ISSN (Print) : 0974-6846
**Indian Journal of Science and Technology,** *Vol 8(8), 720-728, April 2015* ISSN (Online) : 0974-5645

# Impact of Aerobic and Aerobic Cross Training on Coronary Heart Disease (CHD) and Bio-motor Variables among Obese Males

**Kaukab Azeem* and C. Antony Varghese**

Physical Education Department, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia; kaukab@kfupm.edu.sa

## Abstract

**Objective:** To find out the effect of aerobic and aerobic cross training programs on coronary heart disease and bio-motor variables among obese males from pre to post-test. **Method:** The design of this study carried out experimental research with a pre and post test for two groups formed on the basis of Body Mass Index (BMI). **Subjects:** Sixty obese male subjects from King Fahd University of Petroleum and Minerals will be selected to participate in the study. Age of the participants was in the range between 18 and 22 years. Subjects were segregated into two groups namely (aerobics training group, aerobic cross training group). The duration of the training program was 45 minutes per session, twice per week. All the participants from both the groups were tested prior and after 12 weeks of program. The selected Coronary Heart Disease (CHD) variables were tested at the KFUPM clinic laboratory. Bio-motor variables will be tested by the investigators at the physical education department. **Statistical Analysis:** Mean S.D and t-test were computed for pre and post data scores analysis to find the difference among groups. The level of significance was set at .05 levels and SPSS 16 was used for analysing data. **Results and Discussion: Coronary heart disease variables:** The analyzing of data reveals that both the groups, Aerobic Training Group (ATG) and step Aerobics Training Group (ACTG) improved from pre to post test in all the selected coronary heart diseases variables. **Bio-Motor variables:** The analyzing of data reveals that the selected bio-motor variables from pre to post test among both the groups had revealed improved performance. **Conclusion:** It was concluded that the both the groups Aerobic Training Group (ATG) and step Aerobics Training Group (ACTG) had shows significant improvement in all the selected coronary heart diseases variables selected bio-motor variables.

**Keywords:** Aerobic, Bio-Motor, Diseases, Training

## 1. Introduction

Obesity is a chronic disease and growing threat globally today. Aerobic exercise is designed to produce a sustained increase in heart and whose energy cost can be met by the body from aerobic sources, that is, from increased oxygen consumption[3]. Obesity leads to cardio-vascular disease, diabetes[12].

An overweight person becomes obese when the fat percentage in the body exceeds 20%. Obesity is a hazardous scourge that is menacing in its proportions. It has managed to annul all developments in medicine that have helped humankind to have an improved and longer life. Obesity is on a continuous rise in case of children too and the percentage of obese children has almost doubled in the recent past[11].In obese children, fat molecules and

* *Author for correspondence*

cholesterol get deposited in the veins and arteries, causing blockage and eventually a heart attack. Some of the risks of obesity include Hypertension, Stroke, Type 2 Diabetes, Osteoarthritis, heart attacks and Coronary heart diseases.

Control and overcome the situation, the obese personals needs to start by eating healthier food and exercising more. It is a decision that the overweight individual has to make it and stick to regular exercise. Fitness is becoming the highest priority on the agenda of the modern era. The real fact is that regular exercise can develop physical, physiological, and psychological fitness and improves the sense of well being and enhances self image. Exercise is the key to overcome the adverse metabolic effects passed on to offspring by their overweight mothers, with research showing for the first time these effects can be almost completely reversed through physical activity. Being an obese mother can have a powerful impact on the next generation, altering central appetite circuits and contributing to increased fat deposits, glucose intolerance, and metabolic disease in offspring. Every individual needs to follow an exercise schedule to remain in top condition since there several good reasons why you should start exercising. The reasons are that exercise contributes to fat loss, prevent chronic diseases, enhances state of mind, enhances wellness, and also increases social capabilities.

One of the most important aspects of health-related fitness is the cardiovascular endurance or the aerobic capacity of an individual. Aerobic fitness can be defined as the ability to take in, transport, and utilize oxygen. Since aerobic fitness involves many important organs and systems, it tells much about the health of these components and about the health in general. When aerobic fitness is high, physical and mental health is enhanced[1]. The benefits of aerobic exercise and fitness include improved circulation and respiration; reduced risk of heart diseases; improved fat metabolism and reduced body weight (fat free body mass); strengthened bones, ligaments and tendons; personality changes like enhanced self-concept and body image and emotional stability. The increased capacity and adaptability associated with aerobic fitness can add life to your years, not just years to your life.

The heart becomes stronger and more effective as a pump resulting in a slower resting heart rate and a smaller increase in exercise heart rate for a given amount of work. The strength and endurance of the respiratory muscles increase resulting in an increase of the interior volume of the lungs. Consequently, more interior surface is available for the exchange of gases with the circulatory system, which again allows one to exercise longer and at a higher intensity before becoming fatigued. The capillaries, the tiny blood vessels that deliver nutrients to tissues increase in number and provide more surface area for the exchange of oxygen and carbon dioxide between the blood and cells. This increase in capillaries also speeds up the rate of exchange of nutrients and the removal of waste products of cell metabolism so that the efficiency of blood digestion and waste elimination is increased. Length of life or added longevity has meaning not only in calendar years or months but also in the quality of life preserved or extended. Quality of life may be assessed in various ways related to fitness, fulfillment and satisfaction. Besides socio-economic and health consideration, there are invaluable cultural and philosophical or spiritual aspects.

In one the recent research regard to cross-sectional study was conducted in the Department of Cardiology of a tertiary care centre in North Karnataka, India. A group of total number of 50 patients complaining with chest pain and RBBB (both complete and incomplete) on ECG were included. The participants underwent chest X-ray, ECG and 2D echocardiography. Coronary angiography was done in the eligible patients and the findings with regard to LAD, ramus, LCX, OM and RCA were noted. Mostly the patients were males (88%) and the age group was more than 60 years (48%). History of hypertension, diabetes and hyperlipidemia were noted in 56%, 36% and 26% respectively. Personal history of smoking was reported by 52% while tobacco chewing and alcohol consumption was reported by 22% and 30%. Myocardial infarction was noted 48% of the patients and anterior wall MI was present in 62.5%. Abnormal coronary angiographic findings were noted in 82% and 48% of the patients had multi-vessel disease with involvement of proximal LAD (54%). A significant relationship was found between coronary artery disease and male sex, age more than 60 years, comorbid conditions, habits, hyper

triglyceridemia, low HDL, troponin. There was a high rate of CAD in patients presenting with chest pain and RBBB. Angiography may be recommended among these patients to rule out the presence of CAD so as to advocate the effective management strategy[26].

In this Korean study it was revealed and stated that to target and consider to concern on health, utility of health information challenge feeling and attitude, funny and interesting of health information, experience of using health information, household income in planning projects or program on health information[20].

This study identified the relation between participant's use of bicycles and the difference in their sense of balance (static, dynamic balance), muscle strength (upper body, lower body), self-esteem and depression. By doing so, the study aims to provide a basic set of data that can be used for the development of nursing mediation programs that can promote more cycling among the subjects. The study results show that cyclist participants had a shorter dynamic balance time compared to non-cyclists, while their upper and lower body's muscle strength was stronger and their depression lower. In terms of the correlation with cycling, the longer they had been cycling their time for dynamic balance was shorter and the more sessions there were for cycling per week, the higher their self-esteem[13].

In this study it was investigated to provide a basic set of data on measures to improve depression in lower income participants by investigating pain, perceived health, nutritional risk, social support, self-transcendence and depression among this population group. The findings show that higher pain and nutritional risk, and lower perceived health, social support and self-transcendence were correlated with higher depression, and the factors affecting depression were social support, perceived health, nutritional risk and number of diseases in descending order of impact. Overall explanatory power was 44.4%. In order to improve depression in lower income subjects based on this study, establishing a social support system is of greatest importance. Additionally, measures to improve their nutrition and health and reduce chronic diseases would also have to be implemented persistently. Social organizations and religious groups can also contribute to this effort[14].

In this Korean research study it was revealed that the significance of this research is that it presented a basic data for the introduction of the notion of happiness and the humanistic fusion to the curriculum of health-related university by investigating the perception types on happiness of the health-related university students. Although the influence of the objective indexes like the economic status and external appearance on the feeling of happiness of the health-related university students should not be overlooked, the result of this research that the perception on happiness can be controlled through the self-contentment and inner value system shows the necessity to include the varied viewpoints on happiness of people and health professionals in the curriculums of the health-related university education. The results, of this study that perception on happiness of health-related university students varies depending on individual backgrounds and subjective dispositions, measures to improve happiness with various activities are needed. Future studies are recommended to refer to the characteristics of the three types drawn out in this study when applying the concept of happiness to curriculums of health-related university students[35]. Exercise prove to be a simple, very important, method of improving aspects of children's mental functioning that are central to cognitive and social development[6].Stroke remains a major healthcare problem. Approximately 795 000 individuals in the USA have a stroke each year, of which about 610 000 are a first attack; and 6.4 million Americans are stroke survivors. Stroke is also estimated as a result 134 000 deaths annually[8].Obesity is defined as a condition of abnormal or excessive fat accumulation in the fat tissues (adipose tissue) of the body leading to many health hazards[16].Obesity has a high prevalence in children living in industrialized countries and fat intake is associated with adiposity in children[17].Efforts to prevent further weight gain in adults at risk for overweight and obesity are essential[21].Moreover, pathogenesis of obesity is far more complex than the simple example of an imbalance between energy intake and energy output[22]. Reasons for the decline in physical activity is needed to be further address and interventions are needed to assist the youth in maintaining healthful levels of physical activity[28]. Overweight affects 30 -80% of adults in the countries of the WHO European Region. About 20% of children and adolescents are overweight, and a third of these are obese[29].In this study it was opined that they believe the

failure of this and other research studies on weight loss is justification to abandon the effort: researchers in this field have achieved a great deal in the past, and examples presented above of some of the exciting cutting edge research indicate why we should be optimistic about the future[30].A extra personalized approach is recommended when aiming exercise programs in a clinical weight loss setting in order to limit the compensatory changes associated to exercise-induced weight loss[31].

In a conducted research survey it was found 60% of the students of KFUPM were either overweight or obese[25]. Keeping these facts in the mind we had taken up this study to help in a small way to our students of this university to improve their health and maintain a quality of life.

## 2. Objectives

The ultimate goal of this research project is to study the impact of aerobic and aerobic cross training on the selected Coronary Heart Disease (CHD) and bio-motor variables. The training will emphasize on the reduction of Body Mass Index (BMI) among obese males. Furthermore to bring awareness about the aerobic and aerobic cross training methods which effects on the Coronary Heart Disease (CHD) and selected bio-motor variables among obese males. The main goal can be achieved through following objectives.

1. To design an effective aerobic training program for obese males
2. To design an effective aerobic cross training program for obese males
3. To supervise, implement and administer the program on the participants.
4. To find the changes on the selected Coronary Heart Disease (CHD) variables.
5. To find out the effect of aerobics and aerobic cross training on selected bio-motor variables.
6. To find out the difference in performance between aerobics training group and aerobic cross training group.
7. To make recommendations

## 3. Method

The tests considered for this study is namely, body composition (BMI) and some Coronary Heart Disease (CHD), (High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL), Total Cholesterol (TC), Blood pressure, Percent body fat, Lean body mass) and bio-motor variables, (Cardio-vascular endurance, Speed, Muscular strength, Flexibility). BMI of subjects will be finding by (weight in kgs, height in meters, with the help of electronic weighting machine and stadiometre respectively, and calculated with the help of weight in kgs/height in $(m)^2$ **(Table-1)** . For analyzing the data from pre to post test the following statistical tools will be considered, mean, standard deviation, and t-test, with the help of statistica software.

**Table 1. Selected test for coronary heart disease and bio-motor variables**

| CORONARY HEART DISEASE VARIABLES | BIO-MOTOR VARIABLES |
|---|---|
| HDL | CARDIO-RESPIRATORY ENDURANCE |
| LDL | MUSCULAR STRENGTH |
| TOTAL CHOLESTROL | MUSCULAR ENDURANCE |
| BLOOD PRESSURE | SPEED |
| PERCENT BODY FAT | FLEXIBILITY |
| LEAN BODY MASS | |

### 3.1 Selection of Subjects

The purpose of this study is to find out the effect of aerobic training and aerobic cross training on Coronary Heart Disease (CHD) and bio-motor variables among obese males.

To achieve the purpose of this study a group of 60 obese males will be selected randomly from the King Fahd University of Petroleum & minerals, Saudi Arabia. The age of the selected participants will be between 18 to 22 years. The participants more than 30+ BMI will be considered for this study and will be segregated into two groups namely aerobic training group (N=30), and aerobic cross training group (N=30). Aerobic and aerobic cross training is considered to employ on the obese males for 12 weeks, weekly 2 times, 45 minutes of training per session.

### 3.2 Selection of Variables

The researcher will review the various scientific literatures

pertaining to the different aerobic exercises on selected coronary heart disease risk factors and bio-motor variables from books, journals, periodicals, health magazines and research papers.

Keeping all facts in the total frame of my mind the following consideration is made with regard to feasibility criteria, availability of instruments, and the relevance of the variables of the present study, the following variables were consider for this study given below. Dependent Variables i.e. coronary heart disease and bio-motor variables mentioned in the below given tables; (**Table 2)** and (**Table 3**). Moreover Independent variables: 1**.** Aerobic training 2. Aerobic cross training was mentioned in (**Table 4).**

**Table 2. Selection of test \ Dependent variables\ Coronary heart disease**

| S.No | Criterion measures | Test | Unit of measurements |
|---|---|---|---|
| 1 | High Density Protein (HDL) | Laboratory method | Mg\dl |
| 2 | Low density Protein (LDL) | Laboratory method | Mg\dl |
| 3 | Total cholesterol | Laboratory method | Mg\dl |
| 4 | Blood pressure (systolic & diastolic ) | sphygmomanometer | Mm\hg |
| 5 | Percent body fat | Skin fold caliper | { 4.570 –4.142}x 100 Density |
| 6 | Lean body mass | Skin fold caliper | Total body weight – Total weight of fat |

**Table 3. Selection of test \ Dependent variables\ Bio-motor variables**

| S.No | BIO-MOTOR VARIABLES | Test | Unit of measurements |
|---|---|---|---|
| 1 | Cardio-respiratory endurance | 12 min run \walk | Meters |
| 2 | Muscular strength | Parallel bench press 1RM | 1 RM (Kgs) |
| 3 | Muscular endurance | Sit-ups (30 sec) | Numbers |
| 4 | Speed | 30 M Sprint | Seconds |
| 5 | Flexibility | Sit and reach test | Cm |

**Table 4. Training Program (Independent Variables)**

| Sl.no | Description | Program targets |
|---|---|---|
| 1 | Total training program | 12 weeks |
| 2 | Weekly | 2 times |
| 3 | Training per session | 45 min |
| 4 | Aerobics training | Walking |
| 5 | Aerobic cross training | Walking (30 min) and step aerobics (15 min) |
| 6 | Test (Test will be employed before and after the 12 weeks of training) | Pre and post test |
| 7 | The program will be conducted as per the | FITT principle |

### 3.3 Instrument Reliability

Standard equipments were used to assess the dependent variables. Blood lipids was analyzed in (bio-chemical laboratory) and blood pressure with the help of (sphygmomanometer), measured at the KFUPM clinic, Dhahran. Body mass index (height and weight), total fat percent and lean body mass index was measured with the help of standardized and best instruments.

### 3.4 Orientation of the Subjects

The investigator explains the purpose of this study to the subjects. The doubts of the subjects were address now and then and the instructions were given to the participants with regard to attendance, their active participation during the training program from pre to post test.

## 4. Result and Discussion

The analyzing data for ATG group and ACTG group is presented in the Table 5 by the help of statistical tools i.e. mean, SD and t test for selected coronary heart diseases variables.

The analyzing of data reveals that the mean and standard deviation with regard to High Density Protein (HDL) of Aerobic Training Group (ATG) from pre to post test were (54.26, 1.85) and (55.10, 0.96) respectively. High Density Protein (HDL) of Aerobic Cross Training Group (ACTG) from pre to post were (54.77, 0.91) and (55.86, 1.02) respectively. Low Density Protein (LDL) of (ATG) had

**Table 5.** **Speaks about mean, SD and t-test for ATG and ACTG groups with regard to the selected coronary heart diseases variables**

| Variables | Test | ATG Group N=30 | | | ACTG Group N=30 | | |
|---|---|---|---|---|---|---|---|
| | | Mean | S.D | P-value | Mean | S.D | P-value |
| High density protein (HDL) | Pre | 54.26 | 1.85 | 0.014 | 54.77 | 0.91 | 0.00* |
| | Post | 55.10 | 0.96 | | 55.86 | 1.02 | |
| Low density protein (LDL) | Pre | 120.14 | 1.73 | 0.000* | 123.86 | 1.72 | 0.00* |
| | Post | 111.28 | 1.75 | | 112.54 | 1.99 | |
| Total cholesterol | Pre | 213.54 | 12.04 | 0.000* | 218.23 | 11.33 | 0.000* |
| | Post | 202.50 | 6.57 | | 207.69 | 9.27 | |
| Systolic pressure | Pre | 121.60 | 1.16 | 0.002 | 121.76 | 1.24 | 0.000* |
| | Post | 121.20 | 1.15 | | 121.35 | 0.99 | |
| Diastolic pressure | Pre | 81.87 | 1.17 | 0.000* | 82.26 | 1.11 | 0.000* |
| | Post | 80.67 | 0.48 | | 80.83 | 0.87 | |
| Percent body fat | pre | 23.14 | 1.29 | 0.000* | 23.74 | 2.04 | 0.000* |
| | post | 20.70 | 0.65 | | 21.06 | 0.74 | |
| Lean body mass | Pre | 50.97 | 1.56 | 0.000* | 51.27 | 1.51 | 0.000* |
| | post | 52.49 | 1.90 | | 53.30 | 1.44 | |

* Significance difference from pre to post test ($p< 0.05$)

shows mean, standard deviation from pre to post test were (120.14, 1.73) and (111.28, 7.75) respectively. Mean and standard deviation from pre to post test regard to (LDL) pertaining to Aerobic Cross Training Group (ACTG) were (123.86, 1.72) and (112.54, 1.99) respectively. Blood pressure (systolic pressure) of (ATG) had shows mean, standard deviation from pre to post test were (121.60, 1.16) and (121.20, 1.15) respectively. Blood pressure (systolic pressure) of (ACTG) had shows mean, standard deviation from pre to post test were (121.76, 1.24) and (121.35, 0.99) respectively. Blood pressure (diastolic pressure) of (ATG) had shows mean, standard deviation from pre to post test were (81.87, 1.17) and (80.67, 0.48) respectively. Blood pressure (diastolic pressure) of (ACTG) had shows mean, standard deviation from pre to post test were (82.26, 1.11) and (80.83, 0.87) respectively. Data reveals about percent body fat of (ATG) which shows the mean, standard deviation from pre to post test were (23.14, 1.29) and (20.70, 0.65) respectively. Percent body fat regard to (ACTG) had shows mean, standard deviation from pre to post test were (23.74, 2.04) and (21.06, 0.74) respectively. Lean body mass of (ATG) reveals the analyzing of data with mean, standard deviation from pre to post test were (50.97, 1.56) and (52.49, 1.90) respectively. With regard to lean body mass pertaining to (ACTG) had shows mean, standard deviation from pre to post test were (51.27, 1.51) and (53.30, 1.44) respectively. The analyzing data presents about (Table 5).

The analyzing data for ATG group and ACTG group is presented in the Table 6 by the help of statistical tools i.e. mean, SD and 't' - test for selected bio-motor variables. The analyzing of data reveals that the mean and standard deviation with regard to cardio-respiratory endurance of Aerobic Training Group (ATG) from pre to post test were (1256.67, 209.16) and (1433.33, 239.37) respectively. Cardio-respiratory endurance of Aerobic Cross Training Group (ACTG) from pre to post were (1233.33, 217.48) and (1488.67, 209.84) respectively. Muscular strength of (ATG) reveals that the analyzing of data with mean, standard deviation from pre to post test were (31.50, 6.84) and (41.67, 7.80) respectively. With regard to muscular strength pertaining to (ACTG) had shows mean, standard deviation from pre to post test were (32.50, 6.12) and (42.00, 7.61) respectively. Data reveals about muscular endurance of (ATG) which shows the mean, standard deviation from pre to post test were (14.86, 4.71) and (19.30, 3.94) respectively. Muscular endurance regard to (ACTG) had shows mean, standard deviation from pre to

**Table 6.** **The analyzing data for ATG group and ACTG group is presented in the below table by the help of statistical tools i.e. mean, SD and `t' - test for selected bio-motor variables**

| Variables | Test | ATG Group N=30 | | | ACTG Group N=30 | | |
|---|---|---|---|---|---|---|---|
| | | Mean | S.D | P-value | Mean | S.D | P-value |
| Cardio-respiratory endurance | Pre | 1256.67 | 209.16 | 0.00* | 1233.33 | 217.48 | 0.00* |
| | Post | 1433.33 | 239.37 | | 1488.67 | 209.84 | |
| Muscular strength | Pre | 31.50 | 6.84 | 0.00* | 32.50 | 6.12 | 0.00* |
| | Post | 41.67 | 7.80 | | 42.00 | 7.61 | |
| Muscular endurance | Pre | 14.86 | 4.71 | 0.00* | 14.17 | 4.68 | 0.00* |
| | Post | 19.30 | 3.94 | | 19.77 | 3.47 | |
| Speed | Pre | 6.12 | 1.29 | 0.00* | 6.27 | 1.14 | 0.00* |
| | Post | 5.58 | 1.32 | | 5.18 | 0.72 | |
| Flexibility | Pre | 17.63 | 8.06 | 0.00* | 18.00 | 7.79 | 0.00* |
| | Post | 22.60 | 7.63 | | 23.90 | 6.57 | |

* Significance difference from pre to post test ($p< 0.05$)

post test were (14.17, 4.68) and (19.77, 3.47) respectively. Sprinting performance (speed, 30M) of (ATG) had shows mean, standard deviation from pre to post test were (6.12, 1.29) and (5.58, 1.32) respectively. Sprinting performance (speed, 30M) of (ACTG) had shows mean, standard deviation from pre to post test were (6.27. 1.14) and (5.18, 0.72) respectively. Participants of (ATG) regard to the flexibility performance from pre to post test with mean and standard deviation were (17.63, 8.06) and (22.60, 7.63) respectively. Subjects of (ACTG) pertaining to flexibility performance from pre to post test with mean and standard deviation were (18.00, 7.79) and (23.90, 6.57) respectively, the above analyzing data speaks about Table 6.

## 5. Discussion

The finding of this study proved that there was significant differences existed between Aerobic Training Group (ATG) and step Aerobics Training Group (ACTG). Both the groups had improved with regard to coronary heart diseases i.e. High Density Protein (HDL), Low density Protein (LDL), Total cholesterol, Blood pressure (systolic & diastolic), Percent body fat, and Lean body mass. With regard to bio-motor variables both the groups improved significantly i.e. Cardio-respiratory endurance, Muscular strength, Muscular endurance, speed and flexibility. The blood pressure of the subjects were almost normal in both the groups at the initial stage i.e. pre-test, it will be note worthy if the subjects will be selected with high blood pressure and finding out the affect of both the training protocols respectively. This is evident from this study that the individuals engage with mild aerobic activity i.e. walking for 45 minutes weekly twice for twelve weeks is also benefited. Walking is suitable for all age groups and especially for old age and obese and morbid personals. Step aerobics had shows greater performance in enhancing fitness and also reducing body fat, LDL, body weight, and improving HDL and lean body mass, which is very encouraging for the obese personals. Some participants complain of knee pain during and after the training of step aerobics. I had given suggestions to the participants for strengthening the knees with knee extensions exercises for at least three weeks before starting the step aerobics program. During the step aerobics sessions also the participants should warm up their knees with knee extensions exercises to avoid injuries and pain in the knee areas. This is evident that the aerobic cross training is more effective rather than the walking program. Further research studies can be done on morbid obese or coronary heart diseases patients to find out the significant improvement in the patients.

### 5.1 Our Study is Agreement with the Following Studies

In this study aerobic exercise in addition to the Physical education classes at school had showed significant reduction in Body Mass Index (BMI), compared with pre-test scores[23]. Effect of twelve weeks of aerobic training had shows reduction in the participants regard to their

Body Mass Index (BMI) and body weight[19]. Effect of eight week of step aerobic dance exercise program had shows significant differences in the participants' body mass index of experimental group[7]. [7] Showed that there was a significant difference in the subjects' Lean Body Mass (LBM) in the experimental group after eight weeks step aerobics dance program. [34] stated that aerobic training is the optimal mode of exercise for reducing fat mass and body mass, while a program including resistance training is needed for increasing lean mass in middle aged, over weight\obese individuals. [7] Founded that there was a significant differences in the subjects' fat percentage in the experimental group after eight week step aerobic dance exercise program. [33] investigated a study that once a week moderate intensity exercise training for continuously three months had influence on resting heart rate and decrease significantly in sedentary young man. [18] Reveals that twelve weeks aerobic exercise intervention (brisk walking) significant decrease in mean arterial pressure. [1] Investigated that the effects of a ten weeks water aerobic exercise markedly reduced the mean arterial blood pressure. In this study it was investigated on the effect of eight weeks of aerobic training increased Vo2 Max Values significantly in the experimental group compared with counterpart control group[2]. Similarly in this study it was revealed that twelve weeks aerobics training intervention with brisk walking had shows significant increase in Vo2 Max[18]. [27] In a study investigated that the jogging improves significantly with regard to cardio-respiratory endurance, strength endurance, lean body mass and reduces body fat percent among the participants.

## 6. Conclusion

Both the group's Aerobic Training Group (ATG) and step Aerobics Training Group (ACTG) shown significant improvement in all the selected coronary heart diseases variables. (ACTG) shows better performance to their counterpart (ATG) with regard to all selected coronary heart diseases variables. Both the groups show significant improvement in all the selected bio-motor variables. (ACTG) shows higher performance compare to (ATG) with regard to all selected bio-motor variables.

## 7. Acknowledgement

The Authors likes to thank the subjects and the support provided by Deanship scientific Research at King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, under Research Grant **(IN121010).**

## 8. References

1. Farahani AV, Mansournia M–A, Ziaee V. The effects of a ten week water aerobic exercise on the resting blood pressure in patients with essential hypertension. Asian J Sports Med. 2010; 1(3):159–67.
2. Askari A, Askari B, Mahdivand A, Ali Samavathi Sharief M. The effects of eight weeks aerobic training on Vo2 Max and indices in 30-45 year old non-athlete women. Iranian Journal of Health and Physical Activity. 2013; 4(1):29–37.
3. Cooper KH. The new aerobics. New York: Bintin Books; 1970. p. 87.
4. Campos AL, Sigulem DM, Moraes DE, Escrivao AM, Fisberg M. Intelligence quotient of obese children and adolescent by the Wechsler scale. Rev Saude Publica. 1996; 30(1):85–90.
5. Despres JP, Pouliot MC, Moorjani S, et al. Loss of abdominal fat and metabolic response to exercise training in obese woman. Am J physol. 1991; 261:E167.
6. Davis CL, Tomporowski PD, Boyle CA, Waller JL, Miller PH, Naglieri JA, et al . Effects of aerobic exercise on overweight children's cognitive functioning: a randomized controlled trial. Res Q Exerc Sport. 2007; 78(5):510–9.
7. Arsalan F. Effect of an eight week step aerobic dance exercise program on body composition parameters in middle age sedentary obese women. Int J Sports Med. 2011; 12(4):160–8.
8. Goldstein LB, Bushnell CD, Adams RJ, Appel LJ, Braun LT, Chaturvedi S, et al. Guidelines for the primary prevention of stroke. A guideline for healthcare professionals from the American heart association/American stroke association. Stroke. 2011 Feb; 42(2):e26.
9. Gately PJ, Cooke CB, Butterly RJ, Mackreth P, Carroll S. The effects of a children's summer camp program on weight loss with a 10 month follow-up. Int J Obese. 2000; 24:1445–52.
10. Goodpaster BH, Delany JP, Otto AD, et al. Effects of diet and physical activity interventions on weight loss and cardiometabolic risk factors in severely obese adults: a randomized trial. JAMA. 2010 Oct; 304(16):1795–802.
11. Hinkle JS, Tuckman BW, Sampson JP. The psychology, physiology, and the creativity of middle school aerobic exercises. Elementary School Guidance & Counselling. 1993; 28:133–45.
12. Hashlam DW, James WP. Obesity. Lancet. 2005; 366(9492):1197–209.
13. Kim H-K, Kim H-S, Park M-H, Kang H-S. A comparative study on cycling in relation to the physical balance, muscle strength, self-esteem and depression of elderly women. Indian Journal of Science and Technology. 2015; 8(S1):169–77.
14. Kim H, Kim H, Byun B. Predictors of pain, perceived health status, nutritional risk, social support and self-transcendence on depression among lower income senior citizens.

Indian Journal of Science and Technology. 2015; 8(S1):178–88.
15. Johson ML, Burke BS, Mayer J. Relative importance of inactivity and overweight in energy balance of obese school girls. Arm J Clni Nutr. 1956 Jan-Feb; 4(1):37–44.
16. Fegelholm M, Kukkonen-Harjula K. Does physical activity prevent weight gain: a systematic review. Obes Rev. 2000 Oct; 1(2):95–111.
17. Maffeis C. Childhood obesity: the genetic-environmental interface. Baillieres Best Pract Res Clin Endocrinol Metab. 1999 Apr; 13(1):31–46.
18. Mughal MA, Alvi IA, Akhund IA, Ansari AK. The effects of aerobic exercise training on resting blood pressure in hypertension patients. JPMA. 2001; 51:222.
19. Hosiso M, Rani S, Rekoninne S. Effect of aerobic exercise on improving health related physical fitness components of Dilla University Sedentary female community: International Journal of Scientific and Research Publications. 2013; 3(12):1–6.
20. Lee M-S, Hong J-Y. Impact factors relating to effectiveness of health information in company and public services workers of urban-rural city. Indian Journal of Science and Technology. 2015; 8(S1):9–13.
21. National Task Force on the Prevention and Treatment of Obesity. Overweight, obesity and health risk. Arch Intern Med. 2000; 160:898–904.
22. Proimos J, Sawyer S. Obesity in childhood and adolescence. Aust Fam Physician. 2000 Apr; 29(4):321–7.
23. Sofien R, Charfi N, Kamoun M, Ghroubi S, Rebai H, Elleuch H, Feki MM, Abid M. Effect of an exercise training program on body composition and aerobic capacity parameters in Tunisian obese children. Indian Journal of Endocrinology Metabolism. 2013; 17(6):1040–5.
24. Schwartz RS. The independent effects of dietary weight loss and aerobic training on high density lipoprotein and apolipoprotein A-1 concentration in obese men. Metabolism. 1987; 36:165–71.
25. Ibrahim S, Azeem K. Department of Physical Education, KFUPM; 2009. Unpublished Report.
26. Solbannavar R, Patted SV, Halkatti P, Aurora R. Clinical and angiographic correlation of chest pain with right bundle branch block. Indian Journal of Science and Technology. 2015; 8(3):208–15.
27. Suter E, Marti B, Tschopp A, Wanner HU, Wenk C, Gutzwiller F. Effect of self monitored jogging on physical fitness blood pressure and serum lipids: controlled study in sedentary middle-aged men. Int J Sports Med. 1990; 11:425–32.
28. Telama R, Yang X. Decline of physical activity from youth to young adulthood in Finland. Med Sci Sports Exerc. 2000; 32:1617–22.
29. World Health Organization. Obesity: preventing and managing the global epidemic. Publication WHO/NUT/NC.
30. Williamson DA, Perrin LA. Behavioral therapy for obesity in females. Endocrinol Metab Clin North Am. 1996 Dec; 25(4):943–54.
31. Zachwiejja JJ. Exercise as treatment for obesity. Endocrinol Metab Clin North Am. 1996 Dec; 25(4):965–88.
32. Whitaker RC, Wright JA, Pepe MS, Seidel KD. Predicting obesity in young adulthood from childhood and parental obesity. N Eng J Med. 1997; 337:869–73.
33. Wong PC, Chia MY, Tsou IY, Wansaicheong GK, Tan B, Wang JC, et al. Effects of a twelve week exercise training program on aerobic fitness, body composition, Blood lipids and C-reactive protein in adolescents with obesity. Ann Acad Med Singapore. 2008; 37:286–93.
34. Willis LH, Slentz CA, Batman LA, Shields AT, Piner LW, Bales CW, Houmard JA, Kraus WE. Effects of aerobic and\ or resistance training on body mass and fat mass in overweight or obese adults. J Appl Physiol. 2012; 113:1831–7.
35. Kim Y-S. Perception of happiness among health-related university students: Q methodological approach. Indian Journal of Science and Technology. 2015; 8(S1):161–8.
36. Fox R. Comparison of normal weight and obese girls in three sports. Circulation. 2003; 108(21):9071.
37. Harsha DW, Bray GA. Body composition and childhood obesity. Endocrinol Metab Clin North Am. 1996 Dec; 25(4):871–85.