# INFLUENCE OF WEIGHTLIFTING ON BLOOD SUGAR AND LIPID PROFILE IN MEN

**Dr. Swati Bande** {Assistant Professor – Department of Zoology}

**M.M. College of Arts, N.M. Institute of Science & H.R.J. College of Commerce, Bhavan's College (Autonomous)**

**Ms. Shamal Keni** {M.Sc. - Department of Zoology}

**M.M. College of Arts, N.M. Institute of Science & H.R.J. College of Commerce, Bhavan's College (Autonomous)**

## 1. ABSTRACT

**Objectives**-To study the effect of a supervised, intensive training programme on lipid profile and blood sugar.
**Subjects**- The resistance exercise training group took part in supervised 45–50-minute resistance training sessions for four months. Subjects were randomly assigned to regular exercising group, a non-exercising control group and novice exercise group, the control group did not take part in any structured physical activity. Hundred men took part in this study.
This study aimed to determine the effect of weightlifting on blood glucose and lipid profile. The lipid profile includes cholesterol, triglycerides, high density lipoprotein (HDL), very low-density lipoprotein (VLDL), low density lipoprotein (LDL). Exercise causes increase in heart rate; this is linear relationship between heart rate and intensity of exercise.
**Result**-In the present study, blood sugar level was significantly higher in male weightlifters. The triglyceride level was less significant in regular exercise group of male weightlifters. The present study also revealed that, high density lipoprotein level was significantly higher in regular exercise group in male weightlifters.
**Conclusio**n-In the present investigation, weightlifting proved to be beneficial for the experimental group than the control and novice group. The present study showed that, regular weightlifting exercises are beneficial for reduce the risk of coronary heart disease, lower resting heart rate and blood pressure, increase the immunity and avoid the stress.

## 2. INTRODUCTION

Sport play an important role in keeping us physically fit. Industrialization increased leisure time of the citizens of developed and developing countries, lead to, greater participation in athletic activities, and increased accessibility [1]. Physical exercise keeps the body fit and trim and maintain body weight and strength thus ensuring healthy eating habits and also acts like medicine for the health and also improve our immune system and act as a barrier in most allergic symptoms, such as sinusitis, cough, and mild flu symptoms. In short, participation in sports has both a positive and negative impact on body's ability to sustain it [2].
The sport, weightlifting according to had a great importance in naturally measuring strength. At present, weightlifting event contains two lifts, snatch, and clean and jerk. Weightlifting is a strength sport that consists of three attempts at maximal weight on three lifts: As in the sport of Olympic weightlifting, it involves the athlete attempting a maximal weight single-lift effort of a barbell loaded with weight plates.
Physical activity is important for everyone with diabetes. Most forms of aerobic/cardiovascular exercise will lower your glucose levels, while activities in weightlifting can raise it. Any increase in energy expenditure requires rapid adjustments in blood flow that affect the entire cardiovascular system. Exercise causes increase

in heart rate; this is linear relationship between heart rate and intensity of exercise. During light exercise, the first increase in heart rate may be exaggerated but subsequently it diminishes to a lower level. However, during prolonged work done, there is tendency for the heart rate to increase as the exercise progresses.

The maximum heart rate recorded in this situation is considered as maximum attainable heart rate. The decrease in maximum heart rate with increasing age is a sign of general reduction of biological functions [3].

The exercise increases level of HDL cholesterol. HDL cholesterol is the good cholesterol and acts to clean the artery wall, which in turn reduces atherosclerosis and decreases the number of triglycerides in the bloodstream. Triglycerides are another type of fat and high levels in the blood stream have been linked with increased risk of heart disease [4] . Lipid profile is a test to assess the status of fat metabolism in the body. It includes measuring the lipid and its derivatives. The lipid profile includes cholesterol, triglycerides and lipoprotein. The lipoproteins are macromolecule complex that play an important role in transport and metabolism of lipid in blood. The level of cholesterol in the blood is measured in milligram per decilitre (mg/dL). The lipid profile includes cholesterol, triglycerides, high density lipoprotein (HDL), very low-density lipoprotein (VLDL), low density lipoprotein (LDL). Cholesterol to HDL serum cholesterol is starting ingredient for the synthesis of the steroid hormones. It is also the precursor for which body synthesizes vitamin D. It also synthesizes bile acid in liver. High cholesterol value causes arteriosclerosis and heart attack. Low cholesterol value results in hyperthyroidism and anaemia.

## 3. MATERIALS AND METHODS

For the present study, the weightlifters were selected as subjects randomly based on different age groups ranged between 20-30 yrs males. The regular exercising group was performing regular weightlifting exercises daily, novice group was new to exercise. The control group was sedentary and irregular in exercising. Subjects reported to the human performance laboratory between 7:00 am and 10:30 am, 12 hours after eating a meal. Subjects were asked to refrain from strenuous physical activity before blood sampling. Further blood samples were drawn Blood samples (10 ml) were collected by venipuncture.

The present study was aimed to study haematological parameters in the above three groups using blood samples, collected from weightlifters.

The blood samples collected from the subjects were analyzed using auto analyzer.

Sugar was estimated in serum samples by glucose-oxidase- peroxidase (GOD-POD) method [5] using 'Erba' reagent kit.

**Observation Table for blood sugar:**

| | | N | Mean | ±SD | SE | Min | Max | F | P |
|---|---|---|---|---|---|---|---|---|---|
| Blood Sugar | Exercise | 23 | 93 | ±13.03 | 2.72 | 68 | 130 | 3.560 | <0.05 |
| | Control | 20 | 87 | ±11.95 | 2.67 | 70 | 110 | | |
| | Novice | 20 | 87 | ±11.95 | 2.67 | 70 | 110 | | |
| | Total | 63 | 89 | ±12.47 | 1.57 | 68 | 130 | | |

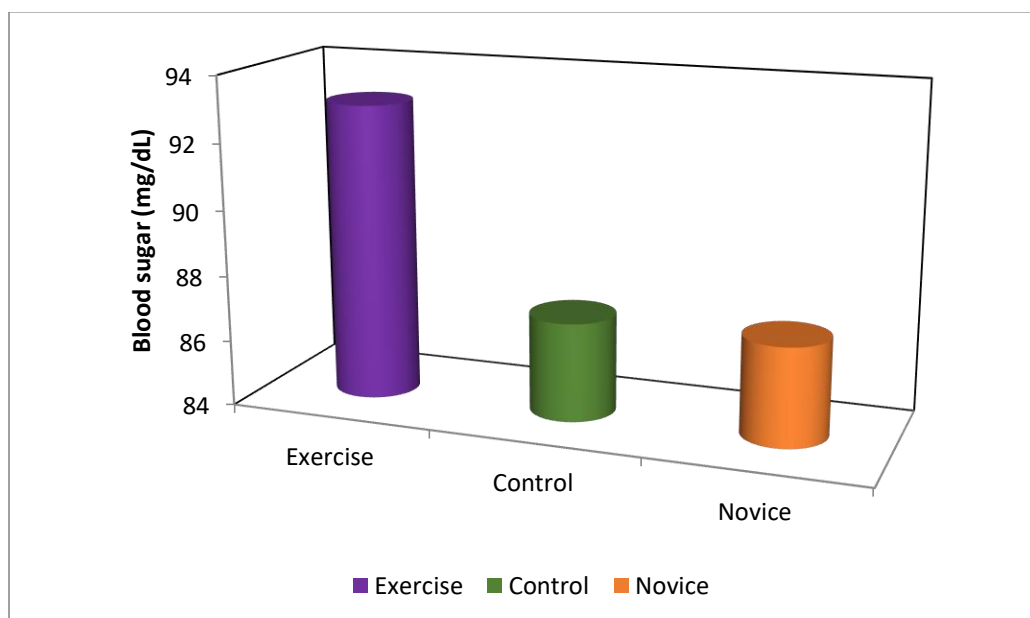**Table1: Comparative assessment of blood sugar (mg/dL) in blood samples of male     weightlifters.**

**Fig.1: Comparative assessment of blood sugar (mg/dL) level in blood samples of male weightlifters.**

**Observation Table for Lipid profile**

|  |  | N | Mean | ±SD | SE | Min | Max | F | P |
|---|---|---|---|---|---|---|---|---|---|
| TG | Exercise | 23 | 92 | ±34.81 | 7.26 | 47 | 150 | 7.084 | <0.01 |
|  | Control | 20 | 116 | ±15.32 | 3.42 | 85 | 137 |  |  |
|  | Novice | 20 | 116 | ±15.32 | 3.42 | 85 | 137 |  |  |
|  | Total | 63 | 107 | ±26.63 | 3.36 | 47 | 150 |  |  |
| Total CHO | Exercise | 23 | 140 | ±30.78 | 6.42 | 101 | 194 | 5.525 | <0.01 |
|  | Control | 20 | 175 | ±44.75 | 10.01 | 128 | 302 |  |  |
|  | Novice | 20 | 175 | ±44.75 | 10.01 | 128 | 302 |  |  |
|  | Total | 63 | 162 | ±43.03 | 5.42 | 101 | 302 |  |  |
| HDL | Exercise | 23 | 81 | ±34.28 | 7.15 | 17 | 150 | 13.256 | <0.01 |
|  | Control | 20 | 52 | ±6.44 | 1.44 | 42 | 64 |  |  |
|  | Novice | 20 | 52 | ±6.44 | 1.44 | 42 | 64 |  |  |
|  | Total | 63 | 63 | ±25.26 | 3.18 | 17 | 150 |  |  |
| VLDL | Exercise | 23 | 21 | ±8.19 | 1.71 | 9 | 31 | .153 | .859 |
|  | Control | 20 | 22 | ±2.33 | 0.52 | 17 | 26 |  |  |
|  | Novice | 20 | 22 | ±2.33 | 0.52 | 17 | 26 |  |  |
|  | Total | 63 | 22 | ±5.22 | 0.66 | 9 | 31 |  |  |
| LDL | Exercise | 23 | 73 | ±29.3 | 6.12 | 8 | 119 | 2.294 | .110 |
|  | Control | 20 | 83 | ±3.82 | 0.85 | 74 | 89 |  |  |
|  | Novice | 20 | 83 | ±3.82 | 0.85 | 74 | 89 |  |  |
|  | Total | 63 | 80 | ±18.40 | 2.32 | 8 | 119 |  |  |

**Table 2:Comparative assessment of triglyceride, (TG)(mg/dL), Cholesterol(CHO) (mg/dL), high density lipoprotein (HDL) (mg/dL), very low density lipoprotein (VLDL) (mg/dL) and low density lipoprotein (LDL)(mg/dL) levels in blood samples of male weightlifters.**
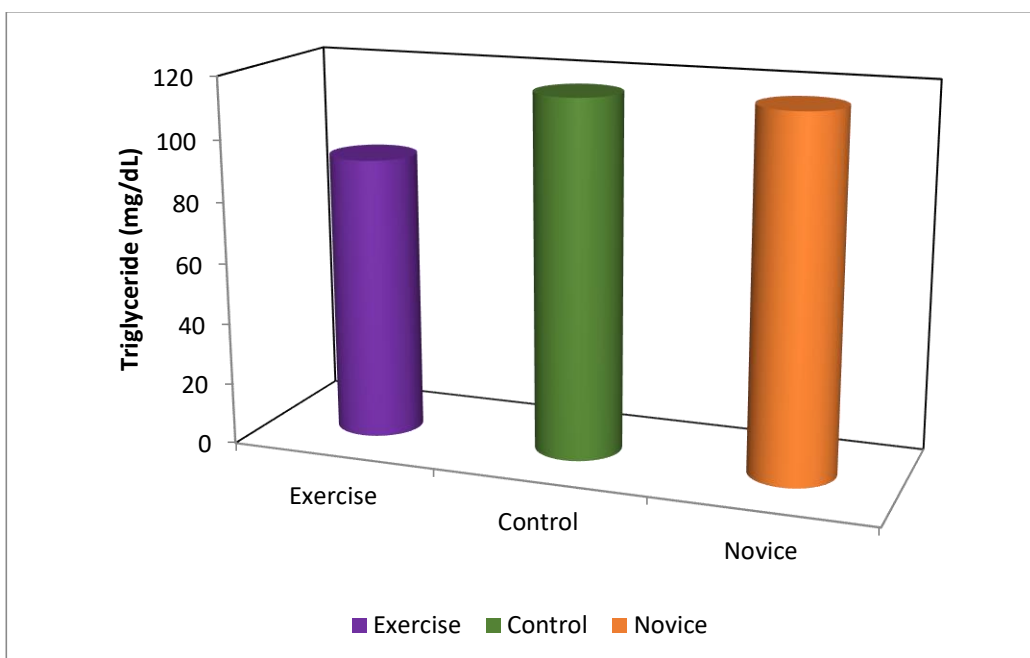
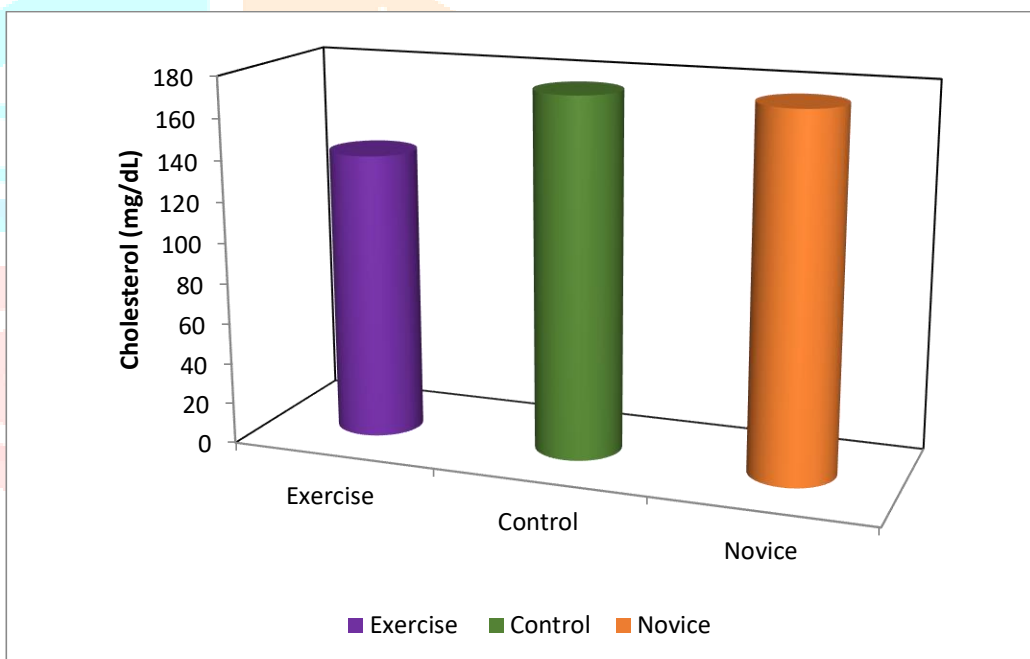**Fig.2: Comparative assessment of triglyceride (TG) (mg/dL) level in blood samples of male weightlifters.**



**Fig.3: Comparative assessment of cholesterol (CH0) (mg/dL) level in blood samples of male weightlifters.**
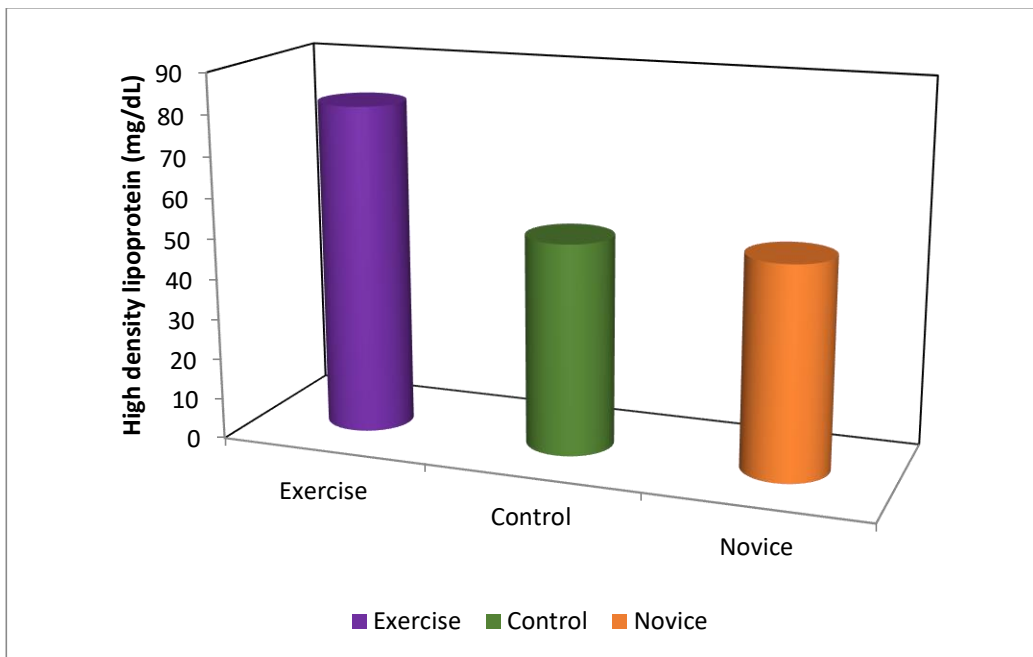
**Fig. 4: Comparative assessment of high-density lipoprotein (HDL) (mg/dL) level in blood samples of male weightlifters**
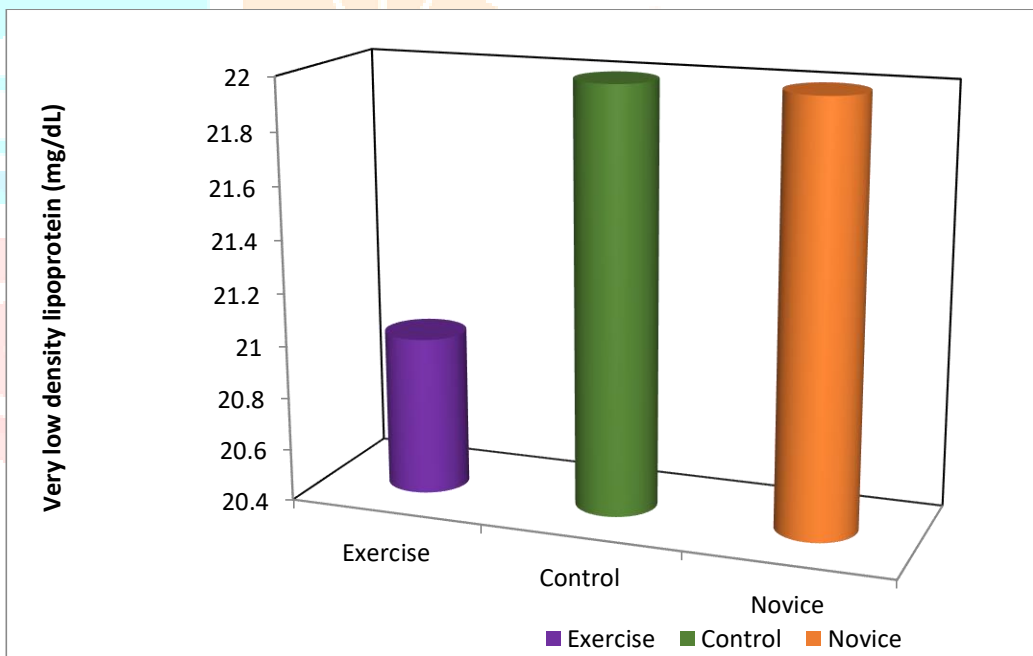


**Fig.5: Comparative assessment of very low-density lipoprotein (VLDL) (mg/dL) level in blood samples of male weightlifters.**
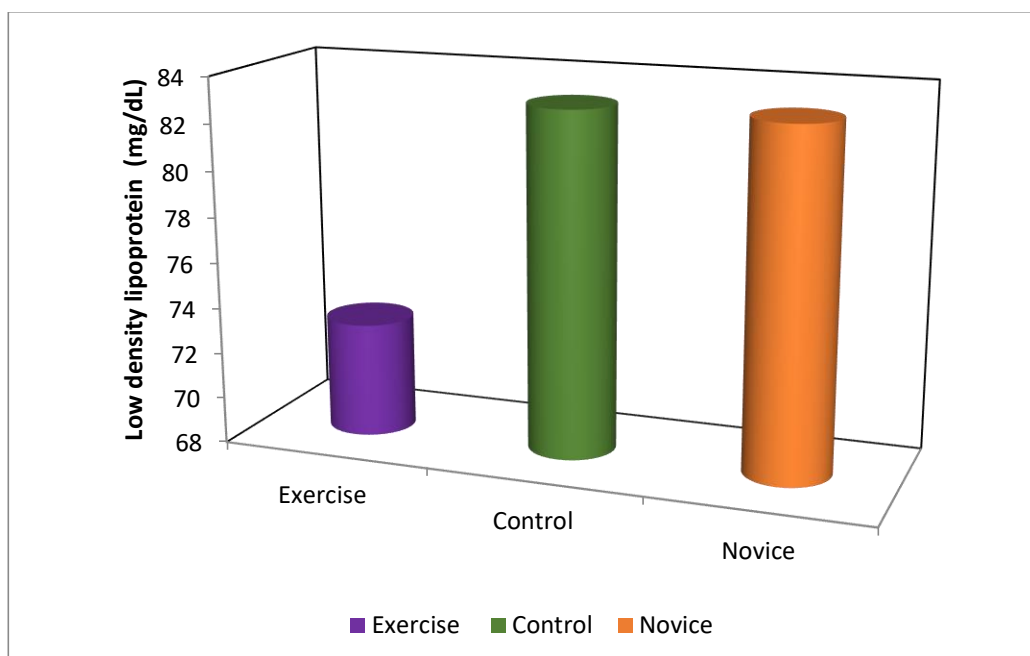
**Fig.6: Comparative assessment of low density lipoprotein (LDL) (mg/dL) level in blood samples of male weightlifters.**

## 4. RESULT

The results showed that the average blood sugar level of regular exercise group of male weightlifters varied from 68 mg/dL to 130 mg/dL, for the control group, it varied from 70 mg/dL to 110 mg/dL, whereas for the novice group, it varied from 70 mg/dL to 110 mg/dL**.**The comparative assessment showed that blood sugar level of regular exercise group was significantly ($P<0.05$) higher than the control and novice group of male weightlifters. It was evident from the data that the average triglyceride of regular exercise group of male weightlifters varied from 47 mg/dL to 150 mg/dL, for the control group, it varied from 85 mg/dL to 137 mg/dL, whereas for novice group, it varied from 85 mg/dL to 137 mg/dL. The comparative assessment showed that average triglyceride of regular exercise group of male weightlifters was significantly ($P<0.05$) less than control and novice group.

Furthermore, the average cholesterol level of regular exercise of male weightlifters varied from 101 mg/dL to 194 mg/dL, for the control and novice group, it varied from 128 mg/dL to 302 mg/dL . The comparative assessment showed that the average blood cholesterol level of regular exercise group of male weightlifters was significantly ($P<0.05$) less than the control and novice group.

The results the average HDL level of regular exercise group of male weightlifters varied from17 mg/dL to 150 mg/dL, for the control group, it varied from 42 mg/dL to 64 mg/dL, whereas for the novice group, it varied from 42 mg/dL to 64 mg/dL. The comparative assessment showed that HDL level of regular exercise group of male weightlifters was significantly ($P<0.05$) more than the control and novice group.

It was also evident that the average VLDL level of regular exercise group of male weightlifters varied from 9 mg/dL to 31 mg/dL, for the control group, it varied from 17 mg/dL and 26 mg/dL, whereas for novice group, it varied from 17 mg/dL to 26 mg/dL. The comparative assessment showed no significant difference amongst all three groups of male weightlifters with respect to their VLDL.
        In addition to this, the average LDL level of regular exercise group of male weightlifters varied from 8 mg/dL and 119 mg/dL, for control group, and novice group, it varied from 74 mg/dL to 89 mg/dL. The comparative assessment showed no significant difference amongst all three groups of male weightlifters with respect to LDL levels.

## 5. CONCLUSION

 In the present study, blood sugar level was significantly higher in male weightlifters. The average blood cholesterol level of regular exercise group of male weightlifters was significantly less than the control and novice group.

 HDL level of regular exercise group of male weightlifters was significantly more than the control and novice group. The triglyceride level was less significant in regular exercise group of male weightlifters. The present study also revealed that, high density lipoprotein level was significantly higher in regular exercise group in male weightlifters. In 1979, **Huttuen[6]** studied effect of moderate physical exercise on serum lipoprotein and reported that there was decrease in Cholesterol, TG, VLDL, LDL which were statistically significant and increase in HDL was highly significant after 4 months of moderate exercise. **Blumenta**l et al., in 1991[7] studied the effect of exercise training on cardiovascular function in men and women.  **Schuler et** al., in 1992 [8] also studied regular physical exercise and low-fat diet and effects on progression of coronary artery disease and reported the decrease in Cholesterol, LDL, VLDL and increase in HDL levels in exercising groups.  In the present investigation, weightlifting proved to be beneficial for the experimental group than the control and novice group.  The present study showed that, regular weightlifting exercises are beneficial for reduce the risk of coronary heart disease, lower resting heart rate and blood pressure, increase the immunity and avoid the stress.

## 6. REFERENCES

1. McArdle, W.D., Katch, F.I. and Katch, V.L. (2000). Essentials of Exercise Physiology. Philadelphia, PA: Lippincott Williams & Wilkins, 2.

2. Chaput , Jean-Philippe, Klingenberg, Gilbert, and Tremblay (2011). Physical Activity Plays an Important Role in Body Weight Regulation, J.Obes.,56(2):89-95.

3. Carl, C. Bell, (1979). Endurance, strength and coordination exercises without cardiovascular and respiratory stress. J. Natl. Med. Assoc, 71(3):265–270

4. Powell K. E., Thompson, P. D., and Caspersen, C. J. (1987). Physical activity and the incidence of coronary heart disease. Annual Review of Public Health, 8(3): 253-287.

5. Trinder, P. (1969). Estimation of fasting blood glucose in serum. Ann. Clin. Biochem, 6(2):24-7.

6. Huttuen, Jussi, K., and Lansimics, E. (1979). Effect of moderate physical exercise on serum lipoprotein. Pub.Med.,  60(6):1220-1229.

7. Blumental, J. A., and Charles, F.E. (1991). Effect of exercise training on cardiovascular function in men and women above 60 years age. Am.J. Cardiol ., 67(2):633-639.

8. Schuler, Gerhard, Rainer Hambrecht (1992). Regular physical exercise and low fat diet. Effects on progression of coronary artery disease . J Strength Cond. Res., 86:1-11.