

**EFFECT OF PHYSICAL FITNESS TRAINING ON HEALTH STATUS
OF FOOTBALL PLAYERS OF DODOLA TOWN, WEST ARSI ZONE,
OROMIA REGIONAL STATE, ETHIOPIA**

MSc THESIS

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HARAMAYA UNIVERSITY, HARAMAYA

**Effect of physical fitness training on health status of football players of
Dodola Town, West Arsi Zone, Oromia Regional State, Ethiopia**

**A Thesis Submitted to the Department of Sport Science,
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**In Partial Fulfillment of the Requirements for the Degree of
MASTER OF SCIENCE in Sport Medicine**

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DEDICATION

I dedicated this thesis manuscript to my beloved Aunt, Son, and Mother for nursing me with affection and for her immense contribution in the success of my life.

STATEMENT OF THE AUTHOR

First, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and compilation of this Thesis. Any scholar matter that is included in the Thesis has been given recognition through citation.

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ACRONYMS AND ABBREVIATIONS

BMI	Body Mass Index
BPM	Beat per Minute
CFS	Chronic Fatigue Syndrome
CPHA	Canadian Public Health Association
CUT	Chin Up Test
HST	Home Step Test
MD	Mean Difference
MHR	Maximum Heart Rate
NASPE	National Association for Sport and Physical Education
NSCA	National Strength and Conditioning Association
PARQ	Physical Activity Readiness Questionnaires
POT	Post Training Test
PT	Pre Test
RHR	Resting Heart Rate
RPE	Rating of Perceived Exertions a Step Aerobics
SPSS	Statistical Package for Social Sciences
SRT	Sit and Reach Test
STT	Sitting Tucks Test
USDHHS	United States Department of Health and Human Services

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Effect of physical fitness training on health status of football players of Dodola Town,
West Arsi Zone, Oromia Regional State, Ethiopia

ABSTRACT

Aerobic exercise is one way to improve physical and psychological aspects of health. The role of exercise was to improve players performance and reduce in risk of premature mortality due to coronary heart disease and other illnesses is widely accepted, The purpose of this study was to assess the effect of 12 Weeks Aerobics Training on Selected Health Related Physical Fitness of Football Players: The Case of Dodola Town; West Arsi Zone, Oromia Regional State, Ethiopia. The study was randomized experimental design was used for this study. The players were selected using simple random sampling technique. All 30 trainees were participate (CG = 15) and (EG = 15). In this study the dependent variable selected health related physical fitness includes flexibility, muscular strength and cardiovascular endurance which were tested using sit and reach test, standing long jump and 2.4Km (6laps) respectively, while independent variable was.12 week aerobics training protocol. Data were entered into SPSS version 25. Mean and standard deviation was used to analyze demographic characteristics of sprinters. Friedman rank test was used to analyze the effect of 12 weeks aerobic training on health related physical fitness of football players. The level of significance was set at $p < 0.05$. The study result shows that statistical significance was observed among experimental group of flexibility, muscular strength and cardiovascular endurance across pretest, during and posttest. The study concludes that 12 weeks aerobics training on selected health related physical fitness of football players: The Case of Dodola Town; West Arsi Zone, Oromia Regional State, Ethiopia. The study recommends that to coaches so as to incorporate 12 Weeks Aerobics Training in their training program.

Keywords: Cardiovascular Endurance, Physical Fitness, Aerobic Exercises and Performance

1. INTRODUCTION

1.1. Background of the study

A low level of physical fitness and life-style-related diseases during childhood and adolescence are associated with an increased risk of cardiovascular disease during adulthood. (Telama *et al.*, 2001) Recent estimates suggest that many adolescents and children do not achieve the recommended level of physical activity that is required to cause a reduction in the risk for cardiovascular disease and physiological disorders during childhood and adolescence. (Steinberger *et al.*, 2003)

Studies investigating the health-related physical fitness benefits of regular physical activity participation have focused primarily on aerobic exercise, including treadmill or outdoor running and cycle ergometry, (Nybo *et al* 2009). However, adherence to these modes of physical activity (e.g., continuous running) in the general population, and especially in adolescents, is relatively low, perhaps because such activities are perceived as isolating and boring. There is, therefore, a need to find more enjoyable modes of training that elicit great adherence by optimizing intrinsic motivation while offering health benefits that match those accomplished by treadmill and cycle ergometer programs. In this context, recreational soccer may be a popular alternative for those seeking to improve their cardiovascular, metabolic, and musculoskeletal fitness, (Krustrup *et al.*, 2010).

Only few studies have investigated the health effects of soccer-based training in adolescence, (Hammami *et al.*, 2017). In these studies, it was reported that obese adolescent boys improved a range of health markers, such as a reduction in body fat and blood pressure, an increase in high-density lipoprotein cholesterol, and VO₂max after 12 weeks of organized recreational soccer training. To the best of our knowledge, no data exist on the effects of recreational soccer in untrained normal-weight adolescents. Moreover, no data exist on the acute effects of different forms of small-sided games on perceived enjoyment for adolescent boys.

According to World Health Organization, (WHO, 1948), Health is defined as not only briefers to the absence of disease and infirmity but also to a state of complete physical, mental and social well-being Physical activity is one way to improve physical and psychological aspects of health. The role of exercise in the reduction in risk of premature mortality due to coronary heart disease and other illnesses is widely accepted (Heyward, 1991).As an idea cited on the document in International Society of Sport Psycholgy (ISSP), growingnumber of experimental studies and the existence of several plausible theoretical explanation support the idea that regular exercise yields mental health benefits.(Biddle.,*et al.*, 2000).

Many research reviews have clearly reported that exercise, especially aerobic exercise, isnegatively associated with trait anxiety and depression and positively related to indices of mental health such as well-being and self-concept. There is a consensus on the role of acute exercise in the reduction of anxiety in non-clinical populations indicated that although acute effects of exercise in anxiety reduction on the normal population is clear, chronic effects are less clearly demonstrated. However, some researchers have investigated the chronic effects of exercise, (McDonald and Hodgdon, 1991).

A growing body of research has highlighted the health benefits of recreational soccer training in sedentary but otherwise healthy adults and obese or various patient populations. Recent reviews Bangsbo J.*et al.*, 2015), suggest that regular participation in recreational soccer can enhance both physical fitness and health status in untrained individuals. It has been shown for example, that a period of 12–24 weeks of soccer training caused a 7%–15% increase in the maximum amount of oxygen utilized (VO₂max) in previously untrained participants. Moreover, 12 weeks of soccer training in young and middle-aged men led to a significant decrease (15%) in low-density lipoprotein cholesterol, (Krustrup, 2010).

1.2.Statement of the problem

Studies investigating the health-related physical fitness benefits of regular physical activity participation have focused primarily on aerobic exercise, including treadmill or outdoor running and cycle ergo meters. However, adherence to these modes of physical activity (e.g., continuous running) in the general population, and especially in adolescents, is relativelylow, perhaps because such activities are perceived as isolating and boring. (Stroyer, *et al.*, 2004).

Recent reviews suggest that regular participation in recreational physical fitness can enhance both physical fitness and health status in untrained individuals. It has been shown that a period of 12–24 weeks of physical fitness training caused a 7%–15% increase in the maximum amount of oxygen utilized (VO₂max) in previously untrained participants. Moreover, 12 weeks of physical fitness training in young and middle-aged men led to a significant decrease (15%) in low-density lipoprotein cholesterol. (Sheppard, *et al.*, 2006).

Only few studies have investigated the health effects of physical fitness-based training in football. In different studies, it was reported that obese boys improved a range of health markers, such as a reduction in body fat and blood pressure, an increase in high-density lipoprotein cholesterol, and VO₂max after 12 weeks of organized recreational physical fitness training. The aim of the study therefore to investigate The Effect of Physical Fitness Training On Health Related Physical Fitness components On Football Project Players Regarding this, the researcher didn't refer any documents studied towards Dodola Town Football project on this title. So that, the researcher is interested to assess the effect of 12 weeks aerobic training on health status of Dodola Town Football project players through the following basic research questions:

- What is effect of physical fitness training on flexibility of Dodola Town male football players?
- Does physical fitness training on bring a change muscular strength of Dodola Town male football players?
- Do effect of physical fitness training on affect cardiovascular endurance of Dodola Town male football players?

1.3. Scope of the study

The study was delimited to assess the effect of 12 weeks aerobic training on health status of Dodola Town Football project players. The study also delimited to dependent variable such as flexibility, muscular strength and cardiovascular endurance and independent variable was 12 weeks aerobic training. This study was conducted in 2019/20.

1.4. Significance of the study

This study attempts to assess the effect of physical fitness training on health related physical fitness of football Players: the case of Dodola town. So, it will be significant to players of the town in order to manage their health by identifying the benefits of physical fitness training. The study will serve as source of knowledge for others stakeholders. Further it helps for policy makers on health and physical fitness related issues and serves as input for other researchers for further study.

1.5. Objectives of the Study

1.5.1 General Objective

The general objective of this research was effect of physical fitness training on health status of football players of Dodola Town, West Arsi Zone, Oromia Regional State, Ethiopia

1.5.2 Specific Objective

The specific objectives of this study were:

- ❖ To assess the effect of physical fitness training on flexibility of Dodola Town male football players
- ❖ To determine the effect of physical fitness training on muscular strength of Dodola Town male football players
- ❖ To assess the effect of physical fitness training on cardiovascular endurance of Dodola Town male football players?

2. RELATED REVIEW LITERATURE

2.1. Concepts of Physical Fitness

Physical fitness refers to maximum functional capacity of all system of the body. We are exercising whenever we move and keeping our body tuned and in a good running order. The body of human is framed in such a way that it can jump, climb, bend, stretch and do more tedious work. The human body becomes stronger as it exerts more and muscles involvement matters a lot in shaping it. Exercise helps in improving our health and builds up our energy and stamina. Physical fitness is the capacity to do work effectively with joy and pleasure. After the work is over, he still has sufficient capacity to do more work without any exertion. Moreover, his recovery must be faster and quicker (Bouchard and Rankinen , 2001).

Physical fitness is a proper functioning of physiological system which is related to an individual daily work or task. The term physical fitness has wide meaning as more than the possession of strength, speed, endurance. The person who remains energetic, cheerful, and enthusiastic in doing his work is said to be physically fit. Its level vary from person to person depending upon the nature of work, size, shape, structure, sex and age of an individual, (SA football player needs to meet at least minimum physical, physiological and psychological requirements to cope with the demands of competition and reduce the risk of injury. Soccer is characterized as vigorous, high intensity, intermittent, ball and contact sport. Functional activities include acceleration, deceleration, jumping, cutting, pivoting, turning, heading and kicking of the ball. It is obvious that the game of football puts many demands on the technical and physical skills of the individual player; Football is a fast moving and exciting game requiring quick thinking as well as physical skills. It gives pleasure to players and spectators alike, the greater the skill, greater the pleasure but the game football is an opportunity to combine, intelligence speed of judgment, speed of physical and mental reaction and expertise with the balltroyer, 2004).

2.2. Aerobic Fitness

Aerobic activity, also known as cardio or endurance activity is the cornerstone of most fitness training programs. Aerobic activity or exercise causes you to breathe faster and more deeply, which maximizes the amount of oxygen in our blood. Our heart will beat faster, which increases blood flow to our muscles and back to our lungs. The better our aerobic fitness, the more efficiently our heart, lungs and blood vessels transport oxygen throughout our body and the easier it is to complete routine physical tasks and rise to unexpected challenges, such as running to our car in the pouring rain. Aerobic activity includes any physical activity that uses large muscle groups and increases our heart rate. Try walking, jogging, biking, swimming, dancing, water aerobics even leaf raking, snow shoveling and vacuuming, (Bangsbo, 2006).

For most healthy adults, the Department of Health and Human Services recommends that you get at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week, or a combination of moderate and vigorous activity. The guidelines suggest that you spread out the exercise during the course of a week. You can even break up activity into shorter periods of exercise and aim to move more during the day. Any amount is better than none at all. You can also try high-intensity interval training, which involves alternating short bursts of intense activity (around 30 seconds) with subsequent recovery periods (around three to four minutes) of lighter activity. For example, you could alternate periods of brisk walking with periods of leisurely walking, or include bursts of jogging in our brisk walks, (Bouchard and Rankinen, 2001).

2.3. Strength Training

Muscular fitness is another key component of a fitness training program. Strength training can help you increase bone strength and muscular fitness, and it can help you manage or lose weight. It can also improve our ability to do everyday activities. Aim to include strength training of all the major muscle groups into our fitness routine at least twice a week. Most fitness centers offer various resistance machines, free weights and other tools for strength training. But you don't need to invest in a gym membership or expensive equipment to reap the benefits of strength training. Hand-held weights or homemade weights such as plastic soft drink bottles filled with water or sand may work just as well. Resistance bands are another inexpensive option.

Our own body weight counts, too. Try pushups, pull-ups, abdominal crunches and leg squats, (Caspersen, 1985).

2.4. Core exercises

The muscles in our abdomen, lower back and pelvis known as our core muscles help protect our back and connect upper and lower body movements. Core strength is a key element of a well-rounded fitness training program. Core exercises help train our muscles to brace the spine and enable you to use our upper and lower body muscles more effectively. So what counts as a core exercise? A core exercise is any exercise that uses the trunk of our body without support, such as bridges, planks, sit ups and fitness ball exercises (Caspersen, 1985)

2.5. Balance Training

Balance exercises can help you maintain our balance at any age. It's generally a good idea for older adults in particular to include exercises to maintain or improve balance in their routine exercises. This is important because balance tends to deteriorate with age, which can lead to falls and fractures. Balance exercises can help older adults prevent falls and maintain their independence. However, anyone can benefit from balance training, as it can help stabilize our core muscles. Try standing on one leg for increasing periods of time to improve our overall stability. Activities such as tai chi can promote balance, too. (Foss *et al.*, 1998)

2.5.1. Flexibility and Stretching

Flexibility is an important aspect of physical fitness, and it's a good idea to include stretching and flexibility activities in a fitness program. Stretching exercises can help increase flexibility, which can make it easier for you to do many everyday activities that require flexibility. Stretching can also improve the range of motion of our joints and may promote better posture. Regular stretching can even help relieve stress and tension. Consider stretching after you exercise when our muscles are warm and receptive to stretching. But if you want to stretch before a workout, warm up first by walking or exercising for five to 10 minutes before stretching. Ideally, you'll stretch whenever you exercise. If you don't exercise regularly, you might want to stretch at least two to three times a week after warming up to maintain flexibility. Activities such as yoga promote flexibility (Stroyer, 2004).

2.5.2. Cover all the bases

Whether you create our own fitness training program or enlist the help of a personal trainer, our

overall exercise plan should include several elements. Aim to incorporate aerobic fitness, strength training, core exercises, balance training, and flexibility and stretching into our exercise plan. It isn't necessary to fit each of these elements into every fitness session, but factoring them into our regular routine can help you promote fitness for life. (Harms CA, 2000)

2.6. Importance of Physical Fitness Training for Health

Exercise is defined as any movement that makes our muscles work and requires our body to burn calories. There are many types of physical activity, including swimming, running, jogging, walking and dancing, to name a few. Being active has been shown to have many health benefits, both physically and mentally. According to the statement of Harms (2000) physical fitness training is very importance in every body's life.

2.7. Physical Fitness makes Happier

Exercise has been shown to improve our mood and decrease feelings of depression, anxiety and stress. It produces changes in the parts of the brain that regulate stress and anxiety. It can also increase brain sensitivity for the hormones serotonin and nor epinephrine, which relieves feelings of depression. Additionally, exercise can increase the production of endorphins, which are known to help produce positive feelings and reduce the perception of pain. Furthermore, exercise has been shown to reduce symptoms in people suffering from anxiety. It can also help them be more aware of their mental state and practice distraction from their fears interestingly, it doesn't matter how intense our workout is. It seems that our mood can benefit from exercise no matter the intensity of the physical activity. In fact, a study in 24 women who had been diagnosed with depression showed that exercise of any intensity significantly decreased feelings of depression (Harms, 2000).

The effects of exercise on mood are so powerful that choosing to exercise (or not) even makes a difference over short periods. One study asked 26 healthy men and women who normally exercised regularly to either continue exercising or stop exercising for two weeks. Those who stopped exercising experienced increases in negative mood (Stroyer, 2004)

2.8. Physical Fitness for Weight Loss

Some studies have shown that inactivity is a major factor in weight gain and obesity (to understand the effect of exercise on weight reduction, it is important to understand the relationship between exercise and energy expenditure. Our body spends energy in three ways:

digesting food, exercising and maintaining body functions like our heart beat and breathing. While dieting, a reduced calorie intake will lower our metabolic rate, which will delay weight loss. On the contrary, regular exercise has been shown to increase our metabolic rate, which will burn more calories and help you. Additionally, studies have shown that combining aerobic exercise with resistance training can maximize fat loss and muscle mass maintenance, which is essential for keeping the weight off (Heyward, 1991).

2.9. Physical Fitness for Muscles and Bones strength

Exercise plays a vital role in building and maintaining strong muscles and bones. Physical activity like weight lifting can stimulate muscle building when paired with adequate intake. This is because exercise helps release hormones that promote the ability of our muscles to absorb amino acids. This helps them grow and reduces their breakdown (As people age, they tend to lose muscle mass and function, which can lead to injuries and disabilities. Practicing regular physical activity is essential to reducing muscle loss and maintaining strength as you age. Also, exercise helps build bone density when you're younger, in addition to helping prevent osteoporosis later in life. Interestingly, high-impact exercise, such as gymnastics or running, or odd-impact sports, such as soccer and basketball, have been shown to promote a higher bone density than non-impact sports like swimming and cycling (Eric and Corbett, 2009).

2.10. Physical Fitness for increasing Our Energy Levels

Exercise can be a real energy booster for healthy people, as well as those suffering from various medical conditions. One study found that six weeks of regular exercise reduced feelings of fatigue for 36 healthy people who had reported persistent fatigue. Furthermore, exercise can significantly increase energy levels for people suffering from chronic fatigue syndrome (CFS) and other serious illnesses. In fact, exercise seems to be more effective at combating CFS than other treatments, including passive therapies like relaxation and stretching, or no treatment at all. Additionally, exercise has been shown to increase energy levels in people suffering from progressive illnesses, such as cancer, HIV/AIDS and multiple sclerosis (Gutin, 1980).

2.11. Physical Fitness Reduce Risk of Chronic Disease

Lack of regular physical activity is a primary cause of chronic disease. Regular exercise has been shown to improve insulin sensitivity, cardiovascular fitness and body composition. In contrast, a lack of regular exercise even in the short term can lead to significant increases in belly fat, heart

disease and early death. Therefore, daily physical activity is recommended to reduce belly fat and decrease the risk of developing these diseases, (Sporis, 2008).

2.12. Physical Fitness for Skin Health

Our skin can be affected by the amount of oxidative stress in our body. Oxidative stress occurs when the body's antioxidant defenses cannot completely repair the damage that free radicals cause to cells. This can damage their internal structures and deteriorate our skin. Even though intense and exhaustive physical activity can contribute to oxidative damage, regular exercise can increase our body's production of natural [antioxidants](#), which help protect cells. In the same way, exercise can stimulate blood flow and induce skin cell adaptations that can help delay the appearance of skin aging. (Heyward, 1991).

2.13. Physical Fitness for Brain Health and Memory

Exercise can improve brain function and protect memory and thinking skills. To begin with, it increases our heart rate, which promotes the flow of blood and oxygen to our brain. It can also stimulate the production of hormones that can enhance the growth of brain cells. Regular physical activity is especially important in older adults since aging combined with oxidative stress and inflammation promotes changes in brain structure and function. Exercise has been shown to cause the hippocampus, a part of the brain that's vital for memory and learning, to grow in size. This serves to increase mental function in older adults lastly; (Reilly, 1997) Regular exercise can help you relax and better. In regards to sleep quality, the energy depletion that occurs during exercise stimulates recuperative processes during sleep. Moreover, the increase in body temperature that occurs during exercise is thought to improve sleep quality by helping it drop during sleep many studies on the effects of exercise on sleep have reached similar conclusions. You can be flexible with the kind of exercise you choose. It appears that either aerobic exercise alone aerobic exercise combined with resistance training can equally help sleep quality (Caspersen, 1985) chronic pain can be debilitating, but exercise can actually help reduce it. In fact, for many years, the recommendation for treating chronic pain was rest and inactivity. However, recent studies show that exercise helps relieve chronic pain A review of several studies indicates that exercise helps participants with chronic pain reduce their pain and improve their quality of life several studies show that exercise can help control pain that's associated with various health conditions,. Additionally, physical activity can also raise pain tolerance and

decrease pain perception (Gutin, 1980).

3. MATERIALS AND METHODS

This part presents the methodological aspects of the study. It contains description of the research design employed, research site, population of the study, sample and sampling techniques, data collection instrument, data collection procedures and method of data analysis.

3.1. Description of Study Area

This study was conducted at Dodola town in which it is located at the South Eastern part of Ethiopia. Specifically Dodola Town is found in West Arsi Zone of Oromia Regional State. The town has a latitude and longitude of 06°59'N and 39°11'E, respectively with an elevation ranging from 2362meters to 2493 meters above sea level. It is the administrative center of Dodola woreda, at which a distance of 305km from the Capital City of Ethiopia.

3.2. Study Design

Pre-test, during and post-test complete randomized experimental design was used for this study. Simple random sampling technique was used to select trainees. All 30 trainees currently participate in the training program was invited for study. The participants divided equally in to two groups 15 subjects' experimental group and 15 subjects control group through randomly. Pre-test, during and post-test was given to both experimental and control group. Only Experimental group was trained conditioning exercise for 40-60 minutes of 3 non constitutive days per a week for 12 weeks.

3.3. Study Materials

During this research process instruments like box, whistles, stop watch, meter, sit and reach test box, record sheet, paper and pen was be used.

3.3. Sources of Data

The researcher used primary sources of data for this study. This data were collected from football players using standardized field tests such body composition (BMI), muscular strength (standing long jump), Cardiovascular endurance (2.4km) and s flexibility (it and reach).

3.4. Population of the study

The study population at Dodola city male Football projects between the ages of 15 and 17 years. The total Population was 30 male football trainers.

3.6. Sample size and Sampling technique.

In this research, the researcher preferred to use small number of participants on the basis of participant knowledge, its elements and purpose of the study may be members of subjects were easily identified from its larger population (Babbie,2007). In this context, the ultimate purpose of this objective this study was to take entire population of the study which was thirty number (n = 30). Based on simple random sampling two groups (n=2) were divided into both control group (CG = 15) and experimental group (EC =15).

The researcher used 30 male adolescent whose ages ranged from 15 to17 were selected through random sampling method and participated in the study voluntarily. These participants were done 12 weeks aerobic exercise three days a week for 45-60 minutes. Each players have given written informed consent to participate in the study after all of the experimental risks, procedures, physical challenges, and time demands were explained.

3.7. Inclusive and Exclusive Criteria

The health statuses of the subject were asses by physical activity readiness questionnaire the subjects who were free from any impairment or disability and chronic disease were included for the study and subjects who could not fulfill these criteria were exclude from the study.

3.8. Identification of variables

3.8.1. Dependent variables

In this study the dependent variable selected health related physical fitness includes flexibility,muscular strength and cardiovascular endurance which were tested using sit and reach test, standing long jump and 2.4Km (6laps) respectively.

3.8.2. Independent variables

The researcher used 12 weeks aerobics training as an independent variable of the study. The training was given to check whether 12 weeks aerobics training affect selected health related physical fitness includes flexibility,muscular strength and cardiovascular endurance

3.9. Types of Data and Data Collection Methods

The investigator used quantitative data from field tests. From the beginning, the physical fitness readiness questions were filled by the trainees to know the status of participants about their health and fitness to select the participants. Next, the researcher tested pretest, during and posttest physical fitness test on the outlined variables, at the middle continuous 12 weeks aerobics training program. The fitness tests included BMI (Body composition), standing long jump (strength), 2.4km (Cardiovascular endurance) and sit and reach (flexibility). The data's were recorded by the researcher and assistants collaboratively. A careful familiarization phase was undertaken with each participant before the start of the study so that learning effects would be minimized. All measurements for testing were made with the identical equipment, positioning, test technicians, and technique for each subject.

3.10. Procedures for administration of fitness tests

The investigator followed standardized procedures to measure the selected variables and register the scores on fitness recording sheet with other assistants. Before the administration of the test the trainees were given chance to practice the prescribed test so that trainees become familiar with the test and knew exactly what was to be done and how to use the equipments. To make the testing condition uniform, all the subjects took the test only during the morning session.

3.10.1. Measuring body composition Body mass index (BMI)

Tape measure Scale Purpose: To estimate relative body fat with a tape measure and weight scale. Procedure; -Height and weight are measured, and the scores are rounded to the nearest 0.5 cm and 0.5 kg. The client is lightly dressed, without shoes. Height is measured with the client standing barefoot with heels together and back as straight as possible. Head is positioned at a level (Frankfort level) where the opening of the outer ear and lower level of the eye socket form an imaginary, horizontal line. The tester may support the head from both sides at the mastoid process to ensure the correct position. Weight is recorded, using a scale. To calculate BMI, weight (kg) is divided by height squared (m²).

3.10.2. Measuring muscular strength

3.10.2.1. Standing Long Jump Test

Purpose: The objective of this test is to monitor the development of the athlete's elastic leg strength.

Equipments: Long jump pit, 30 metre tape measure and assistant.

Procedure: The athlete places their feet over the edge of the sandpit. The athlete crouches, leans forward, swings their arms backwards, then jumps horizontally as far as possible, jumping with both feet into the sandpit. The coach should measure from the edge of the sandpit to the nearest point of contact. The start of the jump must be from a static position. Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement. Reliability would depend upon how strict the test is conducted and the individual's level of motivation to perform the test.

Score: the maximum performed jump was taken in meter

3.10.3. Cardiovascular Endurance test

3.10.3.1. The 2.4km Run Test

Purpose: The objective of this test is to monitor the development of the athlete's aerobic endurance.

Equipment: 400metre track, Stop watch and Assistant.

Procedure: Athlete to complete a 10 minute warm up, athlete to run 2.4 km (6 laps of a 400m track) as fast as possible and assistant to keep athlete informed of the number of laps remaining to complete the test

Score: assistant to record the time taken for the athlete to run 2.4km.

3.10.4. Measuring Flexibility

3.10.4.1. Sit and Reach Test

Purpose:-To measure the development of the trainees lower back and hamstring flexibility.

Equipment:-Meter Ruler, tape, box or bench about 20cm high and assistant.

Procedure:-The trainees warm up for 10 minutes and then removes their shoes, the assistant secures the ruler to the box top with the tape so that the front edge of the box lines up with the 15cm mark on the ruler and the zero end of the ruler points towards the athlete, the athlete sits on the floor with their legs fully extended with the bottom of their bare feet against the box, the

athlete places one hand on top of the other, slowly bends forward and reaches along the top of the ruler as far as possible holding the stretch for two seconds, the assistant records the distance reached by the athlete's finger tips (cm), the athlete performs the test three times. Scoring:-The assistant, add the three distances and uses the average for this value to assess the athlete's performance.

3.11. Exercise Training Protocol

All groups were engaged in conditional exercise for two weeks. In the third week, they started the continuous aerobics training program. The trainees did three days per week with 8 minute of warm up and 3minute stretching, 16minutes of main activity, 4minute of cool dawn and stretching. The training program was designed in agreement with subjects and the training staff. From the beginning up to the end of this study the trainees were given a clear orientation not participate in any physical activities other than this one.

3.12. Method of Data Analysis

Data were entered into SPSS version 25. Mean and standard deviation was used to analyze demographic characteristics of sprinters. Friedman rank test was used to analyze the effect of physical fitness training on health status of football players of Dodola Town, West Arsi Zone, Oromia Regional State, Ethiopia. The level of significance was set at $p < 0.05$.

3.13. Data Quality Control

To reduce the mistakes that occurred during data collection process, assistant data collectors and trainers had taken training how to collect and organize the data. To reduce the mistakes which could be occurred during data collection and to collect the appropriate data, three assistant recorders were trained among student's trainers. In addition to that practical test and measurements were recorded with photograph for farther check on test and measurement procedures and protocols.

3.14. Research Ethics

The study would deal with the ethical issues and code of conduct related to the investigation. It made the participants guarantee and confidential of the information that would be given to the study and risk of harm due to participations. Therefore, the study was conducted according to the rules, regulations, policies and code of ethics of Haramaya University.

4. RESULTS AND DISCUSSIONS

In this chapter four data collected from football project players were analyzed based on the objectives setted below. Mean and standard deviation was used to analyze demographic characteristics of sprinters. Friedman rank test was used to analyze the effect of physical fitness training on health status of football players of Dodola Town, West Arsi Zone, Oromia Regional State, Ethiopia, effect of physical fitness training on muscular strength of Dodola Town male football players and to assess the effect of physical fitness training on cardiovascular endurance of Dodola Town male football players. The analyzed data were supplemented by literature.

4.1. Demographic characteristics of Dodola Town Male Football Players

Table 4. 1 Demographic characteristics of Dodola Town Male Football Players

S.n	Variables	Statistic	Control Group	Experimental Group
1.	Age	Mean	16.80	16.93
		Std	.414	.458
2.	Height	Mean	1.73	1.69
		Std	.053	.019
3.	Weight	Mean	62.67	63.73
		Std	3.99	3.26
4.	BMI	Mean	19.55	19.86
		Std	1.20	.61

The above descriptive statistics of demographic characteristics of Dodola Town Male Football Players both control group and experimental group were as discussed below. The control group age was $(16.80 \pm .414)$, experimental group age was $(16.93 \pm .458)$. The control group height was $(1.73 \pm .053)$, experimental group height was $(1.69 \pm .019)$.The control group weight was

(62.67 ± 3.99), experimental group weight was (63.73 ± 3.262).The control group BMI was (19.55 ± 1.20), experimental group BMI was (19.86 ± .61).

The above analysis implies that the age of footballers were almost similar that their range from 16-17 year old. Footballers height swing from 1.68-1.78m high. Footballers weight ranges from 58-66kg.The body mass index of footballers were from 19-21 BMI. Hence footballers demographic characteristics were almost similar. Similar studies suggested that football players demographic characteristics were almost similar (Zorba *et al.*, 2000). From the physiological parameter including age, height, weight and BMI, the subject of the study could bring a change after physical fitness intervention for 12 weeks (Kraemer *et al.*, 2000).

4.2. The effect of 12 weeks aerobic training on flexibility of Dodola Town male football players

Table 4. 2 The effect of 12 weeks aerobic training on flexibility of Dodola Town male football players

S.n	Flexibility test	Mean Rank	Df	χ^2	Sign
1.	CG Sit & Reach Pretest	2.00	14	3.00	.22
2.	CG Sit & Reach During	1.90			
3.	CG Sit & Reach Posttest	2.10			
4.	EG Sit & Reach Pretest	1.00	14	29.10	.00
5.	EG Sit & Reach During	2.07			
6.	EG Sit & Reach Posttest	2.93			

Friedman Rank test reveals that CG Sit & Reach Posttest was not statistically higher than during intervention in the same way during intervention result was also not statistically significantly higher than CG Sit & Reach Pretest of flexibility test $\chi^2 = 3.00$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among CG Sit & Reach pretest, during and posttest due to 12 weeks aerobic training intervention. From this one can understand that effective 12 weeks aerobic training intervention does not show statistically significant difference on control group flexibility of Dodola Town male football players.

The above table of Friedman Rank test reveals that EG Sit & Reach Posttest was statistically significantly higher than during intervention in the same way during intervention result was also

statistically significantly higher than pretest EG Sit & Reach Posttest at $\chi^2 = 29.10$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among experimental group pretest, during and posttest due to 12 weeks aerobic training intervention. This shows that effective 12 weeks aerobic training intervention show statistically significant difference on experimental group flexibility of Dodola Town male football players.

In agreement with this finding similar finding confirmed that aerobic exercise brought a change on flexibility of football players during their early adolescent period (Hallage *et al.*, 2010). The other finding would like to support that the aerobic exercise training intervention enhance football players static stretching to ensure maximal range of motion along with an enhancement football performance (Michael, 2012). This indicates that enhance hamstring and low back hamstring flexibility would likely enhance players performance (O'Sullivan, 2009).

The 12 weeks of step aerobics training enhances sit and reach test for adults (Devis *et al.*, 2000). Other experimental research also supplement that 12 weeks step aerobics test enhance sit and reach performance Hallage *et al.* (2010). They found that flexibility was significantly affected after step aerobic exercises in adults (Mc Ardle *et al.*, 2000).

4.3. The effect of 12 weeks aerobic training on muscular strength of Dodola Town male football players

Table 4. 3 The effect of 12 weeks aerobic training on muscular strength of Dodola Town male football players

S.n	Muscular strength	Mean Rank	Df	χ^2	Sign
1.	CG Standing long jump pretest	1.87	14	4.66	.097
2.	CG Standing long jump during	2.17			
3.	CG Standing long jump posttest	1.97			
4.	EG Standing long jump pretest	1.07	14	28.13	.000
5.	EG Standing long jump during	1.93			
6.	EG Standing long jump posttest	3.00			

The above table of Friedman Rank test reveals that CG Standing long jump pretest was not statistically higher than during intervention in the same way during intervention result was also

not statistically significantly higher than CG Standing long jump pretest $\chi^2 = 4.66$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among CG Standing long jump pretest, during and posttest due to 12 weeks aerobic training intervention. From this one can understand that effective 12 weeks aerobic training intervention does not show statistically significant difference on control group muscular strength of Dodola Town male football players.

The above table of Friedman Rank test reveals that EG Standing long jump posttest was statistically significantly higher than during intervention in the same way during intervention result was also statistically significantly higher than EG Standing long jump pretest at $\chi^2 = 28.13$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among experimental group pretest, during and posttest due to 12 weeks aerobic training intervention. This shows that effective 12 weeks aerobic training intervention show statistically significant difference on experimental group muscular strength of Dodola Town male football players.

Supporting this finding Beashel and Taylor (1996) confirmed that 12 weeks aerobic intervention the muscular strength of gymnasium works. In some other study also significant improvements have been obtained in isometric strength at the end of 12 weeks of aerobics training (Pavone *et al.*, 1985).

In contrary to this finding Murphy *et al.*, (1996) said that there was no significant improvement in muscular strength at the end of 12 weeks of step aerobics training in the experimental groups. The rationale behind no change on muscular strength may vary across sport discipline and the modality specific (Baker *et al.*, 1994). The insignificant improvements in muscular strength might be a result of measuring isometric strength, because aerobics is a dynamic activity. Similarly, Koenig *et al.*, (1995) and Velazquez and Wilmore (1985) indicated no significant improvement in muscular strength, which was measured by dynamic strength at the end of a 10- and 12-week aerobics period; however, other studies indicated significant improvements in dynamic arm and leg strength at the end of 12 weeks of step aerobics, respectively (Kraemer *et al.*, 2001, Kravitz, 1993).

4.4. The effect of 12 weeks aerobic training on cardiovascular endurance of Dodola Town male football players

Table 4. 4 The effect of 12 weeks aerobic training on cardiovascular endurance of Dodola Town male football players

S.n	Cardiovascular endurance	Mean Rank	Df	χ^2	Sign
1.	CG 2.4km run test pretest	1.93	14	2.15	.341
2.	CG 2.4km run test during	2.20			
3.	CG 2.4km run test posttest	1.87			
4.	EG 2.4km run test pretest	3.00	14	30	.000
5.	EG 2.4km run test During	2.00			
6.	EG 2.4km run test posttest	1.00			

The above table of Friedman Rank test reveals that CG 2.4km run test posttest was not statistically higher than during intervention in the same way during intervention result was also not statistically significantly higher than CG 2.4km run test pretest $\chi^2 = 2.15$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among CG 2.4km run test pretest, during and posttest due to 12 weeks aerobic training intervention. From this one can understand that effective 12 weeks aerobic training intervention does not show statistically significant difference on control group cardiovascular endurance of Dodola Town male football players.

The above table of Friedman Rank test reveals that EG 2.4km run test posttest was statistically significantly higher than during intervention in the same way during intervention result was also statistically significantly higher than EG 2.4km run test pretest at $\chi^2 = 30$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among experimental group pretest, during and posttest due to 12 weeks aerobic training intervention. This shows that effective 12 weeks aerobic training intervention show statistically significant difference on experimental group cardiovascular endurance of Dodola Town male football players.

In agreement with this finding, significant changes on adult muscular endurance due step aerobic training intervention. The other study described that 12 weeks of step aerobics exercise resulted significant changes on the aerobic fitness of men adult trainee, effectiveness of step aerobics exercise on cardiovascular fitness the increase in oxygen consumption in adults (Jakubec *et al.*, 2008). In disagreement, 12 weeks of step aerobics training resulted with no significant changes on adult muscular endurance (Mc Ardle *etal.*, 2000).

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary

The purpose of this study was to assess the effect of physical fitness training on health status of football players of Dodola Town, West Arsi Zone, Oromia Regional State, Ethiopia. The researcher set the following research questions to be answered: Do physical fitness training affect flexibility of Dodola Town male football players? Do physical fitness training affect muscular strength of Dodola Town male football players? And do physical fitness training affect cardiovascular endurance of Dodola Town male football players?

The study was randomized experimental design was used for this study. The players were selected using simple random sampling technique. All 30 trainees were participate (CG = 15) and (EG = 15). In this study the dependent variable selected health related physical fitness includes flexibility, muscular strength and cardiovascular endurance which were tested using sit and reach test, standing long jump and 2.4Km (6laps) respectively. These independent variable of the study was 12 week aerobics training protocol. Data were entered into SPSS version 25. Mean and standard deviation was used to analyze demographic characteristics of sprinters. Friedman rank test was used to analyze the effect of 12 weeks aerobic training on health related physical fitness of football players. The level of significance was set at $p < 0.05$.

The result of this study shows that EG Sit & Reach posttest was statistically significantly higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest EG Sit & Reach Posttest at $\chi^2 = 29.10$, $P < 0.05$.

The result of this study suggests that EG Standing long jump posttest was statistically significantly higher than during intervention likewise during intervention result was also statistically significantly higher than EG Standing long jump pretest at $\chi^2 = 28.13$, $P < 0.05$.

The result of this study depicts that EG 2.4km run test posttest was statistically significantly higher than during intervention in the same way during intervention result was also statistically significantly higher than EG 2.4km run test pretest at $\chi^2 = 30$, $P < 0.05$.

5.2. Conclusions

- The finding of this study concluded that physical fitness training brought about statistical significant difference across pretest, during and posttest of flexibility test of experimental group.
- While, statistical significant difference was no observed across the control group. This indicates that physical fitness training was preferred training protocol to improve the flexibility performance of youth football players.
- The study reports that physical fitness training brought about statistical significant difference across pretest, during and posttest of cardiovascular endurance of experimental group.
- There was statistical insignificant difference was not found across the control group. This indicates that physical fitness training was recommended training protocol to enhance the cardiovascular endurance performance of youth football players.

5.3. Recommendations

Based on the study conclusion, the following recommendations were drawn.

- The study shows that physical fitness training was preferred training protocol to improve the flexibility performance of youth football players. The researcher recommended football coaches to include aerobics training protocol in their training sessions.
- This study shows that physical fitness training enhanced the muscular strength performance of youth football players. The researcher recommended football coaches to incorporate aerobics training protocol in their training program.
- The study suggested physical fitness training was recommended training protocol to enhance the cardiovascular endurance performance of youth football players. The researcher recommended football coaches to incorporate aerobics training protocol in their training program.

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41.

7. APPENDIXES

APPENDIX –A

Physical Activity Readiness Questionnaires (PARQ)

I. Questionnaires to be Filled by Participants

1. The physical load of my job is

- A. Light B. Medium heavy C. Heavy D. I am not employed

2. To what leisure time physical activity group do you belong?

Please take into consideration all leisure time physical effort that lasted at least 20 minutes at a time within the last three months.

- A. practically no physical activity weekly B. Light or relaxed physical activity one or more times a week energetic and brisk physical activity C. About once a week D. Twice a week E. Three times a week F. At least four times a week

3. What is your most common modes of physical activity or sports recently?

A. Most typical modes of sport or other physical activity _____

B. Second, most typical mode of sport or other physical activity _____

C. Third most typical mode of sport or other physical activity _____

4. Has your leisure time physical activity changed during the last three months in comparison with earlier?

- A. it has increased B. there has been no notable change

C. it has decreased

5. How are your possibilities (time, money, facilities, and instruction) and interest in being regularly physically active in your current life situation?

A. good possibility 1 very interested

B. considerable possibilities 2 somewhat interested

C. poor possibilities 3 not interested whatsoever

II. Health Questionnaires Circle the most suitable alternative in response to the following questions.

6. How do you estimate your own health status?

A. very poor B. poor C. average D. good E. very good

7. How do you estimate your physical fitness in comparison with that of other persons of the same age? A. clearly poorer B. somewhat poorer C. just as good D. somewhat better E. considerably better

8. Do you have a heart disease, circulation disorder or lung disease that has been diagnosed by a doctor?

A. Yes B. No

9. Do you ever experience chest pain or breathlessness

A. While resting? A. Yes B. No ?

B. While physically active?

A. Yes B. No

10. Has a doctor ever stated that your blood pressure is permanently increased (Do you suffer from "hypertension")? A. Yes B. No

11. Have you smoked regularly during the last six months? A. Yes B. No

12. Do you often feel faint or have dizzy spells? A. Yes B. No

13. Have you ever been diagnosed by a doctor as having an inflammatory disease of the joints?

A. Yes B. No

14. Do you have low back problems or any other chronic or recurring musculoskeletal disorder?

A. Yes B. No

15. Do you have any other health-related reason (that is not mentioned above) that would limit your participation in physical activity, even though you want to participate? A. Yes

B. No What? _____

16. Are you currently taking any medication? A. Yes

B. No What? _____

17. Have you had the flu or a fever during the last two weeks? A. Yes B. No

18. Have you imbibed a substantial amount of alcohol within the last 24 hours (more than 2 restaurant-size drinks)? A. Yes B. No

APPENDIX-B

Participants Information Sheet and a Consent Form

Researcher's Name: Meaza Mesele G/Sellasie

Major Supervisor's Name: Abnet Ayalew (PhD)

Co-Supervisor's Name: Desta Enyew (PhD)

Thesis Title: THE EFFECT OF PHYSICAL FITNESS TRAINING ON HEALTH STATUS OF FOOTBALL PLAYERS OF DODOLA TOWN, WEST ARSI ZONE, OROMIA REGIONAL STATE, ETHIOPIA.

You are being asked to participate in this study as described below. This study will be carried out and governed by the regulations on human beings. These regulations require that the researcher should obtain a signed agreement (consent) from the participants.

1. Purpose of the Study

The purpose of the study is to investigate the effects of step-aerobic exercise on the health related components of physical fitness namely; muscular endurance, muscular strength, flexibility, cardio respiratory fitness and body composition of senior fitness for health trainees. The findings of this study may contribute largely for the community. More over the aim of this study is to write a thesis for the partial fulfillment of master program in teaching physical education.

2. Procedure and Duration

This experimental study will take 12 weeks and involve 30 subjects from the town. The trainees will participate in the moderate step-aerobics training program of 3 days per week. These subjects also participate in physical performance test in three phases; at the beginning, in the middle of training and at the end of 12 weeks training.

3. Risks and Benefits

If physical activity is performed in abnormal physiological condition, it would result in pain, eventually it would result in death. Therefore, you are advised to give up the physical activity immediately if you feel one of the following signs: abnormal heart rate; too fast or too slow breathing rate, coughing etc. In case if you face injury or pain, the researcher will provide first aid and if it is severe, the researcher will cover every cost for you to recover. There is no payment for you because of your participation to this study.

However, it is hoped that, in the future the society will benefit from this study by understanding the effects of step-aerobic exercises.

2. Confidentiality

Your test result and other related personal information's will be kept confidential. The findings of the study will be general for the study community and will not reflect anything particular of the individual. The data/test results that collected from subjects will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: Participation in this study will be a fully voluntary based. You have the right to declare to participate or not in the study. And if you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled.

3. Contact Address

If there are any questions or enquires about the study or the procedures, please contact at the following address:

- Meaza Mesele G/Sellasi+251973029366
Email: meazam25@gmail.com
- AbinetAyalew (PhD) +251911827322

Email: amenab2012@Yahoo's.com

- Desta Enyew (PhD.) +251938310940

Email: destaenyew@yahoo.com

I have clearly understood the purpose of the research study. I declare my voluntary consent to engage in this study.

Signature of participant _____

Name _____

Date _____

APPENDIX-C

Standing Long Jump Test

The objective of this test is to monitor the development of the athlete's elastic leg strength.

Required resources

To undertake this test you will require:

- Long jump pit
- 30 metre tape measure
- Assistant.

How to conduct the test
The athlete:

The athlete places their feet over the edge of the sandpit. The athlete crouches, leans forward, swings their arms backwards, the jumps horizontally as far as possible, jumping with both feet into the sandpit. The coach should measure from the edge of the sandpit to the nearest point of contact. The start of the jump must be from a static position.

Analysis

Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement.

Reliability

Reliability would depend upon how strict the test is conducted and the individual's level of motivation to perform the test.

APPENDIX-D

Cardiovascular Endurance test (The 2.4km Run Test)

The objective of this test is to monitor the development of the athlete's aerobic endurance.

Required resources

To undertake this test you will require:

- 400metre track
- Stop watch
- Assistant.

How to conduct the test

The test is conducted as follows:

- Athlete to complete a 10 minute warm up
- Athlete to run 2.4 km (6 laps of a 400m track) as fast as possible
- Assistant to keep athlete informed of the number of laps remaining to complete the test
- Assistant to record the time taken for the athlete to run 2.4km.

Analysis

Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement.

Target group

This test is suitable for active athletes but not for individuals where the test would be contraindicated.

Reliability

Reliability would depend upon how strict the test is conducted and the individual's level of motivation to perform the test.

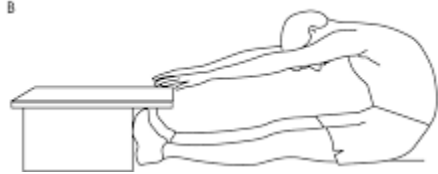
Validity

There are no published tables to relate results to potential performance in competition.

APPENDIX-E

Flexibility test (Sit and Reach Test)

The objective of this test is to monitor the development of the athlete's lower back and hamstring flexibility.



Required resources

To undertake this test you will require:

- 'Sit & reach' table or a bench with a ruler
- Assistant

How to conduct the test

The sit and reach test is conducted as follows:

- The starting position is sitting on the floor with shoes removed, feet flat against the table, and legs straight
- Reach forward and push the fingers along the table as far as possible
- The distance from the finger tips to the edge of the table represents the score for that person
- As the 'sit and reach' table has an overhang of 15 cm, a person who reaches 10 cm past their toes scores 25 cm
- It is important to have several warm-up attempts first, and to record the best score

Analysis

Analysis of the result is by comparing it with the results of previous tests. It is expected that,

with appropriate training between each test, the analysis would indicate an improvement.

APPENDIX-F

Physical fitness Training protocol

Table 3. 1. Physical fitness Training protocol to improve the health quality

Weeks	Aerobic Exercise s	Set x Reps	Intensity	Equipment
Week 01	Home step	2x10'	Low	Step
	Sit-up	2x 8	Low	Rowing machine
	Push-up	3x 8	Low	Lat pull down machine
	Squat	2x 5	Low	Free weight
	Standing jump	5 x 12	Low	
	Lat pull down	3x8	Low	
	Hamstring exercise	5x12	Low	
Week 02	Home step	3x10'	Medium	Step
	Sit-up	3x8	Medium	Rowing machine
	Push-up	3x8	Medium	Lat pull down machine
	Squat	3x5	Medium	Free weight
	Standing jump	4x20	Medium	
	Lat pull down	4x12	Medium	
	Hamstring exercise	4x12	medium	
Week 03	Home step	3x10'	Medium	Step
	Sit-up	4x10	Medium	Rowing machine
	Push-up	4x10	Medium	

	Squat	3x8	Low	Lat pull down machine
	Standing jump	4x10	Low	Free weight
	Lat pull down	4x20	Medium	
	Hamstring exercise	5x12	Medium	
Week 04	Home step	3x10'	Medium	Step
	Sit-up	4x10	Medium	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	3x10	Medium	Free weight
	Standing jump	3x10	Medium	
	Lat pull down	4x20	Medium	
	Hamstring exercise	5x12	Low	
Week 05	Home step	3x10'	Medium	Step
	Sit-up	4x10	Medium	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	4x6	Medium	Free weight
	Standing jump	4x15	Medium	
	Lat pull down	4x20	Medium	
	Hamstring exercise	5x12	Low	
Week 06	Home step	3x10'	Low	Step
	Sit-up	4x10	Low	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	4x8	Medium	
	Standing jump	4x12	Low	

	Lat pull down	4x20	Medium	Free weight
	Hamstring exercise	5x12	medium	
Week 07	Home step	3x10'	Medium	Step
	Sit-up	4x10	Medium	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	4x8	Low	Free weight
	Standing jump	3x15	Medium	
	Lat pull down	4x20	Low	
	Hamstring exercise	5x12	Medium	
Week 08	Home step	3x10'	Medium	Step
	Sit-up	4x10	Low	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	4x10	Medium	Free weight
	Standing jump	4x15	Low	
	Lat pull down	4x20	Medium	
	Hamstring exercise	5x12	medium	
Week 09	Home step	3x10'	Medium	Step
	Sit-up	4x10	Low	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	5x6	Medium	Free weight
	Standing jump	3x15	Low	
	Lat pull down	4x20	Medium	
	Hamstring	5x12	Medium	

	exercise			
Week 10	Home step	3x10'	Medium	Step
	Sit-up	4x10	Low	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	5x8	Medium	Free weight
	Standing jump	4x10	Low	
	Lat pull down	4x20	Medium	
	Hamstring exercise	5x12	Medium	
Week 11	Home step	3x10'	Medium	Step
	Sit-up	4x10	Medium	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	4x8	Low	Free weight
	Standing jump	3x15	Medium	
	Lat pull down	4x20	Low	
	Hamstring exercise	5x12	Medium	
Week 12	Home step	3x10'	Medium	Step
	Sit-up	4x10	Medium	Rowing machine
	Push-up	4x10	Medium	Lat pull down machine
	Squat	3x10	Medium	Free weight
	Standing jump	3x10	Medium	
	Lat pull down	4x20	Medium	
	Hamstring exercise	5x12	Low	

APPENDIX-G

Table 1. Raw data of Control group Subjects demographic data

S.n	Code	Age	Height	Weight	BMI
1.	Code1	17	1.8	63	18.35
2.	Code2	17	1.77	58	19.53
3.	Code3	17	1.74	60	19.86
4.	Code4	16	1.76	62	20.06
5.	Code5	17	1.82	59	18.81
6.	Code6	17	1.69	67	20.49
7.	Code7	17	1.72	60	19.94
8.	Code8	16	1.67	63	19.06
9.	Code9	17	1.68	70	21.73
10.	Code10	17	1.65	70	18.38
11.	Code11	17	1.74	60	19.86
12.	Code12	16	1.76	62	20.06
13.	Code13	17	1.82	59	18.81
14.	Code14	17	1.69	67	20.49
15.	Code15	17	1.72	60	19.94

APPENDIX-H

Table 2. Raw data of Experimental group Subjects demographic data

S.n	Code	Age	Height	Weight	BMI
1.	Code1	17	1.7	60	20.76
2.	Code2	17	1.72	65	19.64
3.	Code3	17	1.7	69	20.41
4.	Code4	17	1.67	67	20.5
5.	Code5	16	1.73	60	20.06
6.	Code6	17	1.69	63	19.59
7.	Code7	17	1.7	65	19.03
8.	Code8	17	1.68	60	19.73
9.	Code9	18	1.69	61	19.89
10.	Code10	17	1.67	62	18.7
11.	Code11	17	1.7	69	20.41
12.	Code12	17	1.67	67	20.5
13.	Code13	16	1.73	60	20.06
14.	Code14	17	1.69	63	19.59
15.	Code15	17	1.7	65	19.03

APPENDIX-I

Table 3. Raw data of Control group flexibility

Sit and reach test Pretest	Sit and reach test During	Sit and reach test Posttest
30	30	30
15	14	15
12	12	12
16	16	16
14	14	14
16	16	16
17	17	17
10	10	11
18	18	18
15	15	15
12	12	12
16	16	16
14	14	14
16	16	16
17	17	17

APPENDIX-I

Table 4. Raw data of Experimental group flexibility

Sit and reach test Pretest	Sit and reach test During	Sit and reach test Posttest
17	18	19
15	16	16
7	8	9
13	13	14
29	29	30
20	21	21
21	22	23
19	20	21
22	24	24
18	20	21
7	8	9
13	13	14
29	29	30
20	21	21
21	22	23

APPENDIX-J

Table 5. Raw data of Control group muscular strength

Standing long jump Pretest	Standing long jump During	Standing long jump Posttest
2.3	2.3	2.3
2.5	2.5	2.5
2.56	2.57	2.56
2.6	2.6	2.6
4.4	4.4	4.4
1.8	1.8	1.8
1.9	1.9	1.9
1.96	1.96	1.96
2	2.01	2.01
1.95	1.95	1.95
2.56	2.57	2.56
2.6	2.6	2.6
4.4	4.4	4.4
1.8	1.8	1.8
1.9	1.9	1.9

APPENDIX-K

Table 6. Raw data of Experimental group muscular strength

Standing long jump Pretest	Standing long jump During	Standing long jump Posttest
2.41	2.4	2.5
2.62	2.65	2.7
2.69	2.72	2.8
2.51	2.55	2.65
2.56	2.7	2.79
2.07	2.15	2.25
2.02	2.1	2.15
1.85	1.9	2.9
1.96	1.98	1.99
2	2.05	2.1
2.69	2.72	2.8
2.51	2.55	2.65
2.56	2.7	2.79
2.07	2.15	2.25
2.02	2.1	2.15

APPENDIX-L

Table 7. Raw data of Control group cardiovascular endurance

2.4km pretest	2.4km During	2.4km Posttest
06:50.5	06:50.5	06:50.5
06:51.1	06:51.1	06:51.1
06:54.7	06:54.7	06:54.7
06:11.4	06:11.4	06:11.4
06:11.3	06:11.4	06:11.4
06:11.3	06:11.4	06:11.3
06:59.7	06:59.7	06:59.7
06:12.5	06:12.5	06:12.5
06:12.6	06:12.6	06:12.6
06:13.7	06:13.7	06:13.7
06:54.7	06:54.7	06:54.7
06:11.4	06:11.4	06:11.4
06:11.3	06:11.4	06:11.4
06:11.3	06:11.4	06:11.3
06:59.7	06:59.7	06:59.7

APPENDIX-M

Table 8. Raw data of Experimental group cardiovascular endurance

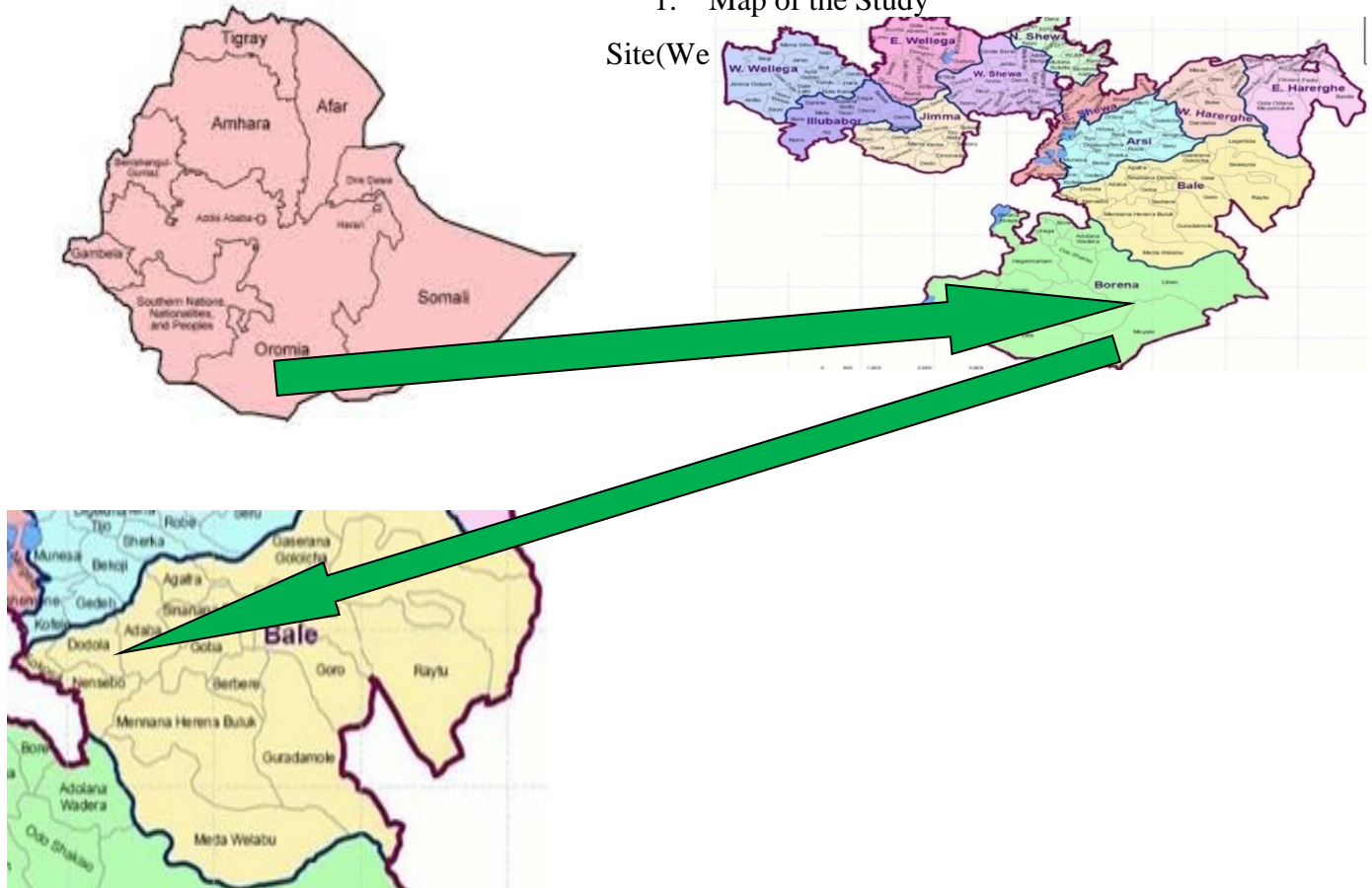
2.4km Pretest	2.4km During	2.4km Posttest
06:55.3	06:55.3	06:55.2
06:54.0	06:53.3	06:53.3
06:53.3	06:53.2	06:53.2
06:11.0	06:11.0	06:10.9
06:11.9	06:11.8	06:11.7
06:13.6	06:13.6	06:13.6
06:12.5	06:12.5	06:12.5
06:13.5	06:13.2	06:13.0
06:01.3	06:01.2	06:01.1
06:01.4	06:01.3	06:01.1
06:53.3	06:53.2	06:53.2
06:11.0	06:11.0	06:10.9
06:11.9	06:11.8	06:11.7
06:13.6	06:13.6	06:13.6
06:12.5	06:12.5	06:12.5

APPENDIX-N

List Of Figures In The Appendix

1. Map of the Study

Site(We



Source :westArsiAdministrativezone 2009 E.C

