EFFECT OF SELECTED AEROBICS EXERCISE ON CARDIOVASCULAR ENDURANCE: THE CASE OF SULULTA CHANCHO OROMIYA LEYOU ZONE ATHLETICS PROJECT; OROMIA REGIONAL STATE,ETHIOPIA.

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DEDICATION

I dedicate this thesis manuscript to my beloved parents and families.As well as the researcher extended his dedication to peoples who contribute even a piece of advice throughout in my life to reach in this stage.

STATEMENT OF THE AUTHOR

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BIOGRAPHICAL SKETCH

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ACRONYMS AND ABBEREVATIONS

ACSM	American college of Sport Medicine
ANCOVA	Analysis of Co variance
BMI	Body mass index
BMR	Basal metabolic rate
CVE	Cardiovascular Endurance
DQC	Data Quality Control
HDL	High density lipoproteins
HER	Exercise Heart Rate
LBM	Lean body mass
LDL	Low density lipoproteins System
MEED	Microsoft Encarta Encyclopedia Deluxe
PSD	Purpose Sampling Design
SCWOLZAP	Sululta Chancho Wereda Oromiya Leyou Zone Athletics Project.
SPSS	Statistical Package for Social Science
USDHHS	United States Department of Health and Human Services
%VO2 Max	Percentage of maximum Oxygen Consumption.
WHO	World Health Organization

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ABSTRACT

The primary purpose of this study was to evaluate the effects of selected types of aerobic exercise on enhancing cardiovascular endurance of students. The study was conducted to improve cardiovascular endurance performances on 30 male athletes of Suluta Chancho Oromiya Leyou Zone Athletics Project. These thirty male students were assigned as one experimental group and their age ranges 16 - 20 years. All subjects participated in selected aerobic exercises for 12 weeks i.e., three days per week and 60 minutes duration per day. Pre-test, during training test and post training test were conducted on physical fitness variables such as step test and 12 minutes run. The data collected from subjects were analyzed by paired simple t-test to determine the differences between pre-test and post-test mean value results of the participants of the study. According to the findings of the study, step test 26.6 beats per minute mean differences. In twelve minutes run 271.16 meters increments data were observed. Therefore, the results obtained from the study indicate that there were significant improvements within 12 minutes run. However, in the case of steps test, a test result was decreased because of improvement in the performance. So, the findings of the study reveals different responsible bodies like coaches, sport commission office, education office, school principals and sport Science teachers should take considerable actions for the improvement of the Athletics proficiency of the athletes as well as others youth.

Key words- Aerobic exercise, Cardiovascular endurance ,Performance and Physical fitness

1. INTRODUCTION

The introduction part of this study includes background of the study, significant of the study, objectives of the study, statement of the problem, the major research questions that have been answered after the successful completion of this study, and scope of the study are included.

1.1. Background of the Study

Fundamental movements of man, which they have achieved from their pre-human ancestors, are walking, running, jumping, climbing, throwing, pulling, pushing, etc. By permutation and combination of these basic fundamental movements, man has been developing various secondary movements essential for the day-to-day living and for the use in games and sports. Physical fitness is important for all human beings, irrespective of their age and sex. A given work may not be carried out if the required physical strength is not available. Fitness is the first and foremost thing to enjoy the life fully with effective exercises (Reddy, 2012).

Physical activity and training are important for initiating and sustaining cardiovascular health. As such, encouragement from childhood and the possibility to participate in sports activity is a major health issue which must be sustained. At the adolescence age, however, increasing expectations and competitive demands have gradually emerged as an important aspect of recreational sports in the young (Armstrong and McManus, 2010). Regular aerobic exercise will produce beneficial effects for any age group providing the exercise is specific and appropriate to the level of fitness of the individual. Progressive exercises correctly performed would increase the level of fitness and improve health. It will also create a sense of well-being, produce greater energy and reduce the risk of developing many diseases. Exercise makes demands on the body systems over and above normal every day activities and, as result, the systems adapt anatomically and physiologically. Available experience and scientific evidence show that regular physical activity provides people, both male and female, including people with disabilities with a wide range of physical, social and mental health benefits. Physical activity interacts

positively strategies to improve diet, discourage the use of tobacco alcohol and drugs, which in turn helps reduce violence, enhances functional capacity and promotes social interaction and integration.

within among peoples (WHO, 2003). Aerobic exercise stimulates heart, lungs and all working group of muscles and produces valuable changes in body and mind. Many physiological changes are determined by daily aerobic exercises (Shanna *al.*, 2010). Many of the researchers sighted in the above, have studied that physical exercises are important for the development of all physical fitness. Nevertheless, limited researches were done in the area of how much aerobic exercises are effective for the improvement of cardiovascular endurance. Hence, this study is going to examine effective aerobic exercises for the improvement of cardiovascular endurance of athlete students at Sululta zone athletics project (SCWLZAP). As Shemelis (2010) studies, Aerobic activities should be used to develop cardie-respiratory endurance. Basically, aerobic activities are those in which a sufficient amount of oxygen is available to meet the body's demands. Popular aerobic activities including running, walking, rowing, swimming, cycling, aerobic dancing, jogging, tread mill and somewhat continuous in nature the intensity of work load can be easily regulated by controlling the pace for the performance of elevated level for an extended period.

Nowadays, ineffective aerobic exercises training for the developments of cardiovascular endurance seen as a gap for this study in our country in general and in this study area in particular and, therefore, effective selected aerobic exercises were used as causes for the improvement of cardiovascular endurance of male athlete project SCWOLZAP.

1.2. Statement of the Problem

Regular physical activity, fitness, and exercise are critically important for health and well being of all people, whether they participate in vigorous exercise or some type of moderate health-enhancing physical activities. Even among frail and very old adults, mobility and functioning can be improved by way of physical activity (Butler *et al.,* 1998).

According to ACSM (2000), physical activity is defined as bodily movement produced by the contraction of striated muscle that substantially increases energy expenditure. This definition includes exercise, which is planned, structured, and repetitive physical activity aimed at improving maintaining physical fitness, organized sports or games (football, basketball), transport (walking, cycling), occupational physical activity(manual labor, household chores) and

non-organized, recreational physical activities (Okely, Patterson &Booth et, 1998; ACSM, 2000). Furthermore, these days, physical exercise is a non-pharmacological treatment of modern and busy lifestyle around the world. Although, many studies believe that regular physical activity can have immediate health benefits by positively affecting body composition and musculo skeletal development for male and female.

But the reality in our country as well as at SCWLZAP shows the value of exercise has been known theoretically not practically. So this, it need academicians‟ investigation of effective type of aerobic exercise for the development of cardiovascular endurance. Hence, in this study area there were rare applications of walking, jogging and rope jumping aerobic exercise for the development of cardiovascular endurance. The merely application of the above aerobic exercises catch the attention of researcher to conduct current study for the development of cardiovascular.

From the above statement of the problem, the researcher attempted to answer the following questions with the conceptual idea of:-

1. What significant changes should be seen on the cardiovascular endurance of athletes in Sululta Chancho Woreda Leyou Zone Athletic Project?

2. What are the main elements of important aerobic exercises for the improvement of cardiovascular endurance of at Sululta Chncho Wereda Leyou Zone Athletics Project/?

3. What would best results of cardiovascular endurance and status of SCWLZAP male Athletes achieved after selected aerobic exercises has conducted?

1.3. Scope of the Study

This study was applied at Sululta Chancho Wereda Leyou Zone Athletics Project.It has employed on aerobic exercise which can improve cardiovascular endurance performance of the male athletes at the age of 16 -20

1.4. Significance of the Study

The significance of this study helped us to identify the effects of aerobic exercise in improving cardiovascular endurance performance of athletes at SCWLZAP. The outcome of the study has reduced the problems that occurred at SCWLZAP select in relation to their abilities to cardiovascular endurance performance. But that does not mean the outcome of this research is limited to the area under study. Moreover, it has helped us to know the type of training for aerobic exercise given to trainees in order to improve aerobic capacity in cardiovascular endurance abilities of the athletes. One of significance of the study helps to create awareness about the positive and negative impacts of aerobic exercises. After the findings of the problems the researcher will be recommend responsible stake holders of the study. Finally, the study has served as stepping stone for further study on the same topic.

1.6. Objectives of the Study

1.6.1. General objective

The general objective of this study was to examine the effects of selected aerobics exercise improving cardiovascular endurance performance of athletics project.

1.6.2. Specific objectives

The study has the following specific objectives;

1. To investigate the significant change of cardiovascular endurance performance of athlete at Sululta chancho wereda leyou zone.

2. To identify effective aerobic exercises for the improvement of cardiovascular endurance on selected Sululta Chancho Wereda Leyou Zone.

3. To identify how selected aerobic exercises influences cardiovascular endurance performance of selected Sululta Chancho Wereda Leyou Zone.

4. To examine the effects of aerobic in selected exercise in proving cardiovascular endurance the athletes in Sululta Chancho Wereda Leyou Zone Athletics project training.

1.7. Limitation of the Study

The outcome of this study was very interesting to conduct the study on selected aerobic exercise on the cardiovascular endurance performance of athlete however; study was limited to Sululta Chancho Oromiya Leyou Zone Athletics Project site because of the shortage of time and budget.

The experimental research was complex and considering usually as private domain. As a result data collection materials and manpower was very difficult to carry out the study.

2 .RELATED LITERATURE REVIEW

2.1. Components of Physical Fitness

Physical fitness is a set of attributes that people have or achieve. Being physically fit has been defined as the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergence s (Gutin, 1980). Fitness is defined as a condition in which an individual has enough energy to avoid fatigue and enjoy life. Physical fitness is divided into five health related (muscular strength, muscular endurance, flexibility, cardiovascular endurance and body composition) and six skill related (agility, balance, coordination, speed, and power and reaction time) components. Skill related fitness components are fitness types which enhances one's performance in athletic or sports settings. Health-related fitness is the ability to become and stay physically healthy. This component focus on factors that promote optimum health and prevent the onset of disease and problems associated with inactivity (NASPE, 2009).

2.2. Cardiovascular Endurance

The efficiency with which the body delivers oxygen and nutrients needed for muscular activity and transports waste products from the cells. Cardiovascular endurance, sometimes called cardio respiratory fitness, aerobic fitness, or aerobic capacity, is one of the basic components of physical fitness. Cardio respiratory fitness is a condition in which the body's cardiovascular (circulatory) and respiratory systems function together, especially during exercise or work, to ensure that adequate oxygen is supplied to the working muscles to produce energy. Cardio respiratory fitness is needed for prolonged, rhythmic use of the body's large muscle groups. A high level of cardio respiratory fitness permits continuous physical activity without a decline in performance and allows for rapid recovery following fatiguing physical activity (Corbin *et al*., 2003). Cardiovascular endurance is considered as the most important aspect of health-related fitness due to its importance in decreasing risk of heart disease, and promotion of optimum performance. Other names given to cardiovascular endurance are cardio respiratory fitness, cardio-respiratory endurance, cardiovascular fitness or aerobic fitness. The name cardio-

respiratory fitness is given because it requires the delivery and utilization of oxygen, which is only possible if the circulatory and respiratory systems are capable to perform these functions (USDHHS, 1996).The term “aerobic fitness” has been in use, because aerobic capacity is considered to be the best indicator of cardio-vascular fitness, and aerobic physical activities are the only means to achieve it (Corbin *et al*. 2003). Also, referred Cardio-vascular endurance as cardio respiratory endurance since it is an ability to exercise vigorously in extended periods of time without too much fatigue (Wuest and Lombardo, 1994).

Cardio-respiratory endurance is depends on the ability of the lungs to deliver oxygen from the environment to the bloodstream, the hearts capacity to pump blood, ability of the nervous system and blood vessels to regulate blood flow, the muscles capacity to generate power and capability of the body’s chemical systems to use oxygen and process fuels for exercise (Insel et *al*., 2001).They have made it clear that improved cardio-respiratory fitness helps the heart to function efficiently, resting heart rate slows down, blood volumes increase, improved blood supply to tissues, blood pressure at rest decreases, bio-chemical function in muscle and liver are improved, increase in the ability of the body to use energy supplied by food and to do more exercise with less effort from the oxygen transport system.

A good Cardiovascular fitness requires a fit heart muscle, fit vascular system, fit respiratory system, fit blood with adequate hemoglobin in the red blood cells and fit muscle tissue capable of using oxygen. These reduce risk of heart disease, other hypo kinetic conditions and early death. It is now known that appropriate physical activity can build cardiovascular fitness in all types of people and those with excess body fatness. Good cardiovascular fitness enhances the ability to perform various tasks, improves the ability to function and is associated with a feeling of well-being. Cardiovascular fitness and endurance could be developed through performance of active aerobic activities such as brisk walking, jogging, aerobic dancing, cycling, and tennis, playing football, swimming and many others. Hence, for optimal level of development, activities should be done daily, at least, not less than three times a week (Newport, 2001).

In contrary to the above authors, Walt (2003) claimed, it should be noted that vigorous physical activities have the potentials to increase the risk of orthopedic injury if done too frequently. In view of this, most experts recommend, at least, one day a week off. The recommended duration of physical activities capable of building cardiovascular fitness is 20-60 minutes of active aerobic activity. Activity could be either intermittent or continuous if the amount of exercise is the same, and last at least 10 minutes.

2.2.1. Aerobic fitness

Aerobic fitness is a measure of the combined efficiency of the lungs, heart, blood stream and exercising muscles in getting the oxygen to muscles and putting them to work. A larger aerobic capacity increases the body's efficiency to perform daily activities (Stephens *et al.,* 2003).

Aerobic endurance is the highest proportion of VO2max at which an individual can sustain >20 minutes‟ activity. It closely allied to the lactate thresholds point at which muscular fatigue begins to be hastened. Elite endurance athletes can sustain activity typically at greater than 80% of their aerobic power, whereas sedentary or diseased individuals may only be able to sustain activity at 40–50% of aerobic power. This means the inactive or diseased person not only has a reduced capacity but also cannot utilize as much of whatever capacity they possess compared with the more active or fitter individual. Aerobic power, typically described as VO2max. It is the maximal amount of oxygen the body can take in and utilize during physical activity. These are influenced by three factors: the lungs‟ ability to oxygenate the blood, the cardiovascular system's ability to deliver the oxygenated blood to the exercising muscles and the muscles‟ ability to extract and utilize the oxygen to produce energy for sustained contractions (Buckley and Hughes, 2008).

Commonly used assessments are the following**:**

• The 1-mile walk test**.** This estimates level of cardio respiratory fitness (maximal oxygen Three consumption) based on the amount of time it takes you to complete 1 mile of brisk walking and heart rate at the end of walk. A fast time and a low heart rate indicate a high level of cardio respiratory endurance.

• The 3-minute step test**.** The rate at which the pulse returns to normal after exercise is also a good measure of cardio respiratory endurance; heart rate remains lower and recovers faster in people who are more physically fit. For the step test, step continually at a steady rate and then monitor heart rate during recovery.

• The 1.5-mile run-walk test. Oxygen consumption increases with speed in distance running, so a fast time on this test indicates high maximal oxygen consumption. (McArdle, W. D., F. I. Katch, and V. L. Katch. 2000Aerobics Exercises to Improve Cardio respiratory endurance and reduction of weight step aerobics for weight loss comes with many benefits to health including helping to burn belly fat while exercising and building cardiovascular fitness needed to move on to more advanced forms of aerobic exercise. When trying to burn belly fat combining aerobic step exercise with favorite workout makes a great circuit training routine. Step aerobics sometimes referred to as step aerobic exercise is an aerobic exercise that uses an elevated surface most likely a stepping surface to perform aerobic moves helping work on cardio fitness. (http://slism.com/diet/step-aerobics-weight-loss.html)

2.2.2. Cardio respiratory capacity

The cardio-respiratory component of fitness reflects the integrity of the heart and lungs as well as the ability of the muscle cells to use oxygen as fuel. It therefore reflects the degree to which an individual can increase metabolism above resting levels. Incremental tests up to maximal oxygen uptake (VO2max) are used to measure this component and to define the limits of physical work capacity. This measurement is considered to be the best single measure of an individual's overall functional capacity and ability to react to acute physical and mental stress. For healthy individuals, higher cardiovascular endurance also indicates an elevated level of physical fitness. (Corbett, 2009)

2.3. Aerobic Exercise

In this section effects of aerobic exercise training on cardiovascular performance components, effect of training on physiological variables and intense exercise variables for comparing of athletics trainer are discussed. Aerobic exercise is a physical exercise of relatively low intensity that depends primarily on the aerobic energy-generating process.

Aerobic means “with oxygen”, and refers to the use of oxygen to adequately meet energy demands during exercise via aerobic metabolism. Generally light to moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods of time and it refers to exercise that requires the consumption of substantially more oxygen than at rest and can be undertaken for a prolonged duration without excessive fatigue. (Http://www.newels.co and also, Microsoft Encarta Encyclopedia Deluxe (MEED) (2003) classified Exercise into aerobic and anaerobic exercise. Aerobic exercise, which uses oxygen to keep large muscle groups moving continuously at intensity that, can be maintained for at least 20 minutes. Aerobic exercise uses several major muscle groups throughout the body, resulting in greater demands on the cardiovascular and respiratory systems to supply oxygen to the working muscles. Aerobic exercise includes swimming, running, cycling, walking, jogging, and rope jumping and etc. are the form recommended for reducing the risk of heart disease and increasing endurance MEED (2003).Thus, aerobic activity generally has a low to moderate-intensity and long duration. Aerobic exercise includes lower intensity activities performed for longer period of time activities such as walking, running swimming and require great deal of oxygen to generate the energy needed for prolonged exercise (building the solider, athlete, injury, preventing and performance optimization (Hoffet al, 2oo2). Regular aerobic training induces significant adaptation both at rest and during exercise in variety of dimensional and functional capacities related to the cardiovascular and respiratory regular system (Shana b Mohammad Abdel el-k ader, 2010).

2.3.1. Benefit of aerobic exercise

Downstream from the heart are your muscles, which get more efficient at consuming oxygen when you do regular aerobic exercise (remember, "Consuming" oxygen means that the muscles are taking the oxygen out of the blood).. Greater stroke volume means the heart doesn't have to pump as fast to meet the demands of exercise. Fewer beats and more stroke volume mean greater efficiency. Mitochondria inside the muscle increase in number and activity. Mitochondria are the powerhouses of your cells. They do all the heavy-duty work to keep you moving.

2.3.2. Effect of aerobic exercise on cardiovascular endurance

Cardiovascular endurance (CVE) is one of the most important measures of overall health. A persons level of (CVE) helps to prevent disease, quality of life and ability to react to acute physical and mental stress for healthy individual, higher CVE also indicates an elevated level of physical fitness (Eric, 2009). Aerobic exercise use large muscle groups to increase heart rate. This cause faster breathing which maximizes the oxygen and nutrient in the blood cells .During maximum aerobic exercise, trained individuals has increased maximum oxygen. Consumption and is better able to process oxygen and fuel can provide more energy to working muscles. Aerobic capacity is the most widely accepted single indicator of one`s cardio respiratory fitness level and it is one of the best types of activity for training and maintaining all percentage of body fat (Probar fet.al.1991).

2.3.3. Aerobic Exercise Facts

- Aerobic exercise is sometimes known as "Cardio" exercise that requires pumping of oxygenated blood by the heart to deliver oxygen to working muscles.
- Aerobic exercise stimulates the heart rate and breathing rate to increase in a way that can be sustained for the exercise session. In contrast, anaerobic ("without oxygen") exercise is activity that causes you to be quickly out of breath, like sprinting or lifting a heavy weight.
- Examples of aerobic exercises include cardio machines, spinning, running, and swimming, walking, hiking, aerobic classes, dancing, cross-country skiing, and kickboxing. There are many other types.
- Aerobic exercises can become anaerobic exercises if performed at a level of intensity that is too high. Greater stroke volume means the heart doesn't have to pump as fast to meet the demands of exercise. Fewer beats and more stroke volume mean greater efficiency.
- Aerobic exercise not only improves fitness; it also has known benefits for both physical and emotional health.
- Aerobic exercise can help prevent or reduce the chance of developing some cancers, diabetes, depression, cardiovascular disease, and osteoporosis.

- An aerobic exercise plan should be simple, practical, and realistic. Specific equipment (such as cardio machines) may be used but is not necessary for successful aerobic exercise.

2.4. Selvam Studies on Aerobic Exercise

The research conducted a study on selected effect of aerobic exercise on selected physiological variables among college girls (Sudan, 2008). For this study aerobic exercise uses large muscle groups rhythmically and continuously and elevates the heart rate and breathing for a sustained period. Common examples include walking, jogging/running, swimming, rowing, stair climbing, bicycling, cross country skiing, step and dance exercise classes, roller skating, and the more continuous forms of tennis, racquet ball and squash. To achieve this purpose, 60 girls were selected from TheivannaiAmmal College for women, Villupuram. The age group of the subjects ranged between 17 to 20 years. The selected subjects were divided into two groups. The groups 7 first trained for aerobic exercise. The training group underwent the training for 5 days in a week for eight weeks and group second acted as control group to make adjustments for differences in the initial means and test the adjusted posttest means for significant differences. The researcher used analysis of covariance (ANCOVA) for interpreting the results. The results for the study revealed that aerobic exercise had a significant effect in the improvement of the physiological variables such as resting pulse rate, breath holding time, vital capacity and respiratory rate.

Working in IT companies for the purpose of the study. For this study, the obese women were grouped into three namely, control, floor aerobic and step aerobics group. The collected data on the cardio respiratory parameters prior to and after 12 weeks of varied aerobics training were statistically analyzed using analysis of covariance (ANCOVA) as Selvalakshmi, (2007) conducted a study on the effect of varied aerobic training programs on obese women recommended by Clarke, (1972) and result on vital capacity showed significant improvement due to varied aerobic exercises, as where no significant improvement was found in resting heart rate.

In Mugale, Turkey conducted the study on the effect of twelve week aerobic exercise programmers on health related physical fitness components and blood lipids in obese girl's (Ozcan and Ozturk, 2011).The aim of the study will be to investigate the effects of 12 week aerobic exercise program on health related fitness components and blood lipids in obese girls. In this study, a total of 40 girls were recruited as exercise group (n = 20) and control group (n = 19). Participants joined sessions for 60 min per day, 3 days per week for 12-week. There were significant differences in weight, body mass index (BMI), flexibility, sit-ups, hand grip for both hands , skin fold measurements (thigh, triceps, biceps, abdomen, super ilia c, sub scapula, chest, body fat percent, heart rate, high density lipoproteins (HDL), low density lipoproteins (LDL), total cholesterol, and triglyceride between pre-test and post test scores in the exercise group ($p<0.05$). It was concluded that regular aerobic exercise may affect health related fitness components and blood lipids positively in girls. Furthermore, it may result in decreasing obesity in girls. Mills and Mae (1994) conducted a study on the effect of low intensity aerobic exercise on muscle strength, flexibility and change of balance among sedentary elderly person .The purpose of this study was to determine the effects of a low intensity aerobic exercise program on muscle strength and flexibility of the lower extremities and balance among sedentary elderly persons. This pre and posttest quasi-experimental study consisted of 47 sedentary elderly subjects not engaged in regular exercise and living in metropolitan housing in southwestern Ohio. Convenience sampling was used with two apartment complexes randomly assigned to the experimental or comparison groups To prevent diffusion of treatment, subjects were assigned to these groups depending on their place of residence The 20 experimental subjects, with a mean age of 75.3, participated in eight weeks with low intensity of aerobic exercise while the comparison group (n=20), with a mean age of 74.8, maintained their usual level of activity for eight weeks. Experimental subjects also did the exercise on their own between classes. The exercise group had significantly greater flexibility of the ankles and knee than the comparison group. No significant differences were found between the groups for muscle strength. Although balance and perception of balance were not significantly different between the groups, the experimental group improved their balance by 22.4% from pretest.

The research conducted the study on the effects of an eight-week step-aerobic dance exercise program on body composition parameters in middle-aged sedentary obese women in AksarayTurkey(Arslan, 2011). This study comprised an eight-week randomized controlled trial. For this study a total of 49 healthy sedentary obese women participated voluntarily. They were randomly divided into two groups: those undertaking a step-aerobic dance exercise program (n=29) and a control group (n=20). The subjects took part in a step-aerobic dance exercise program for one hour per day, three days a week for eight weeks. The subjects‟ Body Mass Index (BMI), weight, waist circumference, waist-hip ratio, four-site skin fold thickness, fat percentage, basal metabolic rate and lean body mass were assessed before and after the completion of the step-aerobic dance exercise program. After the eight weeks of the step-aerobic dance exercise program, significant differences were found in the subjects‟ weight, BMI, body composition parameters, waist-hip ratio (WHR), waist circumference (WC), fat percentage, lean body mass (LBM) and basal metabolic rate (BMR) in the experimental group ($p<0.05$). There were no significant differences in the control group after the experiment in terms of the same measures ($P>0.05$) .The result of this study concluded that the step aerobic dance program proved to be a useful exercise modality for weight loss and in terms of body composition. There was a clear response to the eight-week step aerobic dance program in terms of central obesity in sedentary obese Turkish women. Some of the common types of aerobic exercise Walking: is one of the simplest and most available aerobic exercises. You can vary the intensity to match your fitness level. Other than walking shoes, it does not require any special equipment. You can walk almost anywhere: outdoors or indoors (malls, indoor tracks, or a treadmill). This makes walking easy to continue throughout the year. Walking is a good choice for starting their first exercise program or finds other exercises too hard on their joints. Some of the ways a walking habit can improve your health: Better cardiovascular fitness, stronger leg muscles, Lower blood pressure, Lower risk of heart disease, diabetes, bowel cancer and osteoporosis. It’s also a safe, low-impact exercise that most people can do and it’s especially good if you’re overweight, unused to physical activity or pregnant.

Walking for 30 minutes a day at moderate intensity is great. Walking for a longer period of time is better still. As you get fitter, you will be able to walk more briskly. Walking up

and down hills will also help to boost stamina and leg strength. You'll get even more benefits from a walk if you swing your arms as this helps you walk faster and can burn 5 to 10 percent more kilo joules.

Cycling:-is another type of aerobic exercise with wide appeal and value. You can use a stationary or regular bike. Cycling may be ideal for individuals who, due to arthritic or other orthopedic problems, are unable to walk for an extended period of time without pain or difficulty. A program that combines walking and cycling may provide cardiovascular benefits without inducing the limiting pain as quickly. Cycling is also a good choice for people who are greater than 50 pounds overweight. It helps the heart without the mechanical stress on the back, hips, knees and ankles that walking can cause. One drawback - if you cycle outdoors, exclusively, the weather may limit your activity.

Ski Machines, Stair Climbers, Stepper, and Elliptical:-These types of machines can provide a good aerobic workout and each has its own unique strengths and drawbacks. First, exercise on these machines may be too strenuous to be enjoyable and provide optimal benefit for the beginner or person of low fitness level, even at the lowest settings. To determine if this type of machine is within your capability, give the machine of your choice a trial run at the store or fitness center. You should be able to pass the "talk test" while exercising at a moderate pace. People with knee or hip problems should avoid stair climbers and steppers as these machines can put extra stress on these joints. Ski machines require above-average coordination to master. The advantage to the machines is that they are indoor activities that can be pursued regardless of the weather.

Swimming: is an excellent aerobic exercise, but considerations should be made before starting a program. For the exercise beginner, low-fit, or non-swimmer it might be a difficult activity to maintain the appropriate intensity for the recommended 30 to 60 minutes. Also, because the focus of swimming is on the smaller upper body musculature and swimming is a less efficient activity than cycling or walking, one can easily exceed their target heart rate range with swimming. Therefore, those with heart conditions should address a swimming program with their physician before starting. Water aerobics and water walking are good alternatives for those with joint pain. The buoyancy provided by the water eases stress on the joints.

Jogging, Aerobic Dance: These can be safe and beneficial exercise for the highly fit person. Both can be done indoors, which makes them year-round activities. Anyone with orthopedic problems or who experiences symptoms such as chest pain or shortness of breath should not engage in these activities. Remember to check with your doctor or cardiac rehabilitation instructor before starting any exercise program.

There's more than one way to improve cardiovascular fitness with aerobic or „cardio" exercise that raises your heart rate. The best activity for you and one you're likely to stick with is one you enjoy and that fits easily into your life.

Running: Like walking, running is an inexpensive exercise you can do anywhere at a time that suits you. It is beneficial in helping to improve heart and bone health. Its advantage over walking is that it improves heart fitness and burns kilo joules at a greater rate. It takes roughly an hour for a walker to burn the same number of kilo joules that a runner burns in 30 minutes.

Jogging:-is running at a slower pace which is still a great aerobic exercise. Like walking, running or jogging can be a social activity you can do with a friend or in a group. Many areas have running clubs which welcome runners of all skill levels, University of California B Serkeley Foundations of Wellness. A dozen ways to improve you're walking workouts. (http://www.wellnessletter.com)

2.5. Assessing Cardio Respiratory Fitness

heart rate each time the heart beats, it pumps blood into arteries; this surge of blood Monitoring causes a pulse that can feel by holding fingers against an artery. Counting pulse to determine exercise heart rate is a key part of most assessment tests for maximal oxygen consumption. Heart rte can also be used to monitor exercise intensity during a workout. The two most common sites for monitoring heart rate are the carotid artery in the neck and the radial artery in the wrist. To take pulse, press index and middle fingers gently on the correct site. Shift position several times to find the best place to feel pulse. (JuulAchten and Asker E. Jeukendrup 2003,)

2.6. Measurement of Exercise Intensity

There are varying ways to measure your exercise intensity to make sure your body is getting the most out of every workout. You may need to experiment to find out which method of measuring exercise intensity suits you best. Three different measurement methods include: - Target heart rate, Talk test, and Exertion rating scale (http://www.better health, 2013).

2.6.1. Heart rate

A cardio regulatory center in the medulla obligato of the brain can alter the heart rate by way of the autonomic nervous system. Parasympathetic motor impulses conducted by the vagus nerve cause the heart rate to slow, and sympathetic motor impulses conducted by sympathetic motor fibers cause the heart rate to increase. The cardio regulatory center receives sensory input from receptors within the cardiovascular system.

The cardio regulatory center is under the influence of the cerebrum and the hypothalamus. Therefore, when we feel anxious, the sympathetic motor nerves are activated, and the adrenal medulla releases the hormones nor epinephrine and epinephrine. The result is an increase in heartbeat rate. On the other hand, activities such as yoga and meditation lead to activation of the vague nerve, which slows the heartbeat rate. Other factors affect the heartbeat rate as well. For example, a low body temperature slows the rate. Also, the proper electrolyte concentrations are needed to keep the heart rate regular (Vander, 2001).

Target heart rate (THR*):* The human body has an in-built system to measure your exercise intensity – your heart. Your heart rate will increase in proportion to the intensity of your exercise. You can track and guide your exercise intensity by calculating your Target Heart Rate (THR) range (http://www.better health, 2013). For low to high - intensity physical activity, a person's Target Heart Rate should be 40 to 85% of his or her maximum heart rate (ACSM, 1995). This maximum rate is based on a person's age. An estimate of a person's maximum heart rate can be calculated as 220 beats per minute (bam) minus your age. Because it is an estimate, use it with caution-Take your pulse again when you have been exercising for about 5-10 minutes. Continue taking your pulse

at regular intervals. A heart rate monitor is an easy way to keep track of your heart rate whiles you where exercising or you can take your pulse.

2.7. Characteristics of Exercise Intensity

Exercise intensity refers to how hard your body is working during physical activity. Your health and fitness goals, as well as your current level of fitness, will determine your ideal exercise intensity. The goal is work hard, but not too hard. Typically, exercise intensity is described as low, moderate, or vigorous. For maximum health benefits, the goal is to work hard, but not too hard, described as moderate-intensity by the (National Physical Activity Guidelines for Australians). These guidelines recommend that for good health, you should aim for at least 30 minutes of moderate-intensity physical activity on most days. This is the same for women and men (http://www.better health, 2013). The process of determining and controlling appropriate exercise intensity presents a challenge, which has implications related to both physiological changes and to individual compliance within an exercise program (K and EPLM 2001). Several measurements for gauging exercise intensity for various exercise moralities have been devised and applied. These include proportion of maximal oxygen uptake (%V*O*2 max), proportion of maximal heart rate (%HR max), proportion of maximal heart rate reserve (%HRRsmax), and blood lactate indices. The following will cover the main principles of predicting and controlling exercise intensity by extrapolation from the relationships between oxygen uptakes, heart rate, and power output and running speed. Ideally, proportions of the *O*2 max are used to specify exercise intensity levels. The recommended intensity range is normally between 40% and 85% depending on the health and training status of the individual (ACSM, 1995).

Low- intensity-The decrease in the minimal intensity to 40% of VO2max and 55% of HRmax represents a change in the ACSM recommendation and more clearly recognizes that the Minimal threshold for improving fitness/health is quite variable at the lower end of the intensity scale. For low-intensity sub maximal exercise, fatigue may result from substrate depletion, dehydration, hyperthermia, or loss of motivation associated with central fatigue *(Newsholme et al., 1992).*

Moderate-intensity-activity in this statement referred to activities that use Approximately 150 kilo calories (630 kJ) per day or are equivalent to 55-65% of VO2max. The statement also highlights that many health benefits may be accrued by accumulating short bouts of activity throughout the daytime. This recommendation should be seen as the minimal recommendation for health benefit as not all diseases respond to moderate-intensity activity. Indeed, the Surgeon General of the United States later updated the recommendation to state that: „Additional health benefits can be gained through greater amounts of physical activity. People who can maintain a regular regimen of activity that is of longer duration or of more vigorous intensity are likely to derive greater benefit" (Montoye.H, 1996).

2.8. Warm-Up and Cool Down

A proper warm-up raises body temperature and is often recommended to prevent injury and muscle soreness. Although a warm-up has not been conclusively proven to decrease the incidence of injury, some evidence is consistent with this theory. A higher temperature decreases the viscosity of the joint capsule and increases the speed of muscle contraction and relaxation and enzymatic reactions (Enoka, 1988). General and specific warm-ups for resistance training are recommended for weight lifting and is kinetic

exercises (Perrin, 1993). A general warm-up involves the major muscles of the body; it is similar to the warm-up used for aerobic exercise and includes activities such as jumping rope or jogging. Specific warm-up activities for weight training involve performing the same lifts that are part of the normal program but at a weight well below the training level. The duration and the intensity of the warm-up should be suited to the individual and the task to be performed. A proper warm-up should cause a rise in core body temperature of 0.5 1.0°C but should not be so strenuous that it causes fatigue. Generally, a warm-up is considered adequate when the individual begins to sweat.

3. MATERIALS AND METHODS

This chapter deals with experimental site, target population, sampling techniques and sample size, study design, experimental materials, sources of data, methods and procedures of data collection, inclusion and exclusion criteria, methods of data analysis, data quality control and protocol and ethical consideration of the study participants of research was explained as follows.

3.1. Description of the Study Area

Sululta *Woreda* is one of the six *Woredas* of Oromiya Special Zone Surrounding Finfinne. It is located about 40kms north of Addis Ababa. Sululta Woreda is bordered by Wachale and Yaya Gulalle Woreda in the North, Addis Ababa City Administration and Welmera *Woreda* in the South, Jidda and Barrak Woreda in the East and Mulo Woreda in the West. Kenenisa Camp (Kenenisa Sports Resort), a high-altitude athletics training camp built by Olympian Kenenisa Bekele, is located in Sululta. This *woreda* is characterized by the Sululta plain, which is a wide, shallow valley with an elevation of 2500 meters above sea level, almost completely surrounded by mountains with numerous small rivers which drain into the Muger.

3.2. Target Population of the Study

The study was focused at SCWLZAP. The researcher used 30 Male athletes as total target at the age of 16-20 years.

3.3. Sampling Techniques and Sample Size

To this specific study the researcher was followed purposive sampling technique. In this research instances, the researcher preferred to used small number of participants on the basis of participant knowledge, its elements and purpose of the study may be members of subjects are easily identify from its larger population (Babble, 2007).

The selection of population (target group) depends on their, age, health status and on their interest to participate in aerobic exercises training for the improvement of cardiovascular endurance performance for maximizing technical or tactical skills for athletics ability.

The sample size of this study was 30 athletes between the ages of 16 -20 years within among at SCWLZAP through purposive selection.

3.4. Design of the Study

In this study, the researcher employs a single experimental group by standard norms. There was no a control group in this study. A single experimental group used for providing pre-test and post-test in order to identify the effect of selected aerobic exercises on improvement of cardiovascular endurance. The training schedule was given in a three-month time (October, November and December in(2019)for training sessions in which 60 minutes per each session.

3.5. Experimental Materials

The researcher used SCWLAPS football ground for field tests other than conducting the training program of the study subjects. The materials was stop watch, measuring tape, whistle, mats, marking cones, rope, pen, and score recording sheet.

3.6. Source of Data

The primary data was collected from the subjects of experimental study group through pre, during and post tests on effects of select aerobic exercises on cardiovascular endurance.

3.7. Methods and Procedure of Data Collection

Test 1: 12 minutes run/walk for measuring cardiovascular endurance.

To undertake this test the researcher used:

Track or area with consistent intervals set up to ensure proper distance to be recorded

400 meter track

Stopwatch

Whistle

Assistant

Pencil/paper

Procedures (how to conduct the test)

This test requires that the athlete should run a distance that he can for only 12 minute

The athlete warms up for 10 minutes the assistant gives the command "GO", starts the stopwatch and the athlete commences the test. The assistant keeps the athlete informed of the remaining time at the end of each lap (400m). The assistant blows the whistle when the 12 minutes has elapse and records the distance the athlete cover.

Test 2: step up/3 minute step test to measure cardiovascular endurance

To undertake this test the researcher used:

12-inchtall step, bench, or box (as close to 12 inches as you can find), Stopwatch, timer, or clock with a secondhand, Heart rate monitor (optional) and Partner to assist with cadence and form (optional)

Procedures:

1. Stand facing your step.

2. When ready to begin start the stopwatch or timer and begin stepping on and off the step to the metronome beat following a cadence of up, up, down, down.

3. Continue for 3 minutes.

4. As soon as you reach 3 minutes, stop immediately and sit down on your step.

5. Perform a manual pulse reading and count the number of beats for an entire 60 seconds (see: http://www.webmd.com/heart/taking-a-pulse-heart-rate - If wearing a heart rate monitor record your heart rate 1 minute from when you sit down.

6. Record your pulse when you have reached 1 minute result.

The data record by the researcher with the help of one researcher assistant.

3.8. Inclusion and Exclusion Criteria

Subjects who fulfill a questionnaire for history of healthy status and whose age were 16 and 20 years old included in this study. In addition, the subjects who have any recent physical injury and medical condition not participate in this study.

3.9. Methods of Data Analyze

The researcher was gathered the data from parameters of cardiovascular endurance tests. The gathered data was analyzed, interpreted and tabulated into meaning full idea using descriptive statistical form. Then, the data was coded and organized for analysis. After that, the coded or organized idea was interpreted by using statistical package software (SPSS) version 20.0 and T-test was used to summarize the change between PT and PoT in aerobic exercise on improving the effect of cardiovascular endurance of Athletes.

3.10. Data Quality Control (DQC)

To ensure quality of the data of cardiovascular endurance, the selects and standardize aerobic exercises were use. To minimize the mistakes that may occur during data collection; and to collect the appropriate endurance test, like 12 minute run and step test, assistant recorder of data was trainee among physical education teachers at the school under study.

3.11. Protocol and Ethical Consideration

This study was designed in such a way that ethical issues have properly addressee. Privacy of the subjects and confidentiality was strictly observed and maintainers throughout the study. The study was conducted under the project and code of conduct in governing research activities and ethical issues. The written consent was given inform the concerned bodies.

4. RESULTS AND DISCUSSIONS

4.1 Overview

This chapter dealt with the analysis of data collected from the samples under this study. The purpose of the study was to examine the effects of Aerobic exercises in improving cardiovascular endurance performance of selected Athletes in Sululta Chancho Oromiya Leyou Zone male athletics project . To achieve the purpose of the study 30 male athlete from Sululta Chancho Athletics Project were selected as subjects and their age was 16-20 years. They were assigned in one group and the selected exercises were given for 12 weeks. The variables which were selected for this study were Step test and 12 minutes run. In addition to this (resting heart rate and exercise heart rate) were measured. Pre, during and post tests were conducted for all 30 study subjects and the test results were recorded. The collected data were analyzed by paired sample t-test using SPSS version twenty (V.20). The results for each variable were discussed below.

4.2. Mean and SD Values of Step Test Performance

Table 1. Mean and Standard deviation of PT, DT and PoT of step test results

Variable	N	PT	DTT	PoT
ST	30	**148.20±9.106**	**137.00±9.214**	**120.00±24.325**

Values are in the form of mean + SD = standard deviation, PT, = pre training test, DTT= during training test, PoT= post training test, ST = step test and graphically presented as shown below.

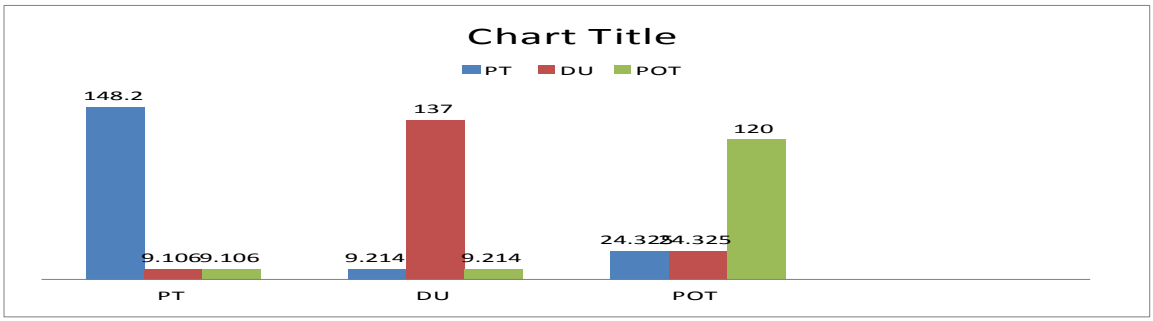

Figure 1: Mean comparison among pre, during and post step test results of the study subject

Quasi Experimental Group Pre Test, During Test, Post Test.

The above table 2 and figure 1 showed that there was significant change in pre-post test results. The improvement was seen on step test mean differences values due to the twelve weeks aerobic exercise training, in which the subjects were engaged in. The mean value for step test before training was 148.20 ± 9.106 beats/minutes, during training test results was 137.00 ± 9.214 beats per minutes and post training results mean value of step test was 120.00 ± 8.05 beats/minutes after twelve weeks training program. The mean differences value was decreased by 28.2 beats per minutes. This finding showed that there was a significant improvement on cardiovascular fitness performance of the study subjects after 12 weeks training.

The step test result was compared with an international step test norms among similar age groups that range from 16 and 20 years (www.topendsport.com). The international step test norms is 148- 121 for this age groups while the step test mean value result of this study was 121.86. The international step test norms is indicated on Appendix of this manuscript.

4.3. Mean and SD Values of Twelve minutes Run Test Performance

Table 2: Mean value +SD of pre, during and post-tests of Twelve minutes Run results (meter) of study subjects

Quasi Experimental group				
Variable	N	PT	DTT	POT
TMR	30	**2572.3±171.3**	**2723.9±150.32**	**2843.46±68.7**

Values are in the form of mean + SD, SD = are standard deviation, PT, = pre training test, DTT= during training test, PoT= post training test, min = minute and TMR = twelve minutes run.

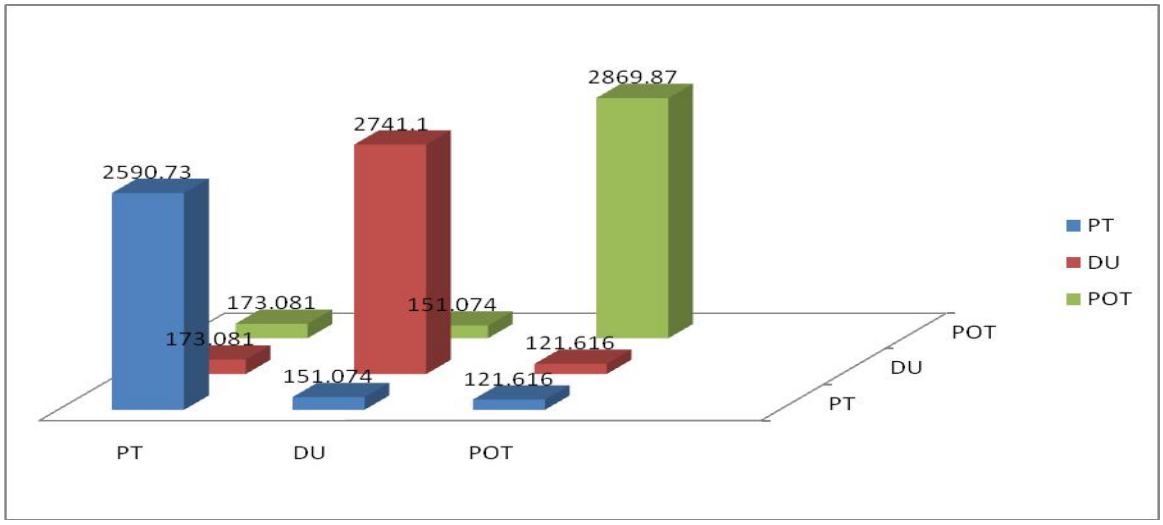

Figure 2:Mean comparison among pre,During and Post Test Results Of Twelve minute Running

As depicted on the above table 5 and Figure 2 that there was a significant improvement observed in twelve minutes run (in meter) pre-post training tests mean values score of 12 weeks exercise. The mean value of pre training tests results of twelve minutes run was 2590.73 ± 173.081, during training test mean value result was 2741.1±151.074 and post training test mean value result of twelve minutes run were 2869.87 ± 121.616. From these results the researcher were observed the significant improvements in their performance of the subjects due to aerobic exercises. When we compare 12 minutes run of pre and post test result of the participants after 12 weeks of exercises program. It showed the significant increments on the performance of the subjects within **279.133** meters mean differences. This result showed there was significant improvement in the performance of the participants‟ cardiovascular abilities.

The standard norms for 12 minutes run test for male athletes whose age ranges from 16 to 20 was compared with the study result. Standard norms for this test ranges from 2700 – 3000 meters (Cooper, 1968) while the study result was found to be 2843.46 meters in 12 minutes run. Hence, the result of this finding is above average standard.The international 12 minutes run. test norm is indicated on Appendix of this manuscript

4.4. The Mean Difference Value and Significance Level of Each Tests

Table 3: The Mean Differences Value and Significance Level of Each Test Result of the parameters

Variables	Para(I)	Para(ii)	MD(i-ii)	Sig
Step test	PoT	PT	28.2	0.000
		DTT	12.36	0.000
		DTT	3.5	0.000
TMR	PoT	Pt	279.133	0.000
		DTT	150.37	0.000

Para = parameter I and II, PT = pre training test, DTT= during training test, PoT= post training test, MD= mean differences, Sig= significance, TMR = Twelve minutes run.

As depicted on the above table 7, the table showed results of step test, and twelve minutes run. The mean difference value of step test from pre-test and post test result was **28.2** beats per minute as compared pre test to during test 12.36 beats / minute. These indicate the mean differences value varies from one test to another. When we compare pre-post test results of the 12 minutes run after the exercise program of 12weeks, there was an increased mean difference within 279.133meter distances.

The findings of this study results showed there were significant improvements on three months aerobic exercises parameters in athletic performances.

The results of these findings were compared with that of international standard norms. According to standard norms the test result of Step test and 12 minutes run were in the above average standard level with the norms

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary

Some individuals breathe so efficiently that they supply with oxygen every part of their body where the food is stored and produce energy abundantly. In other individuals, however, the oxygen is not supplied sufficiently to all places. They are easily fatigued and cannot endure for a long time. In simple terms, they are physically incapable in comparison to aerobically capable individuals. During aerobic training, the cardiovascular system (the heart, lungs and blood vessels) reacts on the increased level of physical activity by the increased intake and usage of the oxygen for the purpose of releasing the energy. There had been proficiency problems which had resulted from Cardiovascular Endurance of Athletes at the project under study. Therefore, to achieve the purpose of current study, it was examined Aerobic exercises in order to improve Cardiovascular Endurance performance of Athletes‟ abilities in the case Sululta Chancho Oromiya Leyou Zone Athletics Project. To achieve the purpose of this study, 30 male Athletes were selected between the age group of 16 and 20 years. All of them were grouped in one experimental group. In order to attain the objective of the research, the study subjects of sport proficiency were measured through fitness parameters based on their cardiovascular endurance exercises. The parameters used to measure cardiovascular endurance were: Step test and twelve minutes run was applied on the study subjects. In addition, parameters like: resting heart rate and exercises heart rate was used in this study. The exercise schedule was designed for 3 months. At which three days exercise session per week with 60 minutes duration and low to moderate intensity was applied. Each 60 minute sessions were divided in to three phases: warming up, main parts (exercises for fitness) and cooling down phases. The data was collected from the study subjects; and analyses was done through using SPSS version (V20)software based on the test results, which collected from the study subjects .The paired sample t-test was used in this study. Based on the result analysis made, at the end of the study it was observed that resting heart rate of the participants were reduced significantly due to the exercise program and significant change were observed in improvement of cardiovascular endurance (exercise heart rate) measurements.

5.2 . Conclusion

Based on the major findings of the study to examine aerobic exercises in improving cardiovascular endurance performance of athletes the following points were stated as conclusions as follows. It was observed that an intimate difference between pre and post physical fitness performances of the subjects of the study. Thus, the finding of this study showed that, there were improvements on cardio respiratory endurance performance of the participants after 12 weeks exercises of 12 minutes run. There was the decrements that had on the heart beats of the subjects after 12 weeks exercise program on endurance, when we compared the heart beats of pre and post test of the subjects. From the results of the research findings it was shown that decreased on the resting heart rate and increased on exercise heart rate of the participants after 12 weeks exercises. For the results decreasing and increasing the main reason was aerobic exercise training also found by the current study.When we compared 12 minutes run of pre and post test results of the participants after 12 weeks exercise program, it was found significant increments on the performance of the subjects within 279.133meters mean differences. The result showed that significant improvement in the performance of participants‟ had cardiovascular endurance .

5.3.Recommendations

Considering the major findings and conclusions of the study, it is important to put (state) the following points as recommendations for investigate more effects of selected aerobic exercise training in improving cardiovascular endurance performance of Athletes.

Sport science professionals and departments need to guide and educate the importance of aerobic exercise along with well planned program of specific aerobic training exercises with an increase in the training period to improve their heart rate.

Giving the athletes 12min run of pre and post tests of 12 week program seems to have greatly improves the cardiovascular endurance as it increases the performance of athletes'.

Woreda Youth and Sport Office should create an experience sharing opportunity with other project coaches.

The coach should make trainers(athletes) follow the training manual strictly.

Coaches should follow and provide up to date training standards.

Further researches may follow the methodology in more sophisticated manner; while this study used as a spring-board for the improvement of cardiovascular performance of Athletes by using longer training period.

Further researchers may conduct their studies on more different types of strength and endurance exercises that could improve Athletes‟ performances.

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7. APPENDIXES

Appendix- A Consent To Participate Voluntarily In This Research Study

Researcher's Name: Aschenaki Alemu **Deme**

Major Supervisor's Name: Desta Enyew (PhD)

Co- Supervisor's Name: Abinet Ayalew (PhD)

Thesis Title:

'Effect Of Selected Aerobics Exercise On Cardiovascular Endurance: The Case Of Sululta Chancho Oromiya Leyou Zone Athletics Project; Oromiya Regional State, Ethiopia.

You are being asked to participate in this research study as described below. All research studies carried out like this one are governed by the regulations for research on human beings. These regulations require that the researcher should obtain a signed agreement (consent) from you to participate in this research project. The researcher will explain to you in detail the purpose of the project, the procedures to be used, the potential benefits and the possible risks of participation in this study. You can ask the researcher any questions that you may have about the study, and expect to receive satisfactory answers regarding the same. A basic explanation of the project is summarized below.

After discussion, if you agree to participate in the study, please sign this form in the presence of the researcher. You may discontinue at any time from the study if you choose to do so.

1. Purpose and Procedures:

The purpose of this research project is to improve cardiovascular endurance ability of athlete students on the selected Aerobic fitness variables. The subjects to be involved in this study were being 30 male athlete. This study requires your participation to perform a certain tests in measuring the aerobic fitness variables. I certify that I have read and fully understood the above project; therefore, I consent to participate in this study.

Name of subject: _____

Signature: _____

Address: _____

Date: _____

I certify that I clearly explained the nature of the study, Purpose of potential benefits and that may be possible risks involved in this research Study.

Signature of Investigator: _____ Date:_____

2. Risks and the Benefit:

The risks of this research study are small. While administering the tests and during training sessions you may experience localized muscle fatigue in your thighs i.e., cardiac muscle. You might feel some muscle soreness and fatigue during and after the cessations of the training exercises and tests. But we do not expect any unusual risks as a direct result of this study. If any unexpected physical injury occurs, appropriate first aid will be provided, but no financial compensations will be given.

3. Confidentiality:

The information obtained about you will be kept in confidence, although you are free to release it to your own physician. The information will be used only for scientific purposes without tidying you as an individual.

4. **Contact Address: S**ululta Chancho Wereda Leyou Zone Athletics Project(SCHWLZ)
   - Aschenaki Alemu **Deme**→ +251-920358862
   - E-mail Address → **aschenakidema@gmail.coms**

I certify that I have read and fully understood the above project; therefore, I consent to participate in this study.

Name of subject: _____ Signature: _____

Address: _____ Date: _____

I certify that I clearly explained the nature of the study, Purpose of potential benefits and that may be possible risks involved in this research Study.

Signature of Investigator: _____ Name _____

Date: _____

Appendix- B: Health history and physical activity readiness questionnaires of Participants

This questionnaire is designed to obtain information on the health status and physical readiness of the subjects participating for the research study. The information will be kept strictly confidential. For athlete: please read the following question carefully and indicate your correct response to each question by encircling it on the choice letter given.

1. Do you have a recent physical injury such as bone, muscle and joint which will be aggravated by physical exercise? A. Yes B. No

If yes indicate the type of injury that you had_____

2. Do you have suffered with heart condition? A. Yes B. No

3. Identify any medical problems that you had

A. Cardiovascular C. Respiratory E. None

B. Neuromuscular D. Metabolic

4. Have you ever felt pain in your chest when you do physical exercise?

A. Yes B. No

5. Are you taking any prescription medicines recently?

A. Yes B. No

If yes, name them below:-

Name of drug Do_____ _____

_____ _____

6. Have you ever suffered from shortness of breath at rest or with mild exercise?

A. Yes B. No

7. Is there any history of Coronary Heart Disease within your family?

A. Yes B. No

8. Do you ever feel feint, have spells of dizziness or have you ever lost consciousness?

9. Do you currently drink more than the average amount of alcohol per week (21units for men and 14 units for women (1 unit = ½ pint of beer/cidr/larger or 1small glass of wine)

A. yes B. No

10. Do you currently smoke? A. Yes B. No

11. Do you NOT currently exercise regularly (at least 2 times per week) and/or work in a job that is physically demanding.

A. Yes B. No

12. Do you know of any other reason why you should not participate in a program of physical activity?

A. Yes B. No

If yes explain your reason here

I hereby state that I have read, understood and answered honestly the questions above. I also state that I wish to participate in activities, which may include aerobic exercise and anaerobic exercises.

Client's full Name: _____Trainer's Name:_____

Client's Signature: _____ Trainer's Signature:_____

Date: _____Date:_____

Appendix- C: Training Schedule for Three Months

Table:1 Training schedule for first month of October, 2019

Days per week	Types of exercise	Duration 60min	Frequency /repetition	Rest	Intensity exercise
Monday 5:00pm_5:50 pm	**Warming up exercise:** different types of general and specific warming up will be employed session	10min	1x10min	5min	Light intensity 50-60%
	mini foot ball game	5 min	1x5min		
	Walking	5 min	2x5min		
	Jogging	5 min	2x5min		
	Rope jumping	8 min	1x8min		
	Sep up and down	10 min	1x10min		
	Step aerobics exercise	7 min	1x7min		
	Cooling down: different types of stretching.	5min	1x5min		
Wednesday 5:00pm_6:00 pm	**Warming up exercise:** General and specific warming up will be employed session	10min	1x10min	30 seconds rest b/n each exercise.	Light intensity 50_64%
	Mini football game	5min	2x6min		
	Walking	5min	*3x5min*		
	Jogging	5min	*4x5min*		
	Rope jumping,	10 min	4x5min		
	Sep up and down	10min	2x10min		
	Step aerobics exercise	6min	31x6min		
	Cooling down: different types of stretching	5min	1x5min		
Friday 5:00pm_6:00 pm	**Warming up exercise:** different types of general and specific warming up.	10min	1x10min	5min	Moderate intensity 60_69%
	Mini football game	5min	1x5min		
	Walking,	5min	2x5min		
	Aerobic conditioning with Jogging,	5min	3x5min		
	Rope jumping,	8min	2x8min		
	Sep up and down, and	10min	3x10min		
	Step aerobics exe.	7min	2x7min		
	Cooling down: different types of stretching	5min	2x5min		

The above schedules was performed on October 2019.

Table:2 Training Schedule for Second Month of November, 2019

Days per week	Types of exercise	Duration 60min	Frequency /repetition	Rest	Intensity exercise
Monday 5:00pm_5:50 pm	**Warming up exercise:** different types of general and specific warming up will be employed session	10min	4x10min	5min	Light intensity 50-65%
	Track work out	7min	6x7min		
	12 minutes run (on running track)	10min	7x10min		
	Jogging	5min	8x5min		
	Rope jumping	8min	4x8min		
	Step up and down	5min	9x5min		
	Step aerobics exercise	5min	7x5min		
	Cooling down: different types of stretching.	5min	7x5min		
Wednesday 5:00pm_6:00 pm	**Warming up exercise:** General and specific warming up will be employed session	10min	2x10min	5min	Light intensity 50_67%
	Track workout	10min	7x10min		
	Walking	5min	7x9min		
	Jogging	10min	8x10		
	Rope jumping,	10min	10x5min		
	Step up and down	5min	8x5min		
	Step aerobics exercise	5min	9x5min		
	Cooling down: different types of stretching	5min	2x5min		
Friday 5:00pm_6:00 pm	**Warming up exercise:** different types of general and specific warming up.	10min	1x10min	5min	Moderate intensity 60_70%
	Track workout	7min	1x7min		
	Walking,	5min	2x5min		
	Jogging,	8min	2x4min		
	Rope jumping,	8min	2x4min		
	Sep up and down, and	6min	9x8min		
	Step aerobics exe.	6min	7x4min		
	Cooling down: different types of stretching	5min	3x4min		

The above schedules was performed on November, 2019

Table:3 Training Schedule for Third Month of December,2019

Days per week	Types of exercise	Duration 60min	Frequency /repetition	Rest	Intensity exercise
Monday 5:00pm_5:50 pm	**Warming up exercise:** different types of general and specific warming up will be employed session	10min	5x10min	5min	Light intensity 50-69%
	Walking	4min	6x4min		
	Jogging	4min	8x4min		
	Rope jumping	10min	10x10min		
	Track work out	5min	12x5min		
	Sep up and down	6min	14x6min		
	Step aerobics exercise	11min	16x11min		
	Cooling down: different types of stretching.	5min	0x5min		
Wednesday 5:00pm_6:00 pm	**Warming up exercise:** General and specific warming up will be employed session	10min	12x10min	5 min	Light intensity 50_70%
	Walking	4min	13x4min		
	Jogging	4min	15x4min		
	Rope jumping,	10min	17x10min		
	Track work out	5min	18x5min		
	Sep up and down	6min	20x6min		
	Step aerobics exercise	11min	21x11min		
	Cooling down: different types of stretching	5min	14x5min		
Friday 5:00pm_6:00 pm	**Warming up exercise:** different types of general and specific warming up.	10min	1x10min	5min	Moderate intensity 60_75%
	Walking,	4min	22x4min		
	Jogging,	4min	24x4min		
	Rope jumping,	10min	25x10min		
	Track out	5min	12x5min		
	Sep up and down, and	6min	25x6min		
	Step aerobics exe.	11min	23x11min		
	Cooling down: different types of stretching	5min	12x5min		

The above schedules was performed on December 2019.

Appendix-D: Normative Data of Step Test and 12 Minute Run Tests of Male Athletes

Table:4 Normative Data of Step Test

Age **16 to 19**	Excellent	Above average	Average	Below average	Poor
Male	**< 121**	**148-121**	**156-149**	**162-157**	**>162**
Female	**< 129**	**158-129**	**166-159**	**170-167**	**>170**

Source:(www.topendsport.com)

Table:5 Normative Data of 12 Minute Run Test

Age	**Excellent**	**Above Average**	**Average**	**Below Average**	**Poor**
13-14	>2700m	2400-2700m	2200-2399m	2100-2199m	<2100m
15-16	>2800m	2500-2800m	2300-2499m	2200-2299m	<2200m
17-19	>3000m	**2700-3000m**	2500-2699m	2300-2499m	<2300m
20-29	>2800	2400-2800m	2200-2399m	1600-2199m	<1600m
30-39	>2700	2300-2700m	1900-2299m	1500-1999m	<1500m
40-49	>2500	2100-2500m	1700-2099m	1400-1699m	<1400m
>50	>2400	2000-2400m	1600-1999m	1300-1599m	<1300m

Source: (Cooper, 1968)

Appendix-E:Raw data of step- tests and Twelve Minute Run Tests

Table:6 Raw data of step- tests

Serial code of subject	Pre–test	During-test	Post-test
1	142	130	142
2	160	152	140
3	134	136	124
4	170	154	120
5	130	134	124
6	158	150	116
7	135	120	120
8	146	140	136
9	165	152	138
10	140	130	114
11	142	140	134
12	152	132	128
13	156	148	140
14	140	126	120
15	148	132	126
16	148	136	130
17	146	138	128
18	148	140	118
19	144	128	114
20	152	146	124
21	152	140	130
22	144	130	118
23	160	148	124
24	158	148	114
25	148	130	124
26	148	128	112
27	152	138	128
28	142	128	116
29	142	128	112
30	144	128	116
Mean value	148.20	137.00	120.00

Table:7 Raw Data of Twelve Minute Run Tests

Serial codes of subject	Pre test	During test	Post test
1	2702m	2810 m	2960 m
2	2440 m	2547 m	2706 m
3	245o m	2505 m	2800 m
4	2750 m	2780 m	2973 m
5	2650 m	2780 m	2850 m
6	2710 m	2805 m	2980 m
7	2712 m	2807 m	2890 m
8	2647 m	2780 m	2810 m
9	2620 m	2705 m	2802 m
10	2800 m	2900 m	3000 m
11	2400 m	2500 m	2706 m
12	2450 m	2570 m	2700 m
13	2536 m	2720 m	2810 m
14	263o m	2810 m	2890 m
15	2625 m	2750 m	2890 m
16	2536 m	2720 m	2810 m
17	2715 m	2895 m	2980 m
18	2110m	2400 m	2700 m
19	2530 m	2690 m	2700 m
20	2450 m	2525 m	2695 m
21	2620 m	2750 m	2845 m
22	2630 m	2900 m	3105 m
23	2100 m	2480 m	2700 m
24	2805 m	2960 m	3005 m
25	2802 m	2964 m	3050 m
26	2705 m	2900 m	2985 m
27	2740 m	2830 m	2900 m
28	2615 m	2820 m	2950 m
29	2620 m	2825 m	2894 m
30	2627 m	2806 m	3010 m
Mean value	2590.73	2741.1	2869.87

Appendix-F: Paired Sample T-Tests of Parameters

Table:8 Paired Sample T-Test Results Of Step Test

	Paired Differences					t	Difference	Sig. (2-tailed)
	MD	SD	SE	95%Confidence interval of difference				
				Lower	Upper			
Pre step test-During step test	11.200	5.726	1.045	9.062	13.338	10.714	29	.000
During step test-post step test	17.00	25.286	4.617	7.558	26.442	3.682	29	.000
Pre step test-Post step test	28.200	25.934	4.735	18.884	37.884	5.956	29	.000

Table:9 Paired Sample T-Test Result of Twelve Minutes Run

	Paired Differences					t	Diff	Sig(2tailed)
	MD	SD	SE	95%confidence diff.				
				Lower	Upper			
Pretest-Du.test	-150.400	72.735	13.279	-177.56o	-123.240	-11.326	29	.000
DU.test-post test	-128.733	71.834	13.115	-155.557	-101.910	-9816	29	.000
Pre.test – Pot.test	-279.133	109.386	19.971	-319.979	-238.288	-13.977	29	.000

Appendix-G: LIST OF FIGURES IN THE APPENDIX

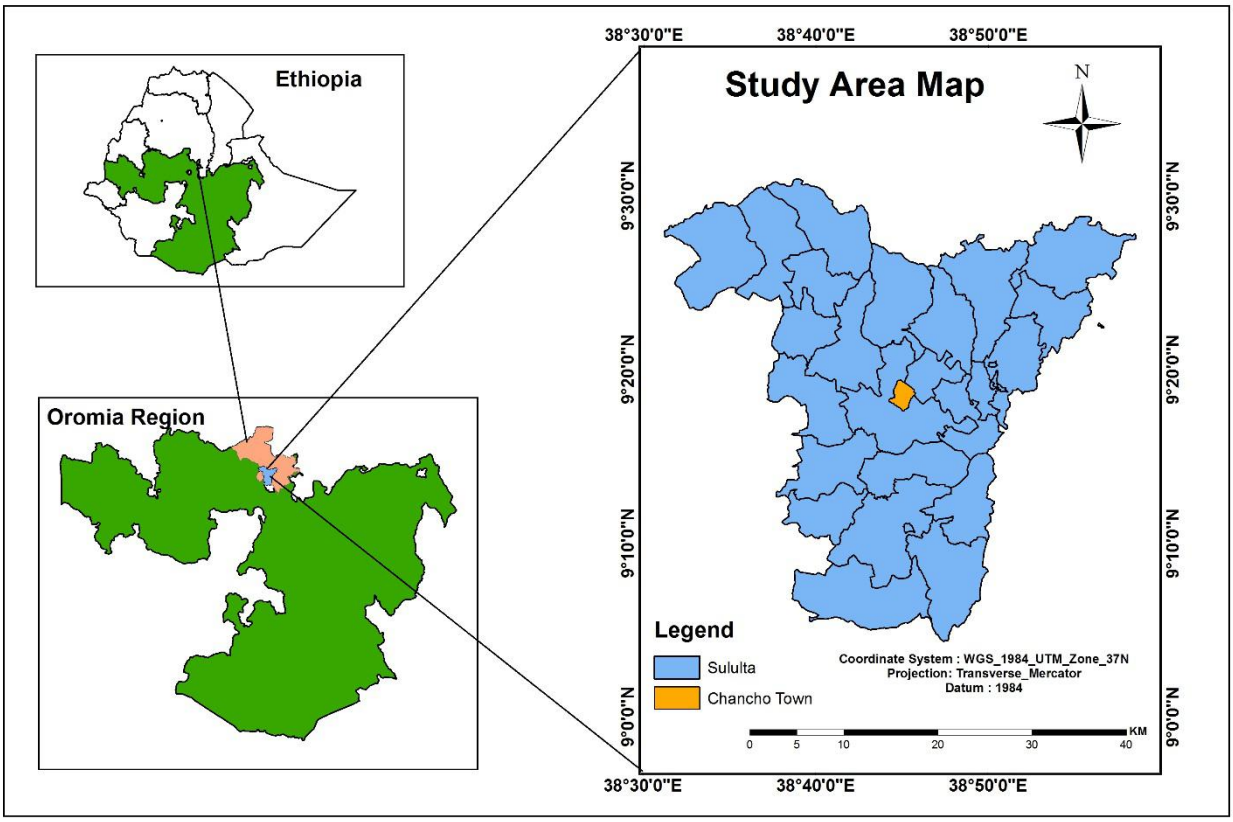

Figure 1: Map of the study area
Source: GIS(2019)

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