

**EFFECTS OF TWELVE WEEK AEROBIC EXERCISE ON SELECTED
PHYSICAL FITNESS VARIABLES OF FERES BET GRADE TWELVE
MALE STUDENTS.**

MEd: THESIS

BY:

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**Effects of Twelve Week Aerobic Exercise on Selected Physical Fitness
Variables of Feres Bet Grade Twelve Male Students.**

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DEDICATION

I would like to dedicate this thesis to my mother, w/ro Mullu Mekonnen and my father ato Molla Simegn as well as my wife Emebet Tesfaye my sisters, brothers and friends who supported the accomplishment of my dream of receiving my master's degree. Without their tolerance, understanding, support and most of all love, the completion of this work would have been impossible. Furthermore, I could not have done this without the support of friends and Feres Bet participate

STATEMENT OF THE AUTHOR

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

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BIOGRAPHICAL SKETCH

The author was born in, West Gojjam Zone Degadamot Woreda From his Mother Mulu Mekonnen and his Father Molla Simegn on June 29, 1982 E.C in Gudiba Sekela Rular kebele . He attended his elementary education at feresbet Primary School in Feresbet town, his secondary school education at Feresbet Compressive School in Feresbet town and Preparatory School from 1999 up to 2003. In 2004, he joined Jimma University and graduated received a Bachelor science degree in Sport science in 2006.

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LIST OF ACRONYMS AND ABBREVIATIONS

ANRS	Amhara National Regional State
BMI	Body Mass Index
BPM	Beat per Minute
DHHS	Department of Health and Human Service
FITT	Frequency, Intensity, Time and Type of exercise
Kcal	Kilo Calorie
Kg/m²	Kilogram per Meter Square
MD	Mean Difference
MoE	Ministry Of Education
PoT	Post Test
PT	Pre Test
SD	Standard Deviation
SEM	Standard Error Mean
SPSS	Statistical Package for Social Sciences
VO₂max	Maximum Oxygen Consumption

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Effect of Twelve Week Aerobic Exercise on Selected Physical Fitness Variables in the Case of Feres Bet Grade Twelve Male Students.

Abstract

The purpose of this study was to investigate the effect of twelve weeks aerobic exercise on selected physical fitness variables and body age of Feres bet grade12 male students. Developing effective aerobic exercise program for students is a strategy for improving cardio respiratory fitness and body composition. The study was conducted on the effect of Twelve Week Aerobic Exercise on Selected Physical Fitness Variables. 32 male students whose age is 18-20 were selected by purposive sampling technique. The study employed Quasi-experimental research design.. Since the study was to investigate the effect of aerobic exercise on cardio respiratory fitness and body composition variables. The subject had participated in 3 sessions per week for 40 to 60 minutes per session of exercise training, which comprised as walking, jogging, running and rope skipping. The participants had taken pre and post-testing of cardio respiratory fitness was measured using 12 minute run and three minute step test, Body Composition was measured by using body mass index and body age Measured using resting heart beat. The data collected from the study subject was analyzed using SPSS version 20 software by paired t-test with level of significant 0.05. The results showed aerobic Exercise significantly improved cardio respiratory fitness, in the participants at ($p < 0.05$). Besides, there were significantly reduced body mass index at ($p < 0.05$). In case of body age, no significant change was observed in the participants. Based on this finding, it can be concluded that twelve weeks aerobic exercise has positive effect on improvement of cardio respiratory fitness and body composition variables. For better improvement of physical fitness, everyone should engage in aerobic exercise at least 3 days per week for 60 minutes each day..

Key words: - aerobic exercise, physical training, cardio respiratory, body composition, body

1. INTRODUCTION

1.1. Background of the study

Sport and exercise were always there from the very beginning of the history mankind. In the era of survival of the fittest the prehistoric man was able to understand the value of fitness by use of his intelligence, which was far superior to animals over which he ultimately dominated. When man was little civilized and sport become organized and competitive, professional advice for improvement of performance and the rising the level of safety become a felt need. With the advancement of civilization, sports begin apart of human life since ancient days, has undergone many changes. Earlier, it was played only the sheer joy and fun of participation (Layla, 2006).

Physical activity has significant physical health benefits; and it appears to improve health-related quality of life by enhancing psychological well-being and by improving physical functioning in persons compromised by poor health. (USDHHS, 1996) and it is positively associated with health related quality of life Berger&Motl, (2001).

Fitness s the ability of a person to live a full and balanced existence and it is considered as one of the most important health markers in childhood Ortega *teal.*(2008). Also has long been recognized as one of the primary objectives of physical education and sport. Wuest& Bucher, (1995).Further, physical fitness is a set of physical attributes that allows the body to respond or adapt to the demands and stress of physical effort.

Regular aerobic exercise produces beneficial effects for any age group providing the exercise is specific and appropriate to the level of fitness of the individual. Correctly performed Progressive exercise increases the level of fitness and improves health. It also creates 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 (Rosser, 2001).

Physical education has long and established tradition in schools being linked to with an Aristotelian concept of harmonious development of both body and mind. In other word, it is an important component of the overall school program and integral part of the educational program that contributes, primarily through physical activity experiences, to the total growth and Development of all students Pangrazi and Darst, (2002). As noted (Brubaker 2011) it provides students with many opportunities to improve their overall lifestyle; first and foremost, it provides students the opportunity to improve their physical fitness, development and health.

The reality in Fers bet secondary and preparatory school shows low time allotment of physical education than other subjects. Because of these students showed limitations on their physical fitness status when the researcher evaluates in his physical education practical classes particularly in grade 12 students.

1.2. Statement of the problem

Many studies believed that aerobic exercise can have miraculous health benefits on cardio respiratory and body composition improvement. However, it was expected that by the end of study Grade 12 students would have recognized the importance and choose to participate regularly in physical activities designed to maintain and enhance healthy lifestyles. Connecticut State Department of Education, (2009) and students want to be fit and active, but the opportunities offered in preparatory schools had been decreased in providing physical fitness lessons. In addition to this the time allocated to physical education in the majority of schools has declined with a consequent increase in time allocation for other academic subjects Hillman *et al.*, (2008).

As such, in Ethiopian secondary schools physical education curriculum developed one credit hour per week (40 minutes) for classroom as well as practical sessions. This is too little to improve the physical fitness components required to meet in the grade level with regard to set norms and standards of physical fitness at different age and sex levels. Many studies said that aerobic exercise are important for the development of all physical fitness qualities but no researches have done in Dega damot woreda especially students on their physical fitness problems. However, the improvement and development of physical fitness quality of students are the responsibility of every physical education teachers in the school. In this school there is lack

of awareness towards aerobic exercise. In this case the researcher has created awareness about the use of aerobic exercise on student's health. Due to this reason the investigator had testify the effect of three months of aerobic exercise which were given three days per a week on some selected physical fitness variables such as cardio respiratory endurance and body composition.

Based on the above reason the investigator had tested the following hypothesis:

1. H_1 . Twelve weeks aerobic exercises have significant effect on cardio respiratory fitness, of grade 12 male students.

H_0 Twelve week's aerobic exercise have no significant effect on cardio respiratory fitness, of grade 12 male students.

2. H_1 . Twelve weeks aerobic exercises have significant effect on body mass index, of grade 12 male students.

H_0 Twelve week's aerobic exercises have no significant effect on body mass index, of grade 12 male students

3. H_1 . Twelve weeks aerobic exercises have significant effect on body age, of grade 12 male students.

H_0 :- Twelve week's aerobics exercise have no significant effect on body age, of grade 12 male students.

1.3. Scope of the Study

This study would be delimited to the effect of twelve weeks aerobic exercise on selected physical fitness variables and delimited in the following areas.

- Subjects would be selected at Feresbet school grade 12 male students age ranged between 18 to 20 years. And healthy, untrained that has not any physical disabilities or medical conditions and volunteers to participate in this study.
- Only selected physical fitness variables such as cardio respiratory fitness which would be measure by using 12 minute run test and step test, body composition which would be measure by using BMI. And body age of student is focused. The intervention is Aerobic exercise running, walking, jogging and rope skipping exercises.

The time of training would be limited to three days per week and 40- 60minutes per sessions. The study would be conducted in the academic year of 2012 E.C/2020 G.C at first semester.

1.4. Significance of the Study

❖ This study would have the following significances.

- ✓ Helps to improve cardio respiratory fitness and body composition of students
- ✓ It motivates and encourages students to engage in aerobic exercise to boost their physical fitness.
- ✓ It provides meaning full information for students who involves on aerobic exercise program for the improvement of selected physical fitness variables.
- ✓ Help PE teachers to know further about the effect of aerobic exercise and the methods of evaluating students' physical fitness and Provide to assess and compare the performance of their students on schools.
- ✓ It will serve as an important resource for those who want to pursue similar studies.
- ✓ May give additional knowledge to area of research

1.5. Objective of the study

1.5.1 .General objective

The general objective of this study is to investigate the effect of twelve weeks aerobic exercise on selected physical fitness variables and body age of Feres bet grade12 male students.

1.5.2. Specific objectives

In addition to the general objective above, the research addressed the following specific objectives:

- To identify the effect of twelve weeks aerobic exercise on cardio respiratory fitness.
- To determine the effect of twelve weeks aerobic exercise on body mass index.
- To determine the effect of twelve weeks aerobic exercise on body age.

2. RELATED OF REVIEW LETRETURE

2.1 The Concept of Physical Fitness

Physical fitness to the human body is what fine-tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel our best. It is the ability to perform daily tasks vigorously and alertly with energy left over for enjoying leisure time activity and meeting emergency demands. (DestaEnyew, 2012).

American College of Sports Medicine has also defined physical fitness as a set of characteristics (i.e. the work capacity of heart and lungs, the strength and endurance of muscles and the flexibility of joints) that relate to the ability to perform physical activities Singh A. *et al.*, (1999). Physical fitness is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypo kinetic diseases or conditions, and meet emergency situation Corbin *et al.*, (2006). So, it is the basic requirement of life, which is achieved through participating in regular movement.

Although physical fitness is influenced by genetics and environmental factors, physical exercise is one of the main determinants Andersen, (2003). Physical educators classify physical fitness as skill related (related to sport performance) and health related fitness (associated with disease prevention and health promotion) which includes components such as cardio-respiratory endurance, muscular strength and muscular endurance, body composition and flexibility Hawley, (2001).

2.2. Health Related Fitness Components

Cardiovascular endurance, sometimes called cardio respiratory fitness, aerobic fitness, or aerobic capacity, is one of a health-related component of physical fitness that relates to ability of the circulatory and respiratory systems to supply oxygen during sustained physical activity (USDHHS, 1996). Cardio respiratory endurance is considered a critically important component of health related fitness because the functioning of the heart and lungs is so essential to overall wellness.

CVE is one of the most important measures of overall health. A person's level of cardiovascular endurance helps predict probability of disease, quality of life, 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)

A person simply cannot live very long or very well without a healthy heart. Low levels of cardio respiratory fitness are linked with heart disease. Cardio respiratory endurance is developed by activities that involve continuous rhythmic movements of large-muscle groups like those in the legs-for example, walking, jogging, cycling and aerobic dance. (Insel and Roth, 2002).

Cardio respiratory fitness is a component of fitness which is regarded as the basis of entire fitness. This is because of the various health advantages associated with the development of high levels of cardio respiratory endurance some of the benefits according to (Hockey 1981), Wilmore and Costill (1999), Brown *et al.*,(2002),(Sharkey 1990) and (Billman 2002) include increased efficiency in supplying oxygen, increased fat tolerance, increased coronary supply and capillary development, increased collateral circulation, reduction of obesity and overweight, reduced risks of heart diseases, strengthen bones, ligaments and tendons, reduced tension and stress, improved vitality, reduced fatigue, improved fat metabolism, enhanced self-confidence and body image and emotional stability.

The cardio respiratory systems are solely responsible for supplying oxygen (O₂) to the tissues and keep them from carbon dioxide (CO₂) and other waste products. Therefore, cardio respiratory endurance and fitness is essential to prolonged vigorous 16 activities. Having good cardio respiratory endurance is exemplified by such characteristics as the ability to run, cycle or swim for prolonged period of time, because of the importance of cardio respiratory fitness the (ACSM 1995) in (Heyward 1998) recommended that every physical fitness evaluation should include the assessment of cardio respiratory function during exercise and at rest.

V_{O2}max is an abbreviation for aerobic capacity. Aerobic capacity is the most important- area of any physical fitness program. Acceptable levels of aerobic capacity are associated with a reduced risk of high blood pressure, coronary heart disease, obesity, diabetes, some forms of cancer, and other health problems. Aerobic capacity is also commonly referred to as cardiovascular fitness, cardio respiratory fitness, aerobic fitness, aerobic work capacity, physical working capacity, and aerobic endurance Connecticut State Department of Education, (2009). Aerobic capacity

(VO₂max) reflects the maximum rate that oxygen can be taken up and utilized by the body during exercise. The magnitude of VO₂max depends on the capacity of the lungs to exchange oxygen between the air and blood in lung capillaries, the capacity of the cardiovascular system to transport oxygen to the muscles, and the muscles' capacity to use oxygen. The highest rate of oxygen uptake and use reflects the upper limit in the ability of the body to supply energy via aerobic metabolism to the active muscles during strenuous exercise. Aerobic capacity is most commonly expressed relative to body weight to account for differences in body size and to reflect a person's ability to carry out weight-bearing tasks Welk and Meredith, (2008).

Many terms have been used to describe this dimension of physical fitness, including cardiovascular fitness, cardio respiratory fitness, cardio respiratory endurance, aerobic fitness, maximal aerobic power, aerobic work capacity, and physical work capacity. For all practical purposes, these terms are used interchangeably. A subtle distinction is that cardio respiratory endurance, aerobic work capacity, and physical work capacity are typically used to refer to performance ability (the capacity to perform large-muscle activity for a prolonged period of time), whereas aerobic capacity refers to a functional (physiological) capacity. Because the underlying functional capacity is the construct of most interest in relation to health, and because field tests are actually validated against VO₂max measured in the laboratory.

2.3. Aerobic Exercise

Aerobic exercise is physical exercise of relatively low intensity that depends primarily on the aerobic energy-generating process. Aerobic literally means “living in air”, 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. Aerobic exercises are a wonderful way to burn your fat and tone your body muscles, leaving you healthy and in a good shape. Finding the perfect Workout Routines takes time and effort. These best workout routines is a great place to start if a person is interested in flat abs. All these activities are healthy, easier to perform and inexpensive. Aerobic exercises are beneficial in so many ways like strengthening the respiratory muscles, strengthening and enlarge the heart muscle and improve its pumping, improving blood circulation and red blood cells, reducing stress and depression, increasing your

stamina and endurance of your muscles. In short it reduces the risk of heart attacks. International Journal of Physical Education, Sports and Health, (2015)

According to (Braun, et al 2013), and (DHHS 2013), aerobic exercise can help to feel better and enjoy life to the fullest in the following way: -

Keep excess pounds at bay: - Combined with a healthy diet, aerobic exercise helps to lose weight and keep it off.

Increase stamina: - aerobic exercise may make tired in the short term. But over the long term, you will enjoy increased stamina and reduced fatigue.

Ward off viral illnesses: - Aerobic exercise may activate immune system. This may leave less susceptible to minor viral illnesses, such as colds and flu.

Reduce health risks: - Aerobic exercise reduces the risk of many conditions, including obesity, heart disease, high blood pressure, type two diabetes, metabolic syndrome, stroke and certain types of cancer. Weight bearing aerobic exercises, such as walking reduces the risk of osteoporosis.

Stay active and independent as you age: - Aerobic exercise keeps muscles strong, which can help to maintain mobility as you get older.

Strengthen heart: - A stronger heart doesn't need to beat as fast. A stronger heart also pumps blood more efficiently, which improves blood flow to all parts of the body.

2.1.1. Types of aerobic exercise

Any activity that uses large muscle groups, can be maintained continuously, and is rhythmical in nature can be regarded as an aerobic exercise. In general, aerobic exercises requiring little skill to perform are more commonly recommended for all adults to improve fitness. Aerobic exercises that require minimal skills and can be easily modified to accommodate individual physical fitness levels include brisk walking, leisure cycling, swimming, and aqua-aerobics and slow dancing. Aerobic exercises that are typically performed at a higher intensity and, therefore, are recommended for persons who exercise regularly include jogging, running, aerobics, stepping exercise, fast dancing and elliptical exercise. These exercises should be performed with the recommended dosage of aerobic exercise which means, (frequency (F), intensity (I) and duration (time, T) of the exercise performed. In combination with the type (T) of exercise performed, these factors constitute the basic components of the core principle of exercise prescription (the

FITT principle). It should be noted that even small increases in caloric expenditure with physical activity may improve physical fitness outcomes. (General principles of exercise prescription 4thed)

2.2.2. Effects of aerobic exercise

There are many studies done on the effect of aerobic exercise training on physical fitness. To name a few: (Mr.MathewosHosiso, Dr.Sangeeta Rani, Dr.ShemelisMekoninne, 2013) studied on the effect of aerobic exercise on improving health related physical fitness components of Dilla University sedentary female community. The objective of this study was to investigate the effect of aerobic exercise on improving health related physical fitness components of Dilla University sedentary female community. The result obtained in this study indicated that there were significant improvement in cardiovascular endurance, muscular endurance, muscular strength and flexibility but in the case of body mass index and body weight there were reduction. Based on this finding, the researcher concluded that Moderate aerobic exercise has positive effect on improvement of health related physical fitness components of sedentary female communities.

Another finding by Toy, (2008) conducted on the effect of aerobic dance training on Vo2 Max and Body Composition in early middle aged Women. The result of this finding showed that there were significant reductions in body weight, BMI, body fat percentage, and in vo2 max. This study indicates that aerobic dance training increases the physical and cardio respiratory fitness among middle aged women.

Further, Mahendran (2009) conducted a research on the effect of 12 weeks aerobic exercises on selected health related physical fitness and physiological variables among adolescents. Selected health related variables were, muscular strength measured using hand grip dynamometer, muscular endurance measured using bent knee sit ups, cardio-respiratory endurance measured using 12-minutes run/walk, flexibility measured with sit and reach box. Body mass index measured using height and body weight. This finding proved that all variables were significantly improved among experimental group.

2.2.3. Effects of Aerobic Exercise on Body Composition

Regular aerobic exercises reduce the body fat percentage without the loss of the muscle as well as important effect on anthropometric and hematologic level of obese and overweight women (Evrimet al., 2010). Aerobic exercise including walking, running, and swimming has been proven to be an effective way to lose weight; Body Composition Changes for over fat or borderline over fat people, regular aerobic exercise reduces body mass and body fat. Increases in fat free body mass also accompany a regular program of resistance training. Katch *et al.* (2011). EverimCakmak, et al. (2006) investigated on the effects of aerobic dance exercise on body composition changes associated with weight change in sedentary women. The purpose of this study was to evaluate the effects of aerobic dance on body composition in sedentary overweight women. From this study significant differences between pretest and posttest for weight, body mass index, waist circumference, waist hip ratio, metabolic and body composition parameters in exercise group ($p < 0,05$) were observed in experimental group. The other variables, body weight, Lean Body Mass, Basal Metabolic Rate and body fat percentage were significantly decreased ($p < 0,05$). But in control group there were no significant differences between pretest and posttest results in any either variable. Thus the researcher concluded that aerobic dance exercise can improve physical fitness and can decrease body fat percentage, Lean Body Mass and Basal Metabolic Rate.

Further, DrFatmaArslan (2011) conducted research on the effects of an eight-week step-aerobic dance exercise programme on body composition parameters in middle-aged sedentary obese women. The Results showed significant differences were observed in the subjects' weight, BMI, body composition parameters, waist-hip ratio, waist circumference, fat percentage, lean body mass and basal metabolic rate in the experimental group ($p < 0.05$). But no significant differences were found in the control group ($P > 0.05$). Thus it can be said that, step aerobic dance program me proved to be the best exercise modality for weight loss.

2.2.4. Aerobic Exercise on Cardio Respiratory Fitness

As Corbett, (2009) wrote, a person's level of cardiovascular endurance helps predict probability of disease, quality of life, and ability to react to acute physical and mental stress. For healthy individuals, higher cardiovascular endurance also indicates an elevated level of physical fitness. Many studies indicate that cardio Respiratory fitness improved after aerobic exercise. Lexie, D

Williams, et al. (2008) investigated a research on Changes in selected cardio respiratory responses to exercise and in body composition following a 12-week aerobic dance program. These finding showed that significant improvements were observed in O₂ pulse, heart rate and perceived exertion during sub maximal exercise. VO₂ max, maximal O₂ pulse, maximal heart rate and maximal running time on the treadmill were also showed significant improvements as a result of 12-week aerobic dance program. Additionally, an increased lean body mass and decreased body fat percentage and the sum of four skin fold thicknesses were found to be significant for the experimental group. But in case of control group no significant improvements in any of these variables were observed. From this finding the researcher concluded that cardio respiratory fitness and body composition were successfully changed after 12-weeks of aerobic dance program.

John P. Porcari, et al. (2009) also conducted a research on effects of a 10-week step aerobics training program on the aerobic power and body composition of college-age women. The objective of this study was to determine the effect of a 10-week step aerobics training program on aerobic power and body composition of college-age women. Subjects in the experimental group exercised three times per week for 10 weeks while control group did not exercise. From this finding a significant ($p \leq 0.05$) improvement were observed in peak oxygen consumption, maximal minute ventilation, and time to exhaustion on the treadmill in experimental group Compared with the control group. But in case of body fat percentage there was no significant ($p > 0.05$) change in either group. Thus, the researcher highlighted that step aerobics training is an effective method of improving aerobic power in college-age women. But body composition was not positively affected due to the in adequacy of the duration and frequency of training used in the current study.

Partavi, (2013) also conducted a study on the effects of a 7 week of rope-jump training on speed, endurance and agility in middle school male students. From this finding the researcher concluded that 7 weeks rope jump training is an effective method for improving cardio Respiratory fitness and agility in middle school student boys. Generally, various studies showed aerobic exercise causes positive change in the body's cardio respiratory system. During maximum aerobic exercise the trained individual has increased maximum oxygen consumption and is better able to process oxygen and fuel can provide more energy to working muscle. (Probart et al., 1991)

2.3. Benefit of Aerobic Exercise

Lifestyle plays an essential part in maintaining long-term cardiovascular health. A healthy diet, moderate drinking, not smoking and plenty of exercise can all help to maintain a healthy cardiovascular system. Inactivity is one of the major risk factors for heart disease and exercise helps improve heart health and can even reverse some heart disease risk factors. Dr Kelly & Associates, 1989, noted that aerobic exercise produces beneficial effect on human bodies by strengthening the muscles involved in respiration, improving circulation efficiency and reducing blood pressure, reducing body fat, reduced stress and preventing health problems.

In addition, aerobic exercise has various effects on human body including, reduced cholesterol and blood pressure, improved muscular endurance, reduced body fat, increased metabolism, strengthen heart and lungs, and improved quality and quantity of life. Exercise not only extends your life, but also gives you more energy to live it to the fullest. Aerobic exercise improves the strength of bones, ligaments and tendons, allows body to use fats and sugars more efficiently, burn lots of calories and plays an important role in reducing the onset and symptoms of aging and illness. Aerobic exercise reduces risk of heart disease, vascular disease and diabetes and can help those trying to quit smoking by relieving cravings and improving lung function. Kathleen, (2006).

2.4. Body composition

It refers to the proportion of fat and fat free mass (muscle, bone, and water) in the body. Having too much body fat has negative health consequences, like heart disease, high blood pressure, stroke, joint problems, diabetes, gallbladder disease, some type of cancer and back pain. Obese people have an overall mortality rate almost twice that of non-obese people. Obesity is associated with unhealthy blood fat level, impaired heart function, death from cardio vascular disease. (Fit and well fifth edition)

The Body Mass Index, which is commonly referred to as the BMI, is not an estimate of body fat. Instead, it provides information on the appropriateness of a student's weight relative to his or her height.

The Body Mass Index is not the recommended body composition test particularly for some students with high muscle mass California Department of Education, (2011).

The BMI is computed with the following equation

$$\text{BMI} = \frac{\text{Weight in Kilograms}}{(\text{Height in meters})^2}$$

2.5. Information on body composition

As noted in Omron health care 2008, BIA measures the following information.

Body Mass Index (BMI):-is a number calculated from a person's weight and height. BMI is a reliable indicator of body fatness for people

2.6. Body age

Body age is based on your resting metabolism. Body age is a measurement of how old we are biologically based up on our health and fitness level as opposed to what our birth certificate indicates. Additionally, exercise can increase our body age. The indications are the strength of our different body muscle that we have gets after vulnerability of our body for prolonged period of exercise. The risks of exercise in the aging population are more pronounced with individuals who have pre-existing cardiovascular disease or cardiac problems, chronic obstructive pulmonary disease (emphysema, asthma, chronic bronchitis), deleterious osteoporosis and arthritis, and uncontrolled metabolic problems (unmanaged diabetes) (Kligman & Pepin, 1992) . Kligman and Pepin also suggest that for the most part, an exercise prescription is appropriate for apparently healthy seniors, even if there is diminished flexibility and functional capacity due to a sedentary lifestyle.

If you think taking a couple of inches off your waist would feel good, just imagine how great you would feel after taking a few years off your body age. The good news is that your body age can be reduced!

In fact, your obtainable body age may very well be below your chronological age. By improving your overall fitness level and reaching your obtainable body age, it could possibly help you to live longer and feel younger. Since the 1960's the growth of the U.S. population aged over 65 has been twice that of the general population. By the year 2000, the number of men and women over age 65 in the U.S. is projected to increase to 32 million people, which will be approximately 20% of the population. The old-old population, those over the age of 75, is actually increasing the fastest. A lack of exercise during adult life is associated with reconditioning, fatigue, weakness, decrease in one's physical and mental health and well-being, the onset of disease, loss of self-esteem and self-efficacy, and an increase in depression and anxiety. The one intervention proposed to have the most eminent preventative and therapeutic impact on these age-related changes is physical activity. Physical activity for the elderly needs to take into account the individual's health status, fitness level and age. The relationship of these variables is very complex and variable to a number of factors. Therefore, the health fitness specialist should not view the elderly as being one homogeneous group. Although different terms are used in the literature, gerontologists have identified three broad categories of seniors: 1) old-old or frail old, who are over 75 years of age, 2) young-old who are persons between 65 and 75 years, and 3) athletic-old, elders who have maintained a high level of fitness throughout their life (Elia, 1991). This article will examine the relationship of exercise as it relates to changes with aging and provide guidelines for the health fitness professional in working with this spirited population.

3. MATERIAL AND METHODS

3.1 Description of the Study Area

The study was conducted in Feres bet grade 12th students, in Degadamot woreda of West Gojjam Zone, Amhara National Regional state (ANRS). Dega Damot is one of the 105 woredas in the Amhara Region. It has a total area of 831.23 square kilometers. It is part of the West Gojjam Zone which is bordered on the south by Dembecha, on the southwest by Jabi Tehinan, on the west by Quarit, on the north and east by the Misraq Gojjam Zone. The woreda is divided into 31 rural and 2 urban kebeles. The major town of Dega Damot woreda is Feres Bet. Feresbet, is located about 412Km from Addis Ababa in the Northern direction. Feresbet is located at latitude and longitude of 10°31'60"N, 39°31'10"E respectively, and an elevation of 2724m above sea level. The area of the town is about 7.75 km² which has been subdivided into 2 urban *Keble's* administrations and there are around 17087 people living in there (SCA, 2011).

3.2. Experimental Materials

For the success of the study necessary materials and facilities such as cones, corner flags, stop watch, whistle, record sheets, measuring tape (meter) paper and step up bench were used.

3.3. Source of Data

The researcher were used primary data that is obtained from the subjects using fitness tests, (pre, and post) field works and experimental variables according to the designed procedures, and quantitative data collection method to collect data from the subjects, by using pre-test, and post-test through the appropriate physical fitness tests.

3.4. Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2004). Depending upon the nature and appropriateness of the pretest and post test data the research approach designed in this study would be quasi experimental method.

The layout for this study was pre post test on selected physical fitness variables such as cardiovascular endurance and body composition were administered for selected subject.

For the study the researcher has spent 12 weeks physical fitness training with a session of three days per a week and 40- 60 minutes per day. The selected participants was engaged in regular exercise program for effect twelve weeks such as warming up, stretching, rope skipping, walking, jogging, and cooling dawn aerobic exercise the independent variable on the dependent variables; these are cardio vascular fitness and body composition. The layout for this study was as follows:

Table 1 the Study design lay out

Treatment	Aerobic exercise
Frequency	3 days/week
Total duration	12 weeks
Duration/Session	40-60 minutes
Intensity	Moderate
Exercise days	Tuesday, Thursday , Saturday
Time of training	Afternoon5:00-6:00pm

3.5. Population of the study

The populations of the study were Feres bet grade 12 male students. Since the research was experimental to monitor training as well as manage the test administrations and data analysis only 32 male sample students had been selected from a total population of 124 male students.

3.6. Sample size and Sampling Technique

Sample of this study were contain 32 male participants from the total number of 124 grade 12 male students whose age was between 18-20 years old. For this Study the investigator was used purposive sampling technique to select the sample size of the participants. The school had a total number of 124 male grade 12th students. From these 43 students were above the age of 20 years old and from the rest 81 students 23 of them were neglected due to the medical history by questionnaires and criteria, and 26 male students(9 football project players, 7 athletics project athletes and 10 of the students) were not interested. Thirty two male students were only interested and selected by purposive sampling method whose age was 18 to 20. For the

participants' Medical check up was conducted at Fersebet clinic. Since all the students attended in this study were from their respective homes, therefore diet control phase was not possible.

3.7. Inclusion Criteria

A Subject who fulfill the health status questionnaire and whose age is 18-20 male students, who didn't formal exercise or sport exercise were included in this study.

3.8. Exclusion Criteria

From the subjects whose medical condition was restricted by doctor, having any recent physical injury and whose age was above 20 and below 18 male students were not included in this study, since there was no student whose age is below 18 as a grade 12 students. . In addition to this, individuals who were participated in other sport programs and non interested students were not included in this study.

3.9. Data collection Instruments

In order to collect the data necessary for analysis, the researcher would be used physical fitness tests measurements of selected physical fitness variables. Like, step test and 12 minute run test for cardiovascular endurance, body mass index for body composition and radial artery and carotid artery for resting heart beat to determine body age.

3.10. Data collection procedures

The researcher was prepared three months training program for three days per week, 40-60 minute per day with moderate-high intensity exercise. And would collected trainee's pre-test result before the beginning of 12 weeks physical fitness training and post-test result after 12 weeks fitness training and would recorded the result by using record sheet.

3.11. Procedures for administration of fitness tests

3.11. 1. Test for Cardio Respiratory Fitness

3.11.1.1. Cooper's 12 minute run test

Cooper's 12 minute run test Cooper, (1968) is a popular field test used for measuring aerobic fitness. This fitness test is initially used to estimate the VO₂ max. Dr. Cooper found that there is a very high correlation between the distance someone can run (or walk) in 12 minutes and their VO₂ max value, which measure the efficiency with which someone can use oxygen while exercising. Students are familiar with the 12 minute run/walk test protocol prior to the pre-testing date. This is measuring the distance covered in twelve minutes, involves running for twelve minutes around the 400 meter track marked out area and register how far covered in that time with the nearest 50 meters. The purpose of the distance runs is to measure maximal functional capacity and endurance of the cardio respiratory system. Subjects are instructed to run as far as possible in twelve minutes. The students are conducted a warm up for five minutes. The students began on the signal, "Ready, start." Participants are continued to run until a whistle is blown at twelve minutes. Walking was permitted, but the objective was to cover as much distance as possible during the twelve minutes. After completing the test the distance covered was registered near to 50m. Required equipment includes stopwatch or wrist watch, 400m track-marked every 50m, assistance and data recording forms.

3.11. 2. Step test

The objective of this test is to monitor the development of the athlete's cardio vascular systems.

Required resources

To undertake this test you will required:

12 inch high bench or step

Stop watch

Assistant

How to conduct the test

The step is conducted as follows:

- ✓ Use metronome or have some to help you keep to the required space
- ✓ Try to maintain a steady four cycle (approximate 22 to 24 steps/minute)
- ✓ Step up and down ,one at a time , on to the step or bench for 3 minute
- ✓ On finishing the test count the number of heart beats for 15 seconds
- ✓ Multiply the number of beats in 15 second by 4.

The scoring is the number of heart beats per minutes, measured for one minute after completion of the step test.

Step test is designed to measure cardiovascular endurance by using a 12 inch high bench (or a similar sized stair or sturdy box), watch for timing minutes. The step test works on the rational that individuals with a high level of cardio respiratory fitness will have a lower heart rate during recovery from three minutes of standardized exercise (bench stepping) than less conditioned individuals. The lower heart rate after the test will be an indicator for being the fitter Golding *et al*, (1986). The heart rate of a person who is physically fit increases less with exercise and recovers faster than does a person who is not physically fit. The objective of the test is to measure the recovery rate of heart after exercise.

3.11. 3.Test for Body mass index (BMI)

BMI is a ratio of the total body weight to height. Several ratios have been proposed, but the one used most frequently is weight (in kilograms) divided by height (in meters) squared [WT/HT^2 Kg.m²]. This ratio is also known as the Quetelet index Brodie,(1988,) Revicki and Israel,(1986),Satwanti, (1980) The objective of this test is to monitor the athlete's weight.

Required resources

To undertake this test it requires:

- Tape measure to determine your height
- Set of scales to measure your weight
- Assistant.

How to conduct the test

Assistant to:

- Measure the athlete's weight in kilograms.
- Measure the athlete's height in meters.
- To determine BMI divide the weight by the height squared:

3.11.4 Test of body age

Body age is a measurement of how old we are biologically based up on our health and fitness level as opposed to what our birth certificate indicates. Additionally, exercise can increase our body age. The indications are the strength of our different body muscle that we have gets after vulnerability of our body for prolonged period of exercise.

To undertake this test you will require:

- Resting heart beat of the participants
- Age of participants

How to conduct the test

We found body age based on the following mechanism for participants. Actually the numbers are not similar because 2 and 4, 3 and 5's heart beat numbers are quite different.

1. Body age=normal age-4 when heart beat is between 54-59
2. Body age=normal age-2 when heart beat is between 60-64
3. Body age=normal age-1 when heart beat is between 65-72
4. Body age=normal age-2 when heart beat is between 73-76
5. Body age=normal age-1 when heart beat is above 77

Source: <http://www.capitalfm.co.ke>

3.12. Methods of Data Analysis

The collected data would be analyzed through statistical package for social science software (SPSS version20.0) using quantitative and descriptive statistics such as mean, standard deviation, paired-sample t-test used to compare the mean difference between pre-test and post-tests results of cardiovascular fitness and body composition.

3.13. Data Quality control

In this study the standardized physical test would be used to control the quality of the data. In addition to this the data recorder would be collected the data accurately and attentively to reduce mistakes by using appropriate measurement materials. In order to decrease common errors in physical fitness test measurements, care would be taken and properly supervised during procedure of, cooper test, step test and measurement of BMI would be recorded. The physical fitness test would be recorded with video and photograph for further evidence on the test procedure. In addition to this the standard procedure for measurement of test would be used to gather the data from the subject and to minimize common errors during fitness test. The researcher got the actual age of the students by asking them individually.

3.14. Ethical consideration

This study deals with the ethnical issue related to the investigation. All action depend on the school rule, code of conduct and policy concerning to research ethics. Therefore the study would be conducted after the informed consent of school director and staff members. Ethical standards require that researcher should not imposed participants in a situation where they might be risk at of physical harm as a result of their participation. All of the participants would have clear information about the purpose of the study and give signed agreement to participate in this study.

4. RESULTS AND DISCUSSIONS

4.1. Introduction

This part of the study deals with presenting, analyzing and discussing the data collected through pretest, and post test results of cardiovascular endurance and body mass index for individual students from Experiment. The researcher had used the quantitative research method.

The purpose of this study was to find out the Effect of Twelve Week Aerobic Exercise on Selected Physical Fitness Variables in the Case of Feres Bet Grade Twelve Male Students in Degadamot Woreda, West Gojjam Zone, Amhara Regional State, Ethiopia. To achieve the purpose of the study 32 male students were selected as subjects and their age was 18-20 years. Aerobic exercise was given for 12 consecutive weeks. The variables selected for this study were health related physical fitness components such as cardiovascular endurance and body composition. Pre and post test were conducted for all the 32 subjects on health related physical fitness components and the scores were recorded. The collected data were analyzed by t-test by using SPSS. The results for each fitness variables are discussed below.

4.2. Results of the Study

4.2.1. Characteristics of study participants and physical fitness variables

To conduct this study valuable data was collected from the study participants. The participants of the study were grade 12 male students. The participants were asked to indicate their personal profile. Therefore, in this section the data that obtained from respondents regarding their personal profile were presented in the following table.

Table 2 Characteristics of the study participants

Group	N	Age		Height		Weight	
		Mean	S.D	Mean	S.D	Mean	S.D
Experimental Group or participants of the study	32	19.16	.808	1.6331	.05538	54.88	3.087

MD=Mean Difference, SD= Standard deviation EG = experimental group

As shown from above Table 1 Descriptive characteristics of 32 study participants from Feresbet preparatory school mean of age (19.16), height (1.6331) and weight (54.88). Subjects were relatively had the same age, height and weight at the beginning of aerobic exercise.

Table 3 Paired sample statistics of 12 minute run test, step test and body mass index test

Subjects						
Test	Participants of the study					
	Mean		Std. Deviation		Std. Error Mean	
	Pre test	Post test	Pre Test	Post Test	Pre test	Post test
12minute run test	2703.44	3408.12	176.482	206.013	31.198	36.418
3 minute step test (bpm)	104.59	79.56	11.290	10.767	1.996	1.903
BMI test in kg/m ²	20.5669	19.5600	1.29598	1.17940	.22910	.20849
Body age	17.94	18.16	.840	.808	.148	.143

BMI= body mass index, kg/m²= kilogram per meter square and bpm =beat per minute.

As shown the above table the paired sample statistics results of pre – post test of the experiment, comparison before and after 12 week training programs, the pre test and post test were compared the level of 12 minute run test performance. Accordingly, the outcome, the mean value of pre test was found to be 2703.44 meter with SD= 176.482 and Std. Error Mean 31.198. The mean value of post test was found to be 3408.12 meter with SD=206.013 and Std. Error Mean 36.418. At the level of 3 minute step test performance, the outcome, the mean value of pre test was found to be 104.59 beat per minute with SD =11.290 and Std. Error Mean1.996. The mean value of post test was found to be79.56 with SD =10.767 and Std. Error Mean 1.903. At the level of body mass index test performance, the outcome, the mean value of pre test was found to be 20.5669 kg/m² with SD =1.29598 and Std. Error Mean .22910. The mean values of post test were found to be 19.5600 kg/m² with SD=1.17940 and Std. Error Mean .20849. Those each test protocol

indicated that, there were mean difference between the pre and post tests of the experimental group. Yet, it is impossible to tell here if the differences are statistically significant. Hence a paired sample t-test comparing the pre test and post test scores of within the group and which was computed to examine whether those number show statistical difference for each test protocol level of male grade 12th students, the t- test results presented in the table above.

Similarly, the above table shows that the mean value of body age of participants' pre and post test is very close. As shown in the table, the pre and post test of body age were found to be 17.94 and 18.16 with a standard deviation of .840 and .808 and Std. Error Mean of 0.148 and 0.143 respectively.

4.3. General Mean comparison of cardiovascular and body composition variable

During the 12 weeks of aerobic exercise training, the improvement of subjects performance were greatly increased from pre training to post training in experimental groups . This improvement shows that aerobic exercise had a great effect on the improvement of cardio respiratory fitness and body composition. Mean value difference between pre and post tests of the groups were discussed as follows. Paired t-test was computed to examine whether the result had statistically significant at the pre and post test.

Table 4 Comparison result of cardiovascular and body composition variables for the participant's pre and post test

Variables	Paired Differences					T	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
				Lower	Upper		
12 minute run pre test - 12 minute run post test	-704.688	78.329	13.847	-732.928	-676.447	-50.892	.000
3 minute step test pre test - 3 minute step test post test	25.031	5.379	.951	23.092	26.971	26.324	.000
BMI pre test - BMI post test	1.00688	.30000	.05303	.89871	1.11504	18.986	.000
Body age pre test- body age post test	-.219	.420	.074	-.370	-.067	-2.946	.06

BMI= Body mass index

The above table shows the test significance differences of the participants' pre and post test results. According to the data presented in the above table, the pre and post test result of cardio respiratory fitness performance levels in 12minute run test showed a statistically significant difference in the study participants. The result suggests that participants were significantly improved cardio respiratory fitness (MD =-704.688, SD =78.329, p = 0.000) as a result of 12 weeks aerobic exercise. Hence, (P <0.05) Post-training cardio respiratory fitness was significantly improved in 12minute run test than pre-test values. In the former table 2 it was indicated that the mean score of 12 minute run test after giving aerobic exercise was higher than that of before giving aerobic exercise. The mean value for the participants 12 minute run test before training was 2703.44and it increased to3408.12after aerobic exercise. Between each tests, the mean value difference was 704.68. This value showed that the performances of the participants were significantly increased from pre-post tests. This indicates that twelve weeks aerobic exercise could have a great effect on the improvement of Cardio respiratory fitness.

The above table also displays the test of significance differences of the participants' pre and post test results of three minute step test. According to the data presented in the table, the pre and post test result of cardio respiratory fitness performance levels in 3 minute step test showed a

statistically significant difference ($MD = 25.031$, $SD = 5.379$, $p = 0.000$). Hence, ($P < 0.05$) post test heart rate was significantly lowered than pre test for the participants. In the former table 2 it was showed that the mean score of three minute step test after giving aerobic exercise was lower than that of before giving aerobic exercise. The mean value of three minute step test 104.59 was before aerobic exercise and it lowered to 79.56 after aerobic exercise. Between each, the mean value difference was 24.97. These values showed that the heart beat of the participants were significantly lowered from pre-post tests. From this we can understand that regular aerobic exercise may affect cardio respiratory fitness positively. Furthermore, it results in lowered heart rate.

The above table also displays the comparison of BMI result of the participants' pre and post test. According to the data presented in the table, the pre and post test result of BMI showed a statistically significant reduction ($MD = 1.00688$, $SD = .30000$, $p = 0.000$). There were a significant BMI reduction ($P < 0.05$) in the participants after the aerobic exercise program were given. In table 2 it was indicated that the mean score of the participants BMI after giving aerobic exercise was reduced than that of before giving aerobic exercise. The mean values of the participants' were 20.5669 before aerobic exercise and it reduced to 19.5600 after aerobic exercise. Between each, the mean value difference was 1.0069 reductions for the participants. This indicates that twelve weeks aerobic exercise has an impact on the reduction of BMI.

Table above shows the comparison of body age result of the participants' pre and post test. According to the data presented in table 2, the pre and post test result of the participants showed no significant difference. The result suggests that no significant change was found in body age of the participants ($MD = 0.219$, $SD = 0.420$, $p = 0.06$) when exposed to 12 weeks aerobic exercise. Hence, the test was not significant at 0.05 level of confidence in the participants. In the former table 2 it was showed that the mean score of the participants' were 17.94 and 18.16 pre and post test respectively. The mean difference as can be shown in the table above is 0.219 increments in the participants. From this we can understand that twelve weeks aerobic exercise had no an impact on body age.

4.3. Discussions

The purpose of this study was to investigate the effect of 12 week aerobic exercise on selected health related physical fitness variables of grade twelve male students at feresbet grade 12 students. Participating in aerobic exercise regularly has significant positive effects on the overall health and wellbeing of individuals which improves cardio respiratory fitness and body composition (American College of Sport medicine 2010). Regular aerobic exercise will also produce beneficial effects for any age group providing the exercise is specific and appropriate to the level of fitness of the individual (Rosser, 2001). Aerobic exercise plays a vital role in preventing cardio vascular disease, reducing body fat and improving circulatory efficiency (Dr Kelly and associates, 1989). In this study aerobic exercise training showed improvements in health related physical fitness variables of cardio respiratory fitness and body composition. The finding of this study in each variable are discussed as follows.

In case of cardio respiratory fitness, there was significant difference in between the pre and post test scores of the participants in 12 minute run test. The result suggests that the participants significantly improved cardio respiratory fitness (MD = -704.688, SD = 78.329, $p = 0.000$), significant at 0.05 level of confidence. The improvement of the participants in performance was due to the aerobic exercise in which they were engaged in. When we compare the mean score of the participants before aerobic exercise with the mean score of after 12 weeks aerobic exercise, the mean difference value increased by 704.688. This result indicated that effective change was observed on students who engaged in twelve weeks aerobic exercise cardio respiratory fitness level. So, the formulated hypothesis that twelve weeks aerobic exercise would have significant effect on cardio respiratory fitness of students were accepted at 0.05 level of confidence when assessed in 12minute run test.

Cardio respiratory fitness also showed improvement in the participants when assessed in three minute step test. As proved in table 3,EG significantly improved cardio respiratory fitness in three minute step test (MD = 25.031, SD = 5.379, $p = 0.000$), significant at 0.05 level of confidence. This also suggests that twelve weeks aerobic exercise may affect cardio respiratory fitness, so the formulated hypothesis that twelve weeks aerobic exercise would have significant effect on cardio respiratory fitness of students were accepted at 0.05 level of confidence when assessed in three minute step test. This indicates that aerobic exercise program proved to be a

useful exercise modality for improving cardio respiratory fitness. This result was in agreement with the findings of Mahendran, (2009) that conducted with selected health related variable cardio respiratory endurance was measured using 12-minutes run test. The variable was significantly ($p < 0.05$) improved the participants. This finding is also in accordance with Lexie, D Williams, et al. (2008) who's finding on the effects of a 12 week aerobic dance program on cardio respiratory response showed significantly lowered heart rate after aerobic exercise. The result also supported by Partavi, (2013) who discovered that after seven weeks of rope jumping training a significant ($p < 0.05$) improvement in cardio respiratory fitness was observed among experimental groups of middle school student boys. In the case of control group no significant changes were seen in any of the selected studies.

In case of Body Mass Index (BMI), there was significant BMI reduction in between the pre to post test result of the participants. The result suggests that the participants were significantly reduced BMI (MD = 1.00688, SD= 0.30000, $p= 0.000$), significant at 0.05 level of confidence. When we compare the mean score of the participants before aerobic exercise with the mean score of after 12 weeks aerobic exercise, the mean difference value reduced by 1.0069. This indicates that aerobic exercise including walking, jogging and running has been proved to be an effective way to lose weight through metabolizing fats in energy generating of working muscles by increasing calorie expenditures. In similar with this result, the formulated hypothesis 2 stated that Twelve weeks aerobic exercise would have significant effect on body mass index of students were accepted at 0.05 level of confidence.

This result was in agreement with the findings of Everim Cakmak, et al. (2006) whose result on pre and post tests of BMI of grade 12 male students showed significant change after 12 weeks aerobic exercise ($p < 0.05$).

Another finding by Mr. Mathewos Hosiso, Dr. Sangeeta Rani, Dr. Shemelis Mekoninne, (2013) who studied on the effect of aerobic exercise on improving health related physical fitness components of Dilla University sedentary female community supports this result. This study proved that aerobic exercise including walking, running, and swimming has been proven to be an effective way to lose weight and body fat. This finding is also in accordance with Dr. Fatma Arslan (2011) whose finding on the effects of an eight-week step-aerobic dance exercise program on body composition showed significant differences were observed in the subjects' BMI ($p < 0.05$).

In case of body age, the data (table 3) showed that there were no significance differences before and after 12 weeks of aerobic exercise on student's body age. The result suggests that no significant change of body age were found in the participants (MD = 0.22, SD= 0.420, p= 0.006), no significant at 0.05 level of confidence. The mean difference 0.22 existed this much difference between the pre to post test of body age in the participants. In other words, they did not show any difference as a result of twelve weeks aerobic exercise. Hence, this finding proved that, twelve weeks aerobic exercise had no impact on body age of students. The reason behind this may be the duration and frequency of aerobic exercise used in the current study may not be adequate to affect body age positively. Therefore, the formulated hypothesis 3 stated Twelve weeks aerobic exercise would have significant effect on body age of students were rejected at 0.05 level of confidence.

The result is also supported by Ozcan Saygın and Mehmet Ali ozturk (2011) who investigated the effects of 12 week aerobic exercise program on health related fitness components and blood lipids in obese girls. The result revealed that there were significant differences in BMI, body fat percentage and basal metabolism between pre test and post test scores in in the participantats But no significant differences were observed in all the variables.

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The purpose of this study was to evaluate the effect of twelve weeks aerobic exercise on cardio respiratory fitness and body composition of feresbet preparatory school grade 12th male students. For this purpose, the researcher reviewed the available literatures in order to decide the focus of the study and methodologies. In order to attain the general objective of the study, the following specific research objectives were formulated.

1. To evaluate the effect of twelve weeks aerobic exercise on cardio respiratory fitness.
2. To determine the effect of twelve weeks aerobic exercise on body mass index.
3. To assess the effect of twelve weeks aerobic exercise on body age.

Based on the above specific objectives, the hypotheses were formulated. In dealing with these basic objectives, the study conducted on grade twelve male students. Among the population 124 of grade twelve male students using purposive sampling system 32 students were taken as experimental of aerobic exercise training for three months and 3 days per week were attended. A pretest and post test of selected physical fitness tests were taken to gain the necessary information required.

Through paired t-test the data was analyzed. Hence, the following findings were investigated.

1. The finding of this study indicated that Improvement in cardio respiratory fitness was observed on participants. They had shown improvement as a result of the aerobic exercise training on Cardio respiratory fitness.
2. The Finding of this study also indicated that there is a significant reduction of BMI in the participants as a result of aerobic exercise. They show significant reduction with the consequence of aerobic exercise training.
3. The finding of this study showed that no significant changes were found in body age of the participants from pre to post test. After 12 weeks aerobic exercise the body age of the participants revealed in the t-test that they were relatively the same.

5.2. Conclusion

Based on the major finding of this study, the following points were stated as a conclusion.

- ✓ Twelve weeks aerobic exercise has positive effect on improvement of cardio respiratory fitness.
- ✓ Twelve weeks aerobic exercise has significantly reduced the body mass index.
- ✓ Twelve weeks aerobic exercise training had no impact on body age of students.
- ✓ For better health and improvement of physical fitness variables students should regularly engage in aerobic exercise program.
- ✓ Aerobic exercise has a positive effect on the improvement of body composition.

5.3. Recommendations

Based on results, discussions and findings of the study, the following would be recommended:

- For better improvement of physical fitness, students should engage in aerobic exercise at least 3 days per week for 60 minutes each day.
- Aerobic exercise had a positive effect on cardio respiratory fitness. So for the better improvement students should participate in aerobic exercise.
- Physical education teachers as a means to improve the physical fitness status of students' should encourage aerobic exercises among various classes and grade levels.
- Efforts through physical education educators should be made in advocating the importance of aerobic exercise training since it has enormous benefits.
- Studies should be conducted in the same area on different samples of age and sex.
- Aerobic exercise had a great effect on the reduction of excess body fat and BMI. So, similar studies should be conducted outside the school on obese population.
- Further study should be conducted in different schools to understand how aerobic exercise affects cardio respiratory fitness and body composition.

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7. APPNDICES

APPNDIX; A

Fitness training and test consent form

Researcher's Name: Habtamu Molla

Proposal title: Effect of Twelve weeks aerobic exercise on selected physical fitness variables in the case of Feres bet school grade 12 students in Dega Damot Woreda.

Purpose of the study

The purpose of this study is to assess & investigate the effect of twelve week aerobic exercise on selected health related fitness.

Procedure and duration:

You are kindly requested to participate in this research study as described below. This study will be governed by the regulation on human beings. This regulation requires that researcher should obtain a signed agreement (consent) from students to participate in this research.

Even if taking such type of fitness training & fitness test is one component of your regular aerobic exercise program, the researcher will explain detail about the purpose of the research, the procedure will be used. You will be involved in regular exercise for 60 minutes per session, three days per week for three months. You will be take care all the current standards of your health when you are participating in exercise.

Risk and safeguard

The risk of being participating this study is minimal. In fact muscle sprain, sprain and other injury may be occur if you are not followed proper warming up ,gradual progression and safe procedures. There are benefits for participating in this study such as you will be improving health related fitness.

Confidentiality:

Information of your participation in this study will be kept confidential. Records per training to this study will be recorded secretly in numbers &put in a secured storage area. Results will be reported in such a way that you cannot identified .The finding of this study will be general for the study subjects and will not reflect any thing particular individuals

Rights:

If you agree to engage in this study your participation should be voluntary. You right to stop participating at any time. If you decide not to take part, or if you stop participating at any time, your decision will not result in any penalty or loss of benefits which you otherwise are entitled.

Contact address

If you have any questions at any time about this research study, please contact:

Institutional Research Ethics Review Committee (IRERC) -----

HabtamumollaSimegn -----0909146474

WegeneWelteneus(PhD) -----0923670360

AbinetAyalew(PhD) -----0911827322

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

Signature of participant-----

Name-----

Date-----

8 Identify do you have any of the following disease?

A Diabetes B Stork

C Hypertension D Cardiovascular disease

9 Do you currently exercise regularly (at least 2 times per week) and/or work in a job that is physically demanding.

A. Yes B. No

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

A. Yes B. No

If yes explain your reason here. _____

Appendix C:

Table 1: List of personal profile the participates

No	Name of participants	Sex	section	Age	Height in M	Weight In Kg
1	A.M	M	12 A	19	1.52	51
2	Y.Z	M	12B	20	1.63	54
3	A.A	M	12F	20	1.56	52
4	A.A	M	12E	18	1.61	49
5	M.T	M	12E	18	1.71	57
6	H.M	M	12F	19	1.67	53
7	S.D	M	12E	18	1.72	58
8	B.G	M	12E	19	1.68	56
9	A.M	M	12A	20	1.57	52
10	Y.K	M	12A	20	1.72	56
11	D.Y	M	12D	20	1.59	53
12	A.A	M	12D	18	1.65	54
13	D.T	M	12D	19	1.68	52
14	B.K	M	12C	18	1.63	53
15	A.T	M	12C	19	1.71	56
16	Z.A	M	12C	20	1.65	59
17	M.K	M	12B	20	1.67	60
18	Y.A	M	12B	20	1.59	53
19	B.M	M	12B	19	1.67	54
20	D.G	M	12A	18	1.63	56
21	D.A	M	12A	19	1.72	58
22	B.A	M	12F	18	1.58	54
23	S.S	M	12F	18	1.59	51
24	T.A	M	12C	20	1.56	53
25	T.B	M	12C	20	1.57	54
26	M.A	M	12E	19	1.64	59
27	G.K	M	12A	19	1.65	51
28	F.A	M	12B	20	1.62	61
29	A.W	M	12C	20	1.68	54
30	E.M	M	12D	19	1.56	57
31	E.E	M	12B	19	1.58	55
32	S.A	M	12B	20	1.65	61

Appendix D:

Selected Physical Fitness Variables and Descriptive Characteristics of the Study Participants

No	Parameters	Type of Test	UNIT
1	Cardio respiratory fitness	12 minute run	Meter
		Three minute step test	Heart beat per minute
2	Body composition	Body Mass Index	kg/m ²
3	Body age	Resting heart beat and age	Age

Appendix E

Table 1: Characteristics of the study participants

Group	N	Age		Height		Weight	
		Mean	S.D	Mean	S.D	Mean	S.D
Experimental Group or participants of the study	32	19.16	.808	1.6331	.05538	54.88	3.087

Appendix F:

Pre and Post test Results of 12 minutes run test, Three minutes Step test and Body mass index Test

No	Cardiovascular endurance test								BMI test			
	12 minute run test in M				3 minute step test				Body mass index=w/h ²			
	Pre	Pos	Change	Average	Pre	Pos	Change	average	Pre	Pos	Change	Average
1	2450	3200	750	2825	88	68	20	78	22.07	21.06	-1.01	21.565
2	2500	3200	700	2850	95	73	22	84	20.32	19.21	-1.11	19.765
3	2700	3530	830	3115	104	77	27	90.5	21.32	21.00	-0.32	21.16
4	2460	3100	640	2780	93	80	13	86.5	18.90	18.07	-0.83	18.485
5	2650	3300	650	2975	120	98	22	109	19.49	18.32	-1.17	18.905
6	2700	3450	750	3075	103	83	20	93	19.00	18.05	-0.95	18.525
7	2540	3200	660	2870	118	95	33	106.5	19.61	19.03	-0.58	19.32
8	2700	3400	700	3050	98	68	30	83	19.84	18.75	-1.09	19.295
9	2800	3550	650	3175	105	75	30	90	21.10	20.00	-1.1	20.55
10	2670	3350	690	3010	115	80	35	97.5	18.93	18.05	-0.88	18.49
11	2650	3300	650	2975	120	90	30	105	21.96	20.65	-1.31	21.305
12	2590	3200	610	2895	98	70	28	84	19.83	18.75	-1.08	19.29
13	2480	3300	820	2890	99	72	27	85.5	18.42	18.02	-0.4	18.22
14	2670	3400	730	3035	125	98	27	111.5	19.95	18.25	-1.7	19.1
15	2730	3520	790	3125	96	74	22	85	19.15	18.54	-0.61	18.845
16	2480	3130	650	2805	107	81	26	94	21.67	20.37	-1.7	21.02
17	2540	3090	550	2815	89	63	26	76	21.51	20.37	-1.14	20.94
18	2600	3400	800	3000	104	87	17	95.5	20.96	19.77	-1.19	20.365
19	2750	3540	790	3145	95	65	30	80	19.36	18.61	-0.75	18.985
20	3000	3700	700	3350	119	83	36	101	21.08	20.02	-1.06	20.55
21	2900	3650	750	3275	103	79	24	91	19.61	18.74	-0.87	19.175
22	2980	3760	780	3370	120	92	28	106	21.63	20.34	-1.29	20.985
23	2800	3580	780	3190	99	78	21	88.5	20.17	19.56	-0.61	19.865
24	2760	3410	650	3085	102	86	16	94	21.79	20.43	-1.36	21.11
25	3100	3840	740	3470	113	93	23	103	21.91	20.82	-1.09	21.365
26	3050	3760	710	3405	115	87	28	101	22.94	21.71	-1.23	22.325
27	2950	3530	580	3240	87	63	24	75	18.73	18.00	-0.73	18.365
28	2540	3060	520	2800	92	65	27	78.5	22.06	20.99	-1.07	21.525
29	2650	3300	650	2975	125	96	29	110.5	19.13	18.10	-1.03	18.615
30	2800	3500	700	3150	96	64	32	80	21.22	20.23	-0.99	20.725
31	2720	3400	680	3060	109	86	23	97.5	22.03	21.11	-0.92	21.57
32	2600	3410	810	3005	95	77	18	86	22.45	21.00	-1.45	21.725

Appendix G:

Pre and Post Test Results of Body Age

No	Name of participants	Sex	Age	Body age				Resting heart beat			
				Pre	Post	Change	Average	pre	post	Change	Average
1	A.M	M	19	18	18	0	18	71	69	-2	70
2	Y.Z	M	20	19	19	0	19	69	67	-2	68
3	A.A	M	20	18	18	0	18	70	67	-3	68.5
4	A.A	M	18	17	17	0	17	68	66	-2	67
5	M.T	M	18	17	17	0	17	69	65	-4	67
6	H.M	M	19	18	18	0	18	72	68	-4	70
7	S.D	M	18	17	17	0	17	71	69	-2	70
8	B.G	M	19	18	18	0	18	72	70	-2	71
9	A.M	M	20	19	19	0	19	70	67	-3	68.5
10	Y.K	M	20	19	19	0	19	70	66	-4	68
11	D.Y	M	20	19	19	0	19	69	67	-2	68
12	A.A	M	18	17	17	0	17	68	65	-3	66.5
13	D.T	M	19	18	18	0	18	68	66	-2	67
14	B.K	M	18	17	17	0	17	69	66	-3	67.5
15	A.T	M	19	18	18	0	18	71	67	-4	69
16	Z.A	M	20	18	17	-1	17.5	74	67	-7	70.5
17	M.K	M	20	18	17	-1	17.5	73	70	-3	71.5
18	Y.A	M	20	18	17	-1	17.5	73	66	-7	69.5
19	B.M	M	19	17	16	-1	16.5	75	71	-4	73
20	D.G	M	18	16	15	-1	16.5	74	70	-4	72
21	D.A	M	19	17	16	-1	16.5	74	71	-3	72.5
22	B.A	M	18	17	17	0	17	72	69	-3	70.5
23	S.S	M	18	17	17	0	17	71	67	-4	69.5
24	T.A	M	20	19	19	0	19	69	66	-3	67.5
25	T.B	M	20	19	19	0	19	68	67	-1	67.5
26	M.A	M	19	18	18	0	18	70	70	0	70
27	G.K	M	19	18	18	0	18	71	68	-3	69.5
28	F.A	M	20	19	19	0	19	69	67	-2	68
29	A.W	M	20	19	19	0	19	72	69	-3	70.5
30	E.M	M	19	18	18	0	18	69	65	-4	67
31	E.E	M	19	18	16	-2	17	68	63	-5	65.5
32	S.A	M	20	19	19	0	19	73	66	-7	69.5

APPENDIX H

Table 1. First Month Training schedule (October, 2019)

Day	Types of exercise	Intensity of exercise	Weeks											
			1 st week			2 nd week			3 rd week			4 th week		
			Time	Rep	Rest	Time	Rep	Rest	Time	Rep	Rest	Time	Rep	Rest
Tuesday	Warming up exercise Jogging and leg, arm, stretching exercise Main part -walking -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	40 minute	2x2	1 minute	40 minute	2x2	1 minute	40 minute	4x2	1 minute	50 minute	4x2	1 minute
Thursday	Warm up exercise -jogging and leg, arm, stretching exercise Main part -walking -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	40 minute	2x2	1 minute	40 minute	2x2	40 minute	40 minute	4x2	1 minute	50 minute	4x2	1 minute
Saturday	Warm up exercise -jogging and leg, arm, stretching exercise Main part -walking -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	40 minute	2x2	1 minute	40 minute	2x2	1 minute	40 minute	4x2	1 minute	50 minute	4x2	1 minute

Table 2. Second Month Training schedule (November, 2019)

Day	Types of exercise	Intensity of exercise	Weeks											
			1 st week			2 nd week			3 rd week			4 th week		
			T	R	Res	Ti	Rep	Res	Ti	Re	Res	Ti	R	
Tuesday	Warming up exercise Jogging and leg , arm, stretching exercise Main part -walking -jogging -rope jumping - running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	50 minute	4x2	1 minute	50 minute	4x3	1 minute	50 minute	4x3	1 minute	50 minute	4x2	1 minute
Thursday	Warm up exercise -jogging and leg, arm, stretching exercise Main part -walking -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	50 minute	4x2	1 minute	50 minute	4x2	1 minute	50 minute	4x3	1 minute	50 minute	4x3	1 minute
Saturday	Warm up exercise -jogging and leg, arm, stretching exercise Main part -walking -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	50 minute	4x2	1 minute	50 minute	4x2	1 minute	55 minute	4x3	1 minute	55 minute	4x3	1 minute

Table 3.Three Month Training schedule (December, 2019)

Day	Types of exercise	Intensity of exercise	Weeks											
			1 st week			2 nd week			3 rd week			4 th week		
			Tim	Rep	Rest	Tim	Rep	Rest	Tim	Rep	Rest	Tim	Rep	Rest
Tuesday	Warming up exercise Jogging and leg , arm, stretching exercise Main part -walking , -jogging -rope jumping - running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	60minute	4x2	1 minute	60 minute	4x2	1 minute	60 minute	4x3	1 minute	60 minute	4x3	1 minute
Thursday	Warm up exercise -jogging and leg, arm, stretching exercise Main part -walking, -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	60minute	4x2	1 minute	60 minute	4x2	1 minute	60 minute	4x3	1 minute	60 minute	4x3	1 minute
Saturday	Warm up exercise -jogging and leg, arm, stretching exercise Main part -walking, -jogging -rope jumping -running on truck -sit ups Cooling down -Lower body stretching exercise and with breathing meditation	Moderate Intensity 60%	60minute	4x2	1 minute	60 minute	4x2	1 minute	60 minute	4x3	1 minute	60 minute	4x3	1 minute

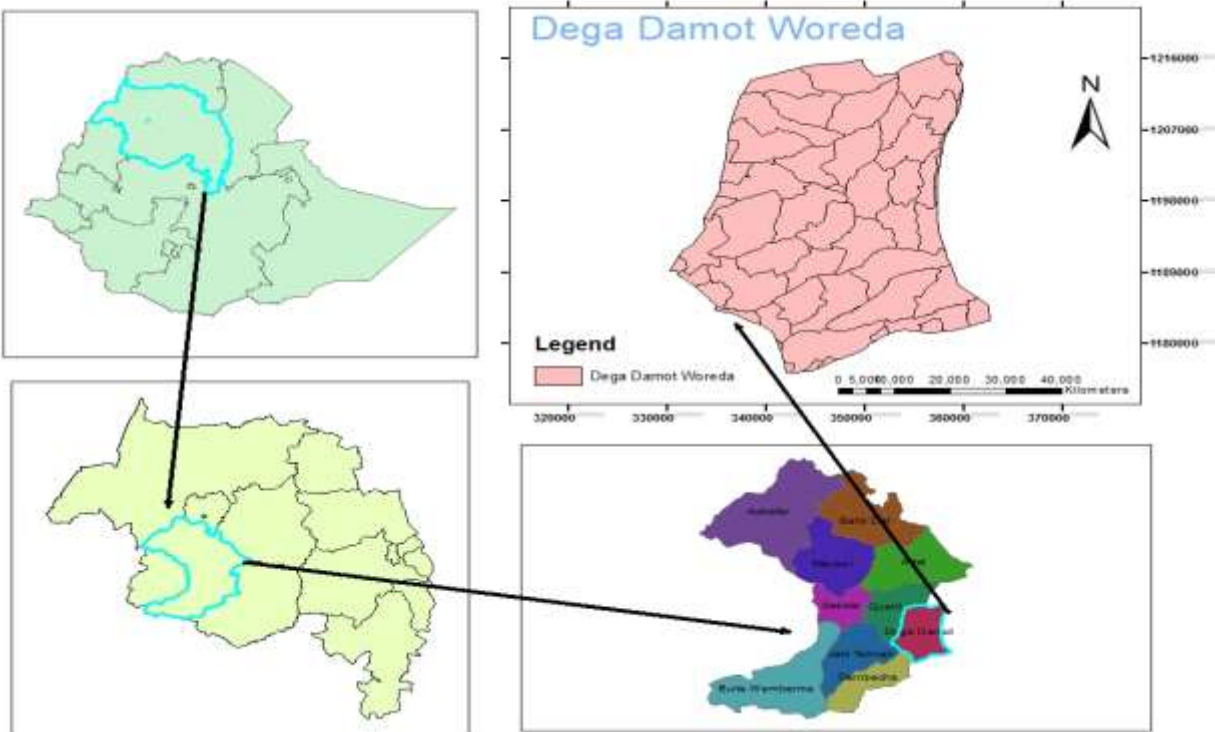


Figure 1 map of study area

(Degadamot Woreda Administrative Office, 2008(unpublished))



Figure 2 step up test



Figure 3 height measurement to calculate BMI



Figure 4 rope skipping



