good addition to your fitness program. Body-weight training can be as effective as training with free weights or weight machines. The Department of Health and Human Services recommends getting at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week, or a combination of moderate and vigorous activity. Aim to include strength training exercises for all major muscle groups into a fitness routine at least two times a week (Isler&Koşar,2006).

However, there have been few reports that have examined the influence of aerobic training and own body resistance on biochemical parameters of college men. We developed an aerobics training program for college men using a bench stepping exercise. The bench stepping exercise is a cost-effective, user-friendly, and practical exercise mode. We have already confirmed that this exercise program can improve the physical fitness levels and the health outcomes in the players representing various sports and games. We, therefore, hypothesized that this bench stepping exercise program along with own body resistance training can improve the biochemical variables of college men.

**Materials and methods**

For this purpose, only male athletes from central Travancore colleges of Kerala, India where randomly selected as subjects. Their age was ranged between 18-25 years. the selected forty-five subjects which are divided into three groups of fifteen each. Out of which, group I ($n$=15) underwent step aerobic exercises (*SAT*) and group two ($n$=15) underwent own body resistance training (*OBT*) and group III Control group (*CG*) ($n$=15) which did not undergo any specific training apart from their regular activities. The training program was carried out for three days per week during morning session only (6am to 8 am) for eight weeks. HDL cholesterol selected as a test variable for the study and it was assessed by Cholesterol oxidase enzymatic method using Boehringer Mannheim Kit. Three experimental groups initially performed through warming up exercises. After that group one performed Split step, I-step, t-step, straddle down, lunges, Repeater knee, v-step, straddle down, i-step, split step, Corner knee, Lunges, Over the top, t-step, repeater knee, Basic step, Corner knee, Repeater knee, t-step, over the top. Group Two performed own body resistance training exercises such as Press up, step up with knee raises, Groaner's, Spider crawl, standing long jump, Burpees, handstand wall walk, Frozen V sit, Single leg glute bridge, Pistol squat, Bench dip, Mountain climber, sit-up, reverse crunch, wide grip pull ups with moderate intensity.

**Data Analysis**

Mean and Standard deviation were calculated for HDL cholesterol of each group. And the data were analysed by using analysis of covariance (ANCOVA). If the F value was found to be significant for adjusted post-test mean, Scheffe's test was used as a post hoc test to determine the significant difference between the paired mean. Statistical significance was set to priority at 0.05 levels.

**Results and Discussion**

Table I

**Analysis of covariance of HDL-c of experimental groups and control group**

| Test | | SAT | OBT | CG | SOV | SS | df | MS | *F* |
|---|---|---|---|---|---|---|---|---|---|
| Pre test | Mean | 39.66 | 39.53 | 39.66 | B | 8.84 | 2 | 4.42 | .23 |
| | SD | 5.08 | 5.15 | 2.58 | W | 826.40 | 42 | 19.676 | |
| Post test | Mean | 55.40 | 54.93 | 39.06 | B | 2593.73 | 2 | 1296.86 | 59.89 |
| | SD | 4.74 | 5.53 | 3.34 | W | 909.46 | 42 | 21.65 | |
| Adjusted Post test | Mean | 55.40 | 54.93 | 39.06 | B | 2340.82 | 2 | 1170.41 | 115.90 |
| | | | | | W | 414.02 | 41 | 10.098 | |

*Significant F= (2,42) (0.05) =3.22;(P≤0.05) F= (df 2,41) (0.05) =3.21;(P≤0.05)

The table I showed that the pre-test mean values on HDL Cholesterol in the step aerobics group, the own body resistance training group and control group were 39.66, 39.53 and 39.66 respectively. The obtained F ration of 0.225 for the pre-test which was lower than the required table value 5.08 with df 2 and 42 at level of confidence. The post-test mean values of step aerobics, own body resistance training and control group were 55.40, 54.93 and 39.06 respectively. The obtained F ratio of 59.89 for post-test which was higher than the required table value 4.74 with df 2 and 42 at level of confidence. The adjusted post-test mean values on HDL cholesterol in step aerobics, own body resistance training group and control group were 55.40, 54.93 and 39.06. The obtained F ratio 115.902 for adjusted post-test which is higher than the required value 3.22 with df 2 and 41 for significance at the level of confidence on HDL cholesterol

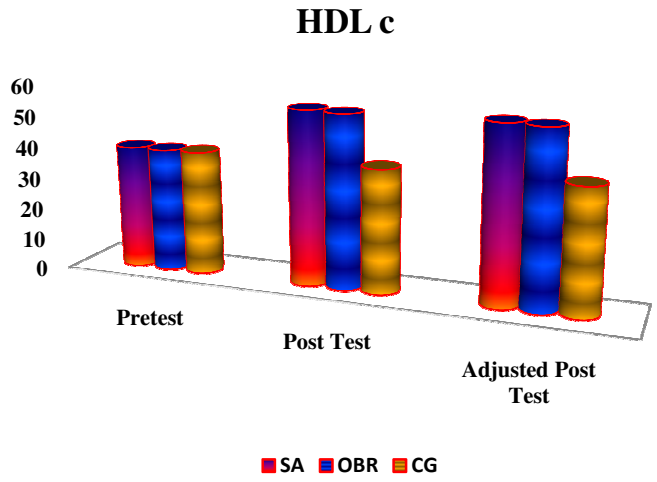


**Figure 1: The pre, post and adjusted post-test mean values of training group and the control group on HDL Cholesterol**

Hence the result of the study shows that there was a significance difference exists between step aerobics group, own body resistance training group and control group on HDL cholesterol. Further to determine which of the paired means has a significant improvement, Scheffe's test was applied as a post hoc test. The result of the following test was presented in table II.

**Table IIScheffe's post hoc test for mean difference between groups of HDL**

| SA | OBR | CG | MD | *CI* |
|---|---|---|---|---|
| 55.40 | 54.93 | | 0.47 | 11.02 |
| | 54.93 | 39.06 | 33.13 | |
| 55.40 | | 39.06 | 16.34 | |

The table II showed that the adjusted post-test mean difference in HDL Cholesterol between Step aerobics and control group, own body resistance 55.40 and 54.93 respectively. These values lesser than the required confidence interval value of 11.02 which shows there is no significance difference at the 0.05 level of confidence. The results of the study b showed that there was a significant difference between experimental groups and control groups. There values are 33.13 and 16.34 respectively which is higher than the required confidence interval value 11.02. It also showed that there was an insignificant difference between two experimental groups the value is 0.47 which is much lower than the required value 11.02. The pre, post and adjusted post-test mean valuers of experimental groups and control groups on HDL cholesterol is graphically represented in the figure 1.

College athletes should have adequate cardiac capacity to do rapid movements, delay lactic acid accumulation, quick recovery.Aadahl*et al*. (2009) explained that the step aerobics training can be sufficient to increase aerobic capacity and decrease body massdemands.Rakobowchuk *et al*.(2005)observed that the own body resistance training optimal methods make desirable changes in cardiovascular ability, for example reduction in fat percentage and increase in HDL, the facts which could leads about enhancement of college athletes'performance. Mann *et al*. (2013) found out that the step aerobics helps to lose weight, increased physical activity can lower your triglycerides, the most common type of fat in your body, while increasing your HDL levels. Benefits can be seen with as little as 60 minutes of moderate intensity aerobic exercise a week.The present study suggests that among college athletes having higher levels of HDL-cholesterol are associated with better functional performance.This study shows that there is significant greater deference in HDL level while doing Step aerobics. The combination of step aerobics and Own body resistance training also have significant difference. But in the case of own body resistance training alone has shown much significant difference between the pre- and post-test results of HDL. The control group doesn't show any significant difference during the pre and post-test for HDL.

**Conclusion**

Step aerobics and own body resistance training has a great impact on the HDL Cholesterol of the sportsman; training helps to improve the HDL cholesterollevel of the athlete. The training for 8 weeks showed positive significance on HDL cholesterol of college athletes. So, it is accessed that 8 weeks of Step aerobics and own body resistance training programme is very useful to improve the HDL Cholesterol level of athletes.

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