



**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF EDUCATIONAL AND BEHAVIORAL STUDIES OF**  
**SCIENCES AND MATHEMATICS EDUCATION**

**Effect of Regular Exercise on Selected Skill Related Physical Fitness**  
**Components of Female's Students in Abyssinia Secondary School of Addis**  
**Ababa Addis Ketema sub city**

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**BY**

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## APPROVAL SHEET

### ADDIS ABABA UNIVERSITY COLLEGE OF EDUCATION AND BEHAVIORAL STUDIES

This is to certify that the thesis prepared by Tamrat yosef; **Effect of regular exercise on selected skill related physical fitness components of female's students in Abyssinia Secondary Schools of Addis Ababa Adis ketema Sub City** In partial fulfillment of the Degree of Master of Education in Teaching Physical Education complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

#### **Signed by Examining committee**

Name of Advisor	Signature	Date
Name of Internal Examiner	Signature	Date
Name of External Examiner	Signature	Date

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## **Abbreviations/Acronyms**

EG Experimental group

CG compressional group

MCG mean of compressional group

SCG standard compressional group

MEG mean of Experimental group

SEG standard Experimental group

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## ABSTRACT

*This study was conducted to investigate the Effects of regular exercise on selected skill related physical fitness components of female students at Abyssinia secondary school, located in Addis Ababa City Administration at Addis Ketema Sub City. To conduct this study the researcher used quasi-experimental research design. Purposive sampling method was used to select 30 female students from grade 9<sup>th</sup> female students. The respondents were used simple random sampling to classify into two groups as 15 students control and 15 students experimental group. Exercise programs of regular exercises were performed in a form of training for the experimental group under this study for three consecutive months. The activity was given with the frequency of 3 days per week for 3 months and the duration was 40 minutes per session. The skill-related physical fitness variables selected for the study were: agility (Illinois Agility test), speed (30m Sprint run) and power (Broad jump).*

*A mixed-methods study was used to investigate female students' change in skill related fitness components. Quantitative data were analyzed using descriptive statistics, paired-sample t-test, and independent sample t-test. SPSS was used to analyses quantitative data. The level of significance chosen was 0.05. In addition, qualitative data were gathered from selected experimental group female students using semi-structured interview items and analyzed. The result revealed that there was a significant difference between the Illinois agility test mean scores of EG and CG female Students. Also, there was a significant difference between 30m Sprint test mean scores of EG and CG female Students. Besides, there was a significant difference between Broad jump test mean scores of EG and CG female Students. Experimental group female students provided favorable opinion regarding 12 week regular exercise in improving agility, speed and power. Based on the finding of the study summary, conclusions and recommendations were made.*

**Key words:** Agility, speed, power, regular exercise

## **CHAPTER ONE**

### **INTRODUCTION**

This chapter provides a comprehensive foundation for the study by including the background, statement of the problem, research objectives, and research questions. It further outlines the significance of the study, scope of the study, and presents operational definitions of key terms.

#### **1.1 Background of the Study**

According to Gezegn Abera (2012), physical education is primarily delivered through physical activities that foster and preserve all facets of personality, including mental, social, and physical welfare. "Physical fitness" refers to the capacity to do everyday tasks with energy and alertness, without experiencing excessive exhaustion, and with sufficient reserves to engage in leisure activities and handle unexpected situations. Since the human mind and body work in perfect harmony, physical fitness is essential for people to adapt to their surroundings. A regular exercise routine is necessary for physical fitness. Although it is widely acknowledged that a child's appropriate growth and development depend heavily on their level of physical fitness, there isn't a consistently agreed-upon description of what exactly physical fitness is. It is evident from study and academic investigation that the multifaceted aspects of physical fitness may be separated into two categories: skill-related physical fitness and health-related physical fitness (Zerihun and Haileyesus, 2019).

Physical fitness has existed for as long as humanity. Regular physical activity reduces the risk of cardiovascular disease, stroke, and several types of cancer by improving or maintaining physical fitness. The two components of physical fitness that have been identified are those that are connected to skills and health. The component of health-related physical fitness is focused on wellbeing and health. It includes body composition, muscular strength and endurance, cardiovascular endurance, and flexibility. The skill-related physical fitness components, on the other hand, speak to the capacity to pick up sports and other physical activities. Agilities, power, speed, balancing coordination, and response time are all components of this skill (Moe, 2010).

The terms "exercise" and "physical activity" have been used interchangeably, and they really share a number of characteristics. For instance, exercise and physical activity are both defined as any energy-consuming movement of the body made by the skeletal

muscles. They are quantified in kilocalories, which range continuously from low to high, and they are positively connected with physical fitness as the frequency, duration, and intensity of movements increase. However, exercise is a subtype of physical activity and is not the same as physical activity. Exercise is defined as planned, scheduled, repeated, and purposeful physical exercise where the goal is to maintain or develop one or more aspects of physical fitness. Haileyesus and Zerihun (2019)

Regular physical activity can benefit people of all ages as long as it adapts to each person's fitness level and is acceptable. Properly performed progressive exercise will raise fitness levels and enhance health. Additionally, it will increase vitality, lower the chance of contracting several illnesses, enhance skill, and foster a sense of well-being. Exercise puts more strain on the body's systems than regular daily activities do, and as a result, the systems adjust anatomically and physiologically. Every activity requires the coordination and interaction of numerous body systems; for example, the skeletal and muscular systems work together to produce movement (Rosser, 2001).

Frequent exercise improves joint function, boosts physical well-being and makes you feel good, and improves physical working capacity by improving speed, power, agility, response time, coordination, and balance. It is acknowledged that physical education is a whole experience. A person's greatest potential is their level of physical condition. Daily physical activity is the only way to attain it (Cox, 1996).

It should take six to eight weeks to observe obvious effect from regular exercise, which is a progressive process. A grouping of exercise-related factors and traits that students can do in sports is called "effect of regular physical exercise on skill related fitness components" (Riches, 2017).

The body's potential for physical activity is known as skill-related fitness. This component emphasizes increasing the variety of exercises for each component and improving each component's performance and expertise (Lazano et al., 2009). Sports performance depends on skill-related physical fitness, which also helps guarantee that athletes or students have adequate endurance to improve technical skills-related physical fitness components (George, 2004 & Riches, 2017).

This research work intends to study skill related physical fitness components of female's student secondary school students through regular exercise in Abyssinia Secondary Schools of Addis Ababa.

## 1.2. Statement of the Problem

Theoretically, regular exercise is likely to have the biggest advantages. However, it is difficult to determine that regular exercise is more beneficial and efficient in enhancing a person's skill-related physical fitness. It is evident that taking part in a training program is a good way to do this. A person's physical, social, and psychological aspects of their life are enhanced and integrated through physical education, which is an essential component of the entire educational process. However, the natural connection between general education and physical education is frequently overlooked (Maraton, 1976). However, Ethiopian school curriculum of physical education class develops two credits hour per week. With respect to the norms and standards in each grade level of the physical education textbook, including grade 9, this is insufficient to enhance the skill-related physical fitness components that students must meet (WHO, 2010). For this reason, the researcher wishes to examine the impact of three months of consistent exercise training on the skill-related physical fitness of grade 9 students. The researcher will test the following research question.

One of the key physical activities that enhance fitness is regular exercise. The way they are treated and the fundamental interaction between physical education teachers and students determine how such skill-related fitness components develop. Known gender differences in the physiological response to exercise are associated with normative differences in body size, body composition, muscle characteristics and reproductive endocrinology. Compared to men, women are more likely to be smaller, have a larger percentage of body fat, and have a comparable cross-sectional area of muscle mass (Marliss *et al.*, 2000). Female reproductive hormones are thought to contribute to differences in exercise fuel metabolism (fat before carbohydrate), degree of exercise-induced muscle damage, and prevention of bone loss, but there are many questions remaining and much ongoing research in this area (Warren *et al.*, 2001). Increasing physical activity levels for females is important for health and mental wellbeing. Understanding and addressing the barriers preventing more female participation in physical activity is complex. Evidence shows that gender and the needs of females should be considered when developing specific physical activity opportunities (Nessim *et al.*, 2000). Many female students at Abyssinia Secondary Schools in Addis Ketema, Addis Ababa city, struggle with skill-related physical fitness components, according to the researcher's experience and observations. In light of this issue, it is of utmost importance to find an instructional intervention and investigate the effects of regular exercise on the components of physical fitness. For this reason, the researcher will examine 3 months of consistent exercise, 3 times a week, affects a few chosen skill-related fitness

characteristics, including agility (measured by the Illinois Agility Test), speed (30-meter sprint run), and power (broad jump).

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

The main objective of the study is to investigate the effect of regular exercise on selected skill related physical fitness components of female students.

#### **1.3.2 Specific Objectives**

The specific objectives of this study are:

1. To examine the effect of regular exercise on the agility of female students at Abyssinia Secondary School by comparing the mean scores of the experimental and comparison groups
2. To assess the effect of regular exercise on the speed of female students at Abyssinia Secondary School by comparing the mean scores of the experimental and comparison groups
3. To assess the effect of regular exercise on the power of female students at Abyssinia Secondary School by comparing the mean scores of the experimental and comparison groups
4. To get the opinion of female students in bringing change in Agility, speed, and power when regular exercise is employed.

### **1.4 Research questions**

In order to investigate the impact of regular exercise training on female students' agility, speed, and power, the researcher attempted to respond to the following research questions:

1. What are the impacts of regular physical exercises have on the agility of female students attending in Abyssinia secondary school?
2. What are the impacts of regular physical exercises have on the speed of female students attending in Abyssinia secondary school?
3. What are the impacts of regular physical exercises have on the power of female students attending in Abyssinia secondary school?
4. What is the opinion of female students on regular exercise to bring change in terms of agility, speed, and Power?

### 1.5. Limitations of the study

This study was conducted in one secondary school female students in Addis Ababa and, due to limited resources. It did not cover the students in other schools. Additionally, the research faced challenges due to lack of related studies.

### 1.6. Scope of the Study

The study was conducted in Abyssinia secondary school, at Addis Ababa City Administration in Addis ketema Sub city. It focuses on selected skill related physical fitness components such as Agility (Illinois Agility test), Speed (30m Sprint run) and Power (Broad Jump). The study cannot address all regular physical exercise and all schools in the surrounding.

### 1.7. Significance of the Study

The study has intended meaning to female Abyssinia secondary school students in that it widens their knowledge base of skill related physical fitness. Also, the Physical education research community was benefited from the investigation. Moreover, the study was positively influence teaching physical education in secondary schools. This means, the findings from this research are expected to improve student learning. Other schools across the country was used the results of this study. Physical education curriculum experts/professionals were also benefit in designing and/or modifying the curriculum-emphasizing skill related physical fitness components. Physical education educators in higher levels (colleges and universities) ware benefit from this research endeavor.

### 1.8. Operational Definition of Terms

**Regular exercise:** physical activity that is planned, structured and repetitive for the purpose of conditioning any part of the body (USDHHS, 1996).

**Skill-related physical fitness:** - Consists of those components of fitness that have a relationship with enhanced performance in athletic activities (Bouchard *et al...*2012).

**Agility:** - the ability to quickly change body position and make directional changes in body movement (Payne, 2009).

**Power:** - Combines speed and strength, ability to transfer energy swiftly in to force (Shorkey, 1990).

**Speed:** - the ability to perform a movement quickly (Johnet, 2011).

## CHAPTER TWO

### REVIEW RELATED OF LITERATURE

#### 2.1 The Concept of Physical Fitness

According to Corbin et al. (2006), Physical fitness is a person's ability to work efficiently, enjoy leisure time, stay healthy, withstand hypokinetic diseases or conditions, and handle emergency situations. It is also defined by the ability to perform occupational and recreational activities without experiencing excessive fatigue and the capacity to handle unforeseen emergencies. While a variety of variables contribute to the development of physical fitness, consistent physical exercise is essential to achieve the highest level of fitness. The ability to have a happy, balanced life is the general definition of fitness. It encompasses a person's social, intellectual, spiritual, and physical facets of existence. Cardiovascular endurance, muscular strength, muscular endurance, flexibility, and composition are some of the health-related and skill-related components of fitness (Olaitan, 2005). According to Wilmore and Costill (2002), skill-related elements include agility, balance, coordination, speed, power, and response time.

#### 2.2 Regular Physical Exercise

Exercise is defined as organized, systematic, and repetitive physical activity used to condition any area of the body. As a form of physical rehabilitation, exercise is crucial for maintaining physical fitness and improving health. Exercise helps prevent obesity, depression, and coronary heart disease. It also improves physical fitness and motor skills. One component of training that is crucial for enhancing or maintaining joint function strength is range of motion. Exercise increases muscular strength and endurance by providing the right amount of resistance. General health, endurance, and physical fitness can all be enhanced by a well-rounded exercise program (USDHHS, 1996; ACSM, 2000).

Okely (2001) defines physical activity as movement of the body caused by striated muscle contraction that significantly raises energy consumption. Exercise, defined as planned, systematic, and repetitive physical activity with the goal of enhancing and maintaining physical fitness, organized sports, or striated muscle that significantly raises energy expenditure, is included in this definition. Exercise, defined as planned, structured, and repetitive physical activity with the goal of enhancing and preserving physical fitness,

organized sports or games (basketball, football), transportation (cycling, walking), occupational physical activity (household chores, manual labor), and non-organized, recreational physical activities are all included in this definition.

Physical activity for children and adolescents must be appropriate to their developmental stage, skill proficiency, and maturity level. There should be a range of enjoyable activities included as well. Moderate to intense aerobic (cardio respiratory endurance) activities should make up the majority of activities. At least three times a week, incorporate exercises that help build bone, flexibility, and muscular endurance. Younger individuals might reach the 60-minute goal by adding up the time of their daily activities. It is crucial to emphasize that, at this age, a range of activities are crucial. For instance, engaging in moderate-to-intense physical activity will help strengthen the heart and lungs. Conversely, walking and other forms of activity that entail supporting body weight will assist kids and teens in maintaining energy balance (WHO, 2010).

Running, jumping, skipping, ball games, and gymnastics activities that involve carrying, climbing, and tumbling are all weight-bearing activities that put a lot of physical strain on the bones and joints. These activities will help children develop and maintain their muscular fitness and flexibility, and a variety of different activity intensities will benefit every part of their body (Tony and Susana, 2006).

### **2.3 Types of Physical Exercise**

Physical activity may be divided into two categories based on the primary physiological effects: anaerobic and aerobic.

Activities that are sufficiently strenuous and prolonged to preserve or enhance a person's cardiorespiratory fitness are referred to as aerobic physical exercise. Walking, basketball, soccer, and dance are examples of aerobic exercises that frequently call for the usage of broad muscle groups. These aerobic exercises and cardiorespiratory fitness are so closely related that the terms aerobic capacity and cardiorespiratory fitness are used interchangeably. According to technical definitions, aerobic physical activity is any activity that can be sustained for longer than a few minutes utilizing just metabolic energy pathways supplied by oxygen.

However, in both common and scientific usage, aerobic activity has come to mean physical activity that would be expected to maintain or improve cardiorespiratory fitness or

aerobic capacity. Whereas, anaerobic physical activity refers to high-intensity activity that exceeds the capacity of the cardiovascular system to provide oxygen to muscle cells for the usual oxygen consuming metabolic pathways.

Anaerobic activity can be maintained for only about two to three minutes. Sprinting and power lifting are examples of anaerobic physical activity. Haileyesus and Zerihun (1995).

Richs, (2015).states that aerobic activity, which includes swimming, running, and walking, is the type that is advised for improving endurance and minimizing the risk of heart disease. Anaerobic activity, such as lifting weights, requires a lot of work from a small number of muscles, in contrast. Because these kinds of activities are only sustained for a short duration of time and the oxygen supply is insufficient for aerobic metabolism, those muscles experience anaerobic metabolism and a significant oxygen deficit. Another example is sprinting, which is a high-intensity, brief activity that causes significant oxygen debt. Anaerobic activity, such as lifting weights, improves muscular growth and strength but has no effect on cardiovascular health.

#### **2.4. Physical Activity's Health Benefits for Women**

Physical activity, even at a low level, is better for your health than none at all. Women can benefit from participating in sports and physical activity in the following ways: preventing and managing diseases like coronary heart disease, strokes, type 2 diabetes and dementia; improving their health, fitness, and bone and body strength; preventing obesity and losing weight; lowering their mortality risks; improving their mental and overall wellbeing; and enhancing their social connections and enjoyment.

#### **2.5. Encouragement for Women to Engage in Physical Activity**

Women are less driven by performance objectives, like strength training, and place greater value on the social components of physical exercise than men do. Participation motivations might shift and develop over time. For instance, a woman could start exercising for health reasons but continue because she enjoys the social side or the mental health benefits. Maintaining or enhancing one's physical appearance, managing one's weight, finding personal fulfillment, enhancing one's wellbeing, and enhancing social connections and quality of life are all important motivators. Compared to older women, younger women (18–35) have been reported to be more driven by peer pressure, weight loss, and looks. On

the other hand, social expectations around physical appearance may hinder this. Health results are the main source of motivation for older women (Hanlon et al., 2010).

## **2.6. Effect of Regular Physical Exercise on Improvement of Fitness Components**

Physical exercise concentrates on improving athletes' coordination for a given activity and skill-related physical fitness component. Basically, the objective is to make anything easy to accomplish for a longer amount of time. Regular exercise also benefits the cardiovascular system, even if it appears that the athlete's muscles experience the most adaptation, especially in the early phases of exercise. Frequent exercise can significantly enhance one's ability to accomplish skills (Richs, 2015).

Physical fitness encompasses six skill-related components (agility, balance, coordination, speed, power, and reaction time) as well as five health-related components (muscular strength, muscular endurance, flexibility, cardiovascular endurance, and body composition). Fitness categories that improve one's performance in athletic or sports environments are known as skill-related fitness components. (NASPE, 2009)

## **2.7. Skill-related Physical Fitness Components**

### **2.7.1 Agility**

The capacity to quickly and easily shift one's body posture and movement direction is known as agility. According to Payne (2009), agility is the capacity to quickly and precisely alter the direction of the complete body in space.

Agility is the capacity to move swiftly, change positions often, and improve performance in a range of tasks. This is the result of combining coordination with speed. It enables you to quickly and effectively adjust your body posture and direction. The Illinois agility runs are the most widely used method of measuring agility (Wesson, 2013).

### **2.7.2 Balance**

Balance is the capacity to maintain equilibrium; in other words, something is balanced when it appears natural and easy to accomplish, or when its center of gravity is over its region of support. Balance is the harmonious development of a person's physical, mental, and spiritual qualities. To compete in their sports, gymnasts, yogis, skaters, and surfers all require extremely skilled balance. These athletes are not the only ones that gain from

balance training, though. The capacity to change your body position so that you stay upright is known as balance. As your center of gravity shifts while you move, you may modify your posture. This is known as proprioception, or understanding where your body is in space (Aman JE et al., 2014). Balance plays a significant role in many activities and is necessary for both improved performance and safety in a small number of sports. For example, balance training helps trail runners avoid rolling their ankles or suffering a terrible fall after slipping on a muddy route or tripping over a root. Try these to improve your balance: On one foot

### **2.7.3 Coordination**

Coordination is the capacity to employ senses and body parts to carry out motor activities precisely and smoothly. In order to create a fluid and effective movement, coordination entails arranging the relevant motor programs in the proper order and making good use of the neuromuscular system. Therefore, the capacity to combine sensing and motor systems to create effective movement is known as coordination (John Karen 1999).

### **2.7.3 Power**

Power is defined by Shorkey (1990) as work divided by time, or the pace at which work is completed. If two people can complete the same task more efficiently within the same amount of time, then their power is greater. It mixes velocity or speed (distance/time) with strength (force). Power is evaluate by vertical leaping or tossing a heavy item (Hetzler, 2015). Power is the capacity to quickly transform energy into force. Additionally, it is an explosive strength, which is the capacity to efficiently combine speed and strength to generate the greatest amount of muscular power at the fastest possible pace. It is the pace at which work is completed or energy is used. Power is defined as the pace at which work is performed ( $\text{work} = \text{Force} \times \text{Distance}$ ), and power is a function of both force and time ( $\text{power} = \text{work} / \text{time}$ ). Power is the sum of strength and explosiveness (speed), the maximal muscle force delivered at speed, as work equals the generation of force x distance. Jumping, throwing, and hitting all require power Jeffreys, I. (2013).

### **27.4 Speed**

The capacity to move fast is known as speed. It is the amount of time it takes us to react to stimuli. It is also stated that speed, which is measured in meters per second, is essentially the pace at which you can move all or some of your body. Consequently speed is the rate of

movement and is frequently used to describe the capacity for quick movement. It is a crucial component of all explosive sports and activities that call for abrupt changes in space (John Karen 1999). The most basic speed measurements are a 30m, mark a non-slip surface and run as fast as the competent can covered from a flying start over the course and record the time taken (Wesson, 2013).

### **2.7.5 Reaction Time**

Reaction is the capacity to improve the body or a body part's motions and activities at a certain instant to get the greatest result. This is the amount of time that passes between seeing a stimulus and the initial movement that results from it. Thus, the ability to quickly perceive and respond to both expected and unexpected events in one's environment is measured by one's response time. Stick drop tests are the most accurate way to assess reaction time (Wesson, 2013)

### **2.8. Objective of Physical Fitness Development**

The long-term, main goal of physical education programs is to preserve and enhance human health. This represents any aspect of health, including mental, emotional, social, and physical. It is applicable to all people, irrespective of their national origin, race, color, economic status, or creed. The goal of physical development is to help the human body grow and improve organ system. The term "organic" describes the human body's respiratory, circulatory, excretory, heart-regulating, and digestive systems, among others. It leads to the capacity to recuperate, rest from tiredness, and maintain adaptive efforts. Physical fitness, physical conditioning, and organic or biological development that focus on enhancing the body's mobility are also included in this goal. (Bucher, 2012).

Exercise and physical fitness have been shown to provide both short- and long-term physiological and psychological advantages. The elements of physical fitness will be defined in this part, along with a review of recent studies on each of these elements.

The three components of physical fitness are physiologic, skill-related, and health-related. Cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition are the health-related elements of physical fitness. Bone integrity, morphologic fitness, and metabolic fitness are the physiological aspects of fitness. Speed, power, agility, balance, coordination, and response time are all aspects of physical fitness

that are associated to skills. The American College of Sports Medicine provided these definitions of the elements of physical fitness (ACSM, 2006)

The short term and long term physiological and psychological benefits of physical fitness and exercise are well documented. This section will define the components of physical fitness and review current research across all of these components.

Physical fitness is divided into three components: health-related, skill-related, and physiologic components. The health-related components of physical fitness are cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition. The physiologic components of fitness are metabolic fitness, morphologic fitness, and bone integrity. Skill related components of physical fitness are speed, power, agility, coordination, balance, and reaction time. These definitions of the physical fitness components come from the American College of Sports Medicine (ACSM, 2006), the largest sports medicine and exercise science organization in the world and widely accepted as the standard for information and reference in sports medicine. Crossfit.com is an on-line fitness community that has become extremely popular for its daily workouts based on a concept of functional movements that are constantly varied and performed at high intensity. Cross fit emphasizes the importance of functional fitness and has modified the ACSM definitions of skill and health related components of fitness to arrive at the components of functional fitness.

## **2.9. Phases of Fitness exercise**

According to Head Quarters Department of the US army, (1998) and Wrest, and Lombardo, (1994) the physical fitness training program is divided in to three phases: - preparatory, conditioning, and maintenance. The starting phases for different units or individuals vary depending on their age, fitness levels, and previous physical activity. Young healthy persons may be able to start with the conditioning phase, while those who have been exercising regularly may already be in the maintenance phase. Persons who have not been active, especially if they are age 40 or older, should start with the preparatory phase.

### **2.9.1. Preparatory Phase**

In order to make the body ready for the conditioning phase, the preparation phase helps the respiratory and muscular systems become used to activity. The initial workload has to be moderate. Frequency, intensity, and time should all be gradually increased in order to move

from a lower to a greater level of fitness. Training must progress gradually, and recovery days should be spaced out equally throughout the week.

In order to prepare the body for the conditioning phase, the preparation phase aids in the acclimatization of the muscular and cardiovascular systems to exercise. In the beginning, the workload has to be reasonable. Increases in frequency, intensity, and duration should be made gradually and strategically in order to go from a lower to a greater level of fitness. The week should be divided equally between recovery days, and training should advance gradually.

The preparatory phase helps both the cardio respiratory and muscular systems get used to exercise, preparing the body to handle the conditioning phase. The work load in the beginning must be moderate. Progression from a lower to a higher level of fitness should be achieved by gradual, planned increases in frequency, intensity, and time. Recovery days should be evenly distributed throughout the week, and training should progress slowly.

### **2.9.2. Conditioning Phase**

Trainers must increase the amount of exercise and/or workout intensity as their strength and/or endurance grow in order to achieve the desired degree of fitness. To enhance cardio-respiratory endurance, for instance, runners need to run for longer periods of time. Starting with the preliminary phase, kids should progressively extend their running duration by one or two minutes per week until they are able to run for 20 to 30 minutes straight. Until they achieve the required level of fitness, they can now raise the intensity. They ought to work out no less than three times a week and no more than two days in between. (Yen Way, 2008)

### **2.9.3. Maintenance Phase**

The conditioning phase's high level of fitness is maintained throughout the maintenance phase. Here, advancement is no longer the main focus. To maintain nearly any suitable level of physical fitness, three times a week, a well-planned 45–60 minute workout that includes a warm-up and cool-down at the proper intensity is sufficient (Way yen, 2008).

### **2.10. Exercise Intensity**

Exercise lode refers to how hard activate for your body than for normal condition. Your appropriate workout intensity will depend on your present level of fitness as well as your health and fitness objectives. Work hard, but not too hard, is the aim. Exercise intensity is commonly categorized as low, moderate, or high. Working hard but not too hard—what the National Physical Activity Guidelines for Australians refer to as moderate-intensity—is the

aim for the greatest health benefits. According to these recommendations, you should strive for at least 30 minutes of moderate-intensity exercise most days in order to maintain excellent health. Men and women experience this in the same way (Matsumoto, 2014).

Determining and managing the right level of exercise intensity is a difficult task that affects both physiological changes and individual adherence to an exercise plan. Every aspect of fitness may be improved with a three-day-per-week practice, depending on the time allotted for each session and the manner in which training sessions are done. The main component of a moderate intensity training primary system is an 8-week training intensity program, according to a groundbreaking uncontrolled study (Wilkins, 2019).

### **2.11. Contribution of physical Fitness**

Involving in physical exercise can help burn off energy and eventually result in more energy. According to West and Shores (2008), regular exercise may enhance energy levels. Training in daily physical exercise can supply the energy based on the notion that mental organization follows movements. Developing motor skills is one of the most fundamental advantages of physical activity. Early learning in all children is predicated on their motor development (Wolfson, 2000). According to Burton and Miller (1998), the development of basic movement skills, such as locomotors and object handling abilities, typically occurs between the ages of one year and seven. (Richardson,D.G 2006) It is crucial to give students these chances to learn conditioning activities in skill-related fitness routines. It is thought that physical activity, fitness, and motor abilities are related. When compared to children with strong motor competence, children with low motor competence are likely to be less physically fit (Haga, M.2009)

Active play and regular exercise are the cornerstones of a healthy lifestyle, which will keep kids fit and healthy for the rest of their lives. Frequent exercise improves a student's ability to study (Kong, 1999). Learning via movement is essential for academic achievement. Exercise also stimulates the formation of neurons and nerve nets in the brain's corpus callosum, cerebellum, and basal ganglia in addition to strengthening the heart, lungs, muscles, and bones. Blood and oxygen flow to the brain are increased by aerobic exercise p.107D ouglas Hartmann of the University of Minnesota gave a thorough overview of previous research on the relationship between high school students' academic success and physical exercise in 2008. He discovered that the vast majority of research shows that there

is a link between the two and that this relationship is unquestionable. In reality, more recent research aims to identify the causative elements that link the two. Students that are physically active are better able to focus and concentrate (Young, 2001).

## **2.12. Factors Influencing Fitness**

According to Sharkey, B. J. (1990), a person's level of fitness is influenced by a number of things.

### **2.12.1. Heredity**

Numerous elements that contribute to aerobic fitness are inherited by humans, such as a larger heart, more hemoglobin and red blood cells, a high proportion of slow oxidative and rapid oxidative-glycolytic muscle fibers, and the respiratory and cardiovascular systems' maximum capacity. Muscles and other cells' mitochondria, which produce energy, are inherited from parents. Recent research suggests that muscle's ability to adapt to training may also run in families. Fitness and the capacity to function at a high level are also influenced by other genetic variables, such as physique and body composition.

### **2.12.2. Training**

Although an exercise increase blood volume and enhances the respiratory and cardiovascular systems' functionality and capacity, the most significant changes occur in the muscle fibers engaged during the exercise. Aerobic training may be the most significant health impact of exercise as it increases muscle's capacity to generate energy aerobically and changes metabolism from glucose to fat. Burning fat lowers blood fat levels, cardiovascular risk, and fat accumulation. Additionally, it lowers the risk of several malignancies and increases insulin sensitivity. Training does, of course, increase performance, but only in the activity that is employed for training.

### **2.12.3. Gender**

Boys and girls have a little difference in aerobic fitness up to puberty, but after that, girls lag behind. Depending on their degree of exercise, young women's aerobic fitness is typically 15–25% lower than that of young males. However, in terms of VO<sub>2</sub>max and performance times, highly skilled young female endurance athletes are only 10% better than male endurance athletes of the same age.

## **2.13. Principles of Exercise Training**

According to research on exercise training, several general principles of conditioning have been identified. The creation of an effective fitness program requires the use of these principles.

### **2.13.1 Warm-up**

Starting an exercise session slowly and tapering it off toward the end is another crucial exercise program strategy. Many bodily systems can adapt to higher metabolic demands thanks to the warm-up. Muscle temperatures rise along with the heart rate and blood flow. Starting an exercise activity with a warm-up is definitely more pleasant and likely to be safer. A decent warm-up is a steady increase in walking pace or progressively more strenuous workouts. Cooling down, or progressively lowering exercise intensity at the conclusion of each session, is equally crucial. The abrupt cessation of vigorous exercise can result in blood clotting in the legs, which can lead to fainting or, more dangerously, heart problems. Therefore, it's a good idea to finish a workout session with five minutes of stretching and slow strolling. During the cool-down, the heart rate should progressively decrease until, at the conclusion of five minutes, it should be fewer than 120 beats per minute for those under 50 and less than 100 beats per minute for people over 50 (Kern, 1999).

### **2.13.2 Specificity**

The observation that a change in physical fitness or adaptation of the body is particular to the type of training is the basis for the specificity principle. This simply means that flexibility exercise must be done if increasing flexibility is a fitness goal. It is necessary to use resistance or strengthening workouts if one wants to gain strength. Although this idea is straightforward, it is often disregarded. Numerous deceptive advertisements for fitness equipment or programs guarantee total physical health with just one basic training method. Such statements should raise suspicions, and one should think about whether the suggested exercise training is the right kind to bring about the intended results (Kern, 1999).

### **2.13.3 Overload**

The overload principle According to the principles of overload in exercise physiology, training adaption requires a higher than usual stress or load on the body, therefore increasing our work load in proportion to our increased strength or endurance is necessary to enhance our fitness. For the muscles to be able to function at a higher degree of intensity

for longer periods of time, they need to be gradually strained by working against a load that is larger than what they are used to (Edge and Bishop 2006).

#### **2.13.4 Progression**

According to the principle of progression, a steady and progressive increase in workload over time will lead to a gain in fitness without the danger of damage. Overload that is increased too slowly is unlikely to improve, but overload that is increased too quickly might cause harm to the Progression principles also emphasized the importance of adequate rest and recuperation. You should avoid overtraining and reducing fitness by avoiding prolonged stress on the body, which can lead to fatigue and injury (Edge and Bishop 2006). People usually make the error of trying to alter their fitness level too quickly. A well-known example is when a middle-aged person suddenly starts an intense training regimen after not exercising for 20 years. Often, such exercise results in an injury or at the very least, discomfort and stiffness. The rate at which one should advance to a greater level of activity is not governed by strict guidelines. The best guideline is the person's subjective assessment of how well the body appears to handle further exercise. Generally speaking, it could make sense to avoid increasing exercise levels more frequently than once every two weeks (Carbine 2012).

#### **2.13.5 Individual differences**

One should consider the above-discussed exercise training ideas to be broad guidelines. Exercise adaptations vary from person to person in both the physiological and psychological domains. It is possible for two persons who begin the same workout regimen and are otherwise very similar to have very different opinions about it. For one individual, the exercise can be too simple, whereas for another, it might be too difficult. Making changes to the training regimen to accommodate individual tastes is definitely appropriate. Because each person is unique, they all react to training differently. Higher training volumes can be tolerated by certain individuals, while higher intensities may be more effective for others. This depends on a number of variables, including your mental health, chronological or athletic age, muscle fiber kinds, genetic aptitude, and other aspects of your life (Gaal, 2012).

#### **2.13.6 Recovery**

Rest and recuperation are necessary for the body to heal itself. To make sure your body doesn't get overuse injuries or tiredness, you need to take both short breaks, like the hours

between daily practices, and longer ones, like days or weeks, to recuperate from a lengthy season. Motivated sportsmen tend to overlook this.

### **2.13.7. Adaptation**

The body adjusts to exercise at a certain level over time. At that level, this adaptation leads to increased efficiency, less effort, and less muscle breakdown. That's why you felt sore after your initial two-mile run, but now it serves as a warm-up for your major activity. For this reason, in order to keep improving, you must alter the stimulus by making it longer or more intense. The same is true for adjusting to lower activity levels.

### **2.13.8. Reversibility**

A certain workout, such as jogging five miles or bench pressing 150 pounds ten times, can become impossible to perform properly if you discontinue doing it. The molecular changes, such as increased capillaries (blood supply to the muscles) and mitochondrial density, will reverse, and your muscles will atrophy. By doing maintenance or a modified training program at times when life gets in the way, you may significantly limit this rate of loss. This is why almost all sports coaches advise their athletes to continue exercising throughout the summer. Because of the concepts of specificity, progression, overload, adaptability, and reversibility, it is crucial to practice often and consistently if you wish to enhance your performance. It's not really possible to make up missed sessions in a single season. They are missed chances to get improved. You can't or shouldn't go as far as you had intended to on weekend B (progression & overload) if you skip your long ride on weekend A. Your swimming muscles and skills won't be worked out or stressed on Monday if you skip your swim (specificity). You lose more than one week when you miss a week because of vacation (adaptation and reversibility).

### **2.13.9. Frequency, intensity, and duration**

To provide guidance on how much exercise an individual should do, exercise physiologists have developed equations based on research. It is generally agreed that to improved and maintain physical fitness, the exercise must be performed on a regular basis. A continuity of about every other day or three days per week appears minimally sufficient. Many people engage in more frequent activities than this, and, of course, such additional exercise is acceptable provided that one does not become over trained and suffer illness or injury. Numerous studies have examined the level of intensity needed to yield benefits, yet many

people believe that exercise is only beneficial when it causes pain. This is just untrue. Regular exercise at 45 to 50 percent of one's maximum capacity is sufficient to enhance general health and physiological functioning. Most people find this degree of intensity to be comfortable. Measuring heart rate while exercising is a trustworthy method of determining exercise intensity. About 50% of a person's maximal capacity is represented by an exercise heart rate that is 65% of his or her maximal heart rate. One can estimate their maximum heart rate by deducting their age in years from 220 (or, for active guys, by deducting half of their age from 205). Therefore, the projected maximum heart rate of a 40-year-old male who is inactive is 180 beats per minute. This guy is exercising at 117 beats per minute, which is approximately 50% of his maximal capacity, as this is 65% of his peak rate. A person should exercise for a few minutes to enable their heart rate to settle before measuring their heart rate. After stopping their workout, the exerciser should promptly check their pulse and count the beats for 15 seconds. The rate in beats per minute is obtained by multiplying this by four. Since the heart rate quickly returns to resting levels when activity is ended, it is imperative that the pulse be obtained as soon as possible. As previously mentioned, exercising at a 50% intensity level can enhance physiological functioning and offer health advantages. The maximal degree of fitness required for competitive athletics will not be achieved with this level of activity (Kern, 1999).

### **2.14 The Development of Fitness Test**

Physical fitness tests conducted in the early 1950s revealed that European children were more fit than American children. As a result, former President Eisenhower of the United States created the current President's Council on Physical Fitness and Sport. Performance-related tests measuring strength, endurance, running, agility, and jumping ability were part of the American Alliance for Health, Physical Education, and Recreation's (AAHPER) Youth Fitness Test (1961), which was created to assess the fitness levels of American children (Safritin,m,l 1990). Health-related fitness piqued the interest of researchers and physical education professionals in the 1970s (Safritin,m,l Safritin,m,l 1990). Performance-related tests that assessed strength, endurance, running, agility, and jumping sparked a greater interest in health-related fitness because the AAHPER Youth Fitness test items included a 50-yard dash and a standing long jump, which were not intended to assess the fitness levels of the American children (Collis, 2000).

However, the 600-yard run is not a strong indicator of aerobic capacity because the AAHPER Youth Fitness test items included a standing long jump and a 50-yard sprint, which were not regarded as health-related fitness tasks. The components of the health-related fitness test include other health-related factors including body composition, musculoskeletal fitness, and cardio-respiratory fitness, all of which are strongly correlated with general health. The exam employs the norm-reference standard; instead of determining the degree of health that the children should attain, it merely compares them to other kids and young people. According to the Criterion-referenced standard, children must meet all of the test's basic requirements in order to be deemed suitable. It is comparable to the criteria or standard. A group of specialists created the benchmarks fitness grams by combining normal data, empirical data, and professional opinion (Warner, s,o 2021). In the sphere of juvenile fitness, it is a crucial breakthrough. There is much more to the fitness gram program than only evaluating physical fitness. Personalized performance reports are given to students who take the health-related exam. Important advice on how to develop healthy exercise habits that will raise their level of physical fitness is also provided to them. Early on, it teaches pupils that consistent exercise may set the stage for lifelong health. More than 8 million kids have been assessed using the Fitness Gram format in North America to far, and it is quickly taking the place of other standardized tests for evaluating pupils in the United States and Canada (Collis, 2000). 21. When the Council of Europe Committee for the Development of Sport took the initiative to develop the goals and principles of a Euro fit test battery in 1978, a more concerted effort got underway. Both motor and endurance fitness tests were evaluated and selected between 1980 and 1982. Because of its global impact, a preliminary Euro Fit guidebook was produced in French and English in 1983, followed by a final one in 1988. Strength, power, speed, flexibility, balance, endurance, and body composition as determined by height, weight, and skin fold thickness are all included in the test items. Although the Euro Fittest battery is a significant stride in Europe, its purpose is to measure abilities rather than talents. But it is only the beginning. Norm-referenced or criterion-referenced scales still need to be developed in the future, even if the Euro Fit Handbook permits the use of these assessments. (Van Mechelen & Kemper, 1996).

## CHAPTER THREE

### RESEARCH DESIGN AND METHODOLOGY

#### 3.1. Description of Study Area

This study analysis in Abyssinia secondary school of Addis Ketema sub city in Addis Ababa city administration Abyssinia Secondary School is located around pawlos referral hospital and Abebe Bikila Stadium. Addis Ketema is one of the eleven sub cities of Addis Ababa. The latitude of Addis Ketema, Addis Ababa, Ethiopia is Latitude  $9.04607^{\circ}$  or  $9^{\circ} 2' 46''$  north the Longitude is  $38.72444^{\circ}$  or  $38^{\circ} 43' 28''$  east.

#### 3.2. Research Design

In order to obtain the necessary data for the research project on Abyssinia Secondary School female students, the study employed a quasi-experimental research design. A quasi-experimental research study design is used to collect information concerning students' regular practice for enhancing their skills related fitness components. The quasi-experimental method is appropriate for the field test intended (Berk, R.A 2022). This methodology is appropriate for describing any effects of regular physical exercise upon selected skill-related physical fitness components. The field test is designed to occur over twelve consecutive weeks to assess the difference that will occur between the experimental and control groups while capturing the effects of regular physical activities involving various intensities on their performance across selected components. In the quasi-experimental design, research replaces physical control of the experimental situation with statistical "controls."

#### 3.3. Source of Data

In this study the researcher was used primary data source. Primary data was collected through appropriate fitness test for selected skill related fitness test from the study participants/subjects.

#### 3.4. Description of study population

The total population of this study was all female students of grade 9 students in two sections. Out of this population 30 students were selected.

### 3.5. Sampling Size and Sampling Techniques

The research was conducted in Abyssinia Secondary School of the grade 9<sup>th</sup>. 30 female students were selected purposively in this school. The subjects were classified into two groups; as experimental and control group. The respondents were used simple random sampling to classify into two groups as control 15student and experimental group15student. Hence female students have an equal opportunity of being chosen from the population as an experimental and control group.

### 3.7. Data Collection Instruments

The Experimental materials used by the researcher to collect data on three selected skill related physical fitness tests were paper, pen, pencil, stopwatch, common meter, cones, and whistle.

### 3.8. Data collection procedures

To examine the impact of regular physical exercise on specific skill-related components of physical fitness, the researcher collected data from subjects using pre, during, and post-tests using the proper skill related physical fitness tests including the actual performance test as an instrument so there would be a consistent measure to collect data. Data was collected from subjects in the area of skill-related fitness test equipment accessible through structured program use. To get data from subjects' tests were taken during three phases-at the beginning, mid, and end of twelve training weeks. As a result, the actual performance test was to have documented that the effect from individual level and different levels of intensity with regular physical exercise. The researcher documented the data, with one extra assistance to the researcher to average three documented tests (pre-test, during intervention test, and post-test) will give data as reliable based on the inter-rater agreement. The researchers plan to field test the materials in the study based on the independent variables. The data collection procedure will follow these steps.

**Step-1 Pretest:** - Before starting the experiment, we will assess the motor fitness components needed for the participants by using well-established standard tests (Wijekulasuriya, 2021). The exam and fitness component scores will be accurately recorded.

**Step 2 during intervention:** - After the pre-test, participants in the experimental groups took part in regular physical exercise programs. These exercises lasted for twelve weeks, with the workout intensity gradually increasing from low to moderate.

**Step 3 Post Test:** - After the twelve-week experiment ends, all participants in both the control and experimental groups will take part in post-testing. The tests used will be exactly the same as those given during the pre-test to ensure accurate and fair comparisons between the two sets of results. This consistency helps researchers clearly see any changes caused by the experiment.

**A. Evaluating Agility Test (Illinois agility test)** Tests and measurements help we gather important information that we use to evaluate performance and make decisions later on. When analyzing the results, it's important to remember that certain factors can affect the outcome.

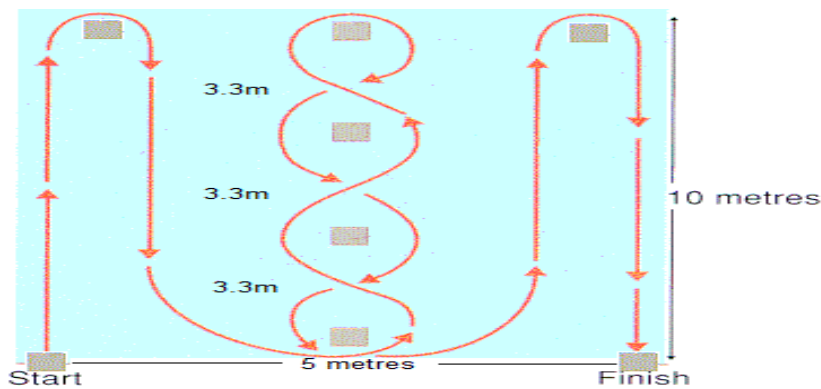
### **Purpose**

The Illinois Agility Run Test measures the development of an athlete's agility (Tawfeeq et al., 2021).

### **How to Conduct the Test**

To get accurate results, the participant needs to run the red line route shown in the diagram as fast as possible. Here's a step-by-step guide:

- **Warm-Up:** The athlete should warm up for about 10 minutes to prepare their body and reduce injury risk
- **Course Setup:** The assistant carefully sets up the course exactly as shown in the diagram, using cones or tape to mark the route.
- **Starting Position:** The athlete lies face down at the "Start" cone, ready to begin.
- **Starting the Test:** When the assistant says "GO," they start the stopwatch immediately.
- **Running the Course:** The athlete jumps up and follows the red line route around the cones, moving as quickly as possible to the finish.
- **Recording Time:** Once the athlete crosses the "Finish" cone, the assistant stops the stopwatch and notes the time.



**Figure3.1. Agility Test (Illinois agility test)**

### **B. Sprint or Speed Tests (30m Sprint run)**

Depending on the variables being evaluated and how applicable they are to the athlete's sport, sprint or speed tests can be conducted across a range of distances. Covering the specified distance in the shortest amount of time is the goal of all speed tests.

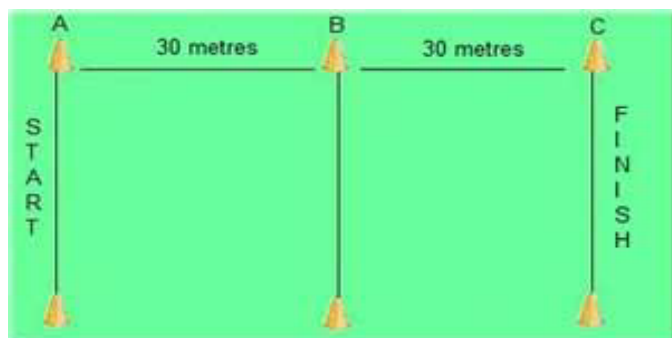
**Purpose:** This test's objectives are to ascertain speed endurance, maximal running speed, and acceleration based on the distance run.

**Necessary of equipment:-**Cone markers, a timer or timed gates, a measuring tape or designated track, and an auxiliary data recorder.

Pre-test: Educate the subject about the test procedures. Get informed consent after doing a health risk assessment. Forms should be prepared and basic data like age, height, weight, gender, and test conditions should be noted. The test area should be measured and marked out. Do a sprint warm-up first.

The process is as follows:

- The athlete warms up for ten minutes;
- The assistant uses cones to mark out a 60-meter straight section (AC) and positions a cone at the 30-meter point (B);
- The athlete sprints the 60 meters from a sprint start with the proper start commands (on your marks, set, "GO") from the assistant;
- The assistant starts the stopwatch when "GO" is given.
- The assistant records the time the athlete's torso crosses the 30-metre point (B) and the 60-metre point (C)



**Figure3.2. Speed Tests (30m Sprint run)**

### **C. Evaluating power test (Standing Long Jump Test or Broad Jump)**

The Broad Jump, often known as the Standing Long Jump, is a popular and simple measure of explosive leg power. In addition to being a component of the power quadrathlon and jumps decathlon assessments, the standing long jump was also a competition in the Olympic Games and is currently held at UK Sports Hall events.

**Purpose:** to evaluate the explosive power of the legs

**Equipment required:** A soft landing surface is preferable, a non-slip floor for takeoff, and a tape measure to measure the distance jumped. There is also commercial long jump landing mats available.



**Figure3.3. Broad jump field**

### **3.9. Method of Data Analysis**

Both quantitative and qualitative techniques were used to analyze the fitness test data that was gathered. Using basic statistics like mean and standard deviation, the data was

examined. Additionally, the computerized statistical package software (SPSS version 23) was utilized to demonstrate the significance of the differences between and within the control group and experimental group using the independent samples t-test.

### **3.10. Training protocol**

For the successfulness and reliability of the study the following training protocol would be needed. Wear properly, never skips warm up, respecting each other is mandatory, have a sportsmanship characteristic, follow safety procedure, follow instructions and take feedback from the researcher, remember to train flexibility, don't forget to take enough rest between activities, and to cool down activities. The training schedules are three days per week. i.e., Monday, Wednesday and Friday for consecutive 12 weeks except for especial case were planned for training session in which 40 minutes were allotted for each day. During the test day the participant would informed not to participate in any physical activities Specifically, Jumping, agility and speed activities. The activities that participant cannot perform include, vertical jump, broad jump, Illinois agility, T-test and speed activities. In addition, during the exercise intervention, participants are instructing not to participate in any other form of physical activity. At baseline and post, participants were instructed not to use any stimulant and ergogenic aids in their meals before 24hr from the test day.

### **3.11. Strategies of Ensuring Data Quality**

To ensure quality of data, only standardized physical skill used to minimize the mistakes during data collection and the assistance skill test recorder train to collect the appropriate data. In addition, the mentioned test is recorded with video and photograph for further check. Finally, the data coded and fed to software in data interpreting.

### **3.12. Ethical Considerations**

It is crucial to ensure ethical issues are taken into account when doing research, particularly on human subjects. As a result, consent from the parents and the school is required. It also clarifies that the study is only being conducted for academic purposes and that participation is entirely voluntary, allowing respondents to decline or withdraw at any point during the research period. Participants are not compelled to participate in the study and are informed to give their consent.

Invite research assistants from the target group to further demonstrate the importance and respect of local expertise.

While conducting research, and especially on human being the assurance of ethical considerations is important. Accordingly, Permission from students' parent and the school, explain the purpose of the research that the study is for academic purposes only, make clear that the participation is voluntary and that the respondents is free to decline or withdraw at any time during the research period, Respondents are not forced into participating in the study, The participant informed to give consent to make the choice to participate or not.

Moreover, show the value and appreciation for knowledge of the locality by inviting research assistants from the target population. About the participants, however, the researcher bases all of his activities on the rules and regulations of sportsmanship, and he is respectfully asking them to be honest and try to provide a similar intervention for the students in the control group at the end of the study period to help them accomplish what they would have missed if they were assigned to the control group. The research addressed the investigation's ethical concerns. In addition to guaranteeing the secrecy of the information provided to the study and preventing harm from participation, the researcher was able to preserve the privacy of research participants. Subjects' participation in this study is entirely voluntary, and they have the right to decline participation at any point during the training session. The study was conducted in accordance with the university's rules, code of conduct, and research ethics policies. Regarding the participants, however, the researcher's activities were conducted in accordance with the laws and regulations of sportsmanship, and he would respectfully ask them to be truthful.

## 4. RESULTS AND DISCUSSIONS

### 4.1. Introduction

The analysis and interpretation of data gathered from field assessments administered to female secondary school pupils in Abyssinia are the topics of this chapter. This chapter deals with the analysis and interpretation of data gathered from field tests from Abyssinia secondary school female students. . Participants' demographics, the analysis and interpretation of agility tests, the analysis and interpretation of 30m sprint runs, the analysis and interpretation of broad jump tests, and students' perceptions of skill-related physical fitness tests (Agility, Speed, and Power) are the main topics of this chapter.

### 4.2. Demographic Characteristics of the Participants

**Table4.1. Demographic Characteristics of the Participants**

	N	Age	RHR	MHRA	WHR	HER
Minimum	30	15	67	2303	165	150
Maximum		18	78	206	139	154
Mean		16.2	72.6	204.8	132.2333	151.9333

According to the above table (Table 4.1) the participants of the study were 100% (N=30) female students whose age is between 15-18. (RHR), maximum heart rate (MHR), working heart rate (WHR) and exercise heart rate (EHR) were described respectively.

### 4.3. Analysis and Interpretation of Agility test

**Table 4.2 Descriptive Statistics for Agility test (Illinois agility test)**

Illinois agility test		N	Mean	Std. Deviation	Std. Error Mean
Experimental group	pre test	15	22.9293	.76721	.19809
	post test		20.9060	.51247	.13232
Comparison Group	pre test	15	23.9560	.62481	.16132
	post test		23.8440	.62225	.16066

According researcher (Davis et al, 2000), for the agility test, the standard is poor when it is more than 23.3 seconds. The standard becomes excellent for those who can perform less than 17.0sec and average for those who can perform between 18.0-21.7 sec. In this regard, before the intervention, the mean score of 22.9293(experimental) and 23.9560 (comparison) are both at the poor level of the standard. After the intervention the means are 20.9060 (experimental) and 23.8440 (comparison) which shows the comparison group remains poor while the experimental group improves to average level.

**Table 4.3. paired samples T-test result Agility test**

Illinois agility test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
CG	pretest - posttest	.1120	.2708	.06992	-.03796	.26196	1.602	14	.132
EG	pretest - posttest	2.023	.7567	.19540	1.60425	2.44242	10.35	14	.000

The above table (Table 4.3) indicates that no significant difference exists between the comparison group pretest and posttest (MD =.1120; SD=.2708 and P =.132). The p value is greater than 0.05. This indicates that the comparison group pretest and posttest agility test values were similar for female students. The Agility skill performance of the control group female students did not show any difference in the posttest when compared with pretest.

The experimental group showed a significant difference with in pretest and posttest (MD = 2.023; SD =.7567 and P =.000), according to the table (Table 4.3). The p-value of the experimental group shows existence of level shift. This suggests that the 12-week regular exercise practice in experimental group's enhanced agility skill more than that of the control group. The experimental group's agility skill performance level differed with in pretest and posttest, as indicated by the mean difference of 2.023. Therefore, it was indicated that regular exercise has a beneficial impact on improving female students' Illinois agility.

The Illinois agility test results of the experimental group and comparison group of female students at Abyssinia Secondary School were compared using an independent samples t-

test to see if there was a statistically significant difference. The results are presented in Table 4.4.

**Table4. 4 Independent Samples Test for Illinois agility test**

Variable	Group	N	M	SD	SE	Df	t	P
Illinois agility test	EG	15	20.91	.51	.21	28	-14.12	.000
	CG	15	23.84	.62				

According to an independent samples t-test study, there was a significant difference between the Illinois agility test mean scores of EG and CG female Students (MEG=20.91, SD EG=.51, NEG=15 and MCG=23.84, SCG=0.62, NCG=15;  $t(28) = -14.1239$ ,  $P=0.000$ ). This indicates that EG Female students and CG Female students are different in terms of Illinois agility test mean score. The Illinois agility test of EG is at an average level, but the agility test of CG is at a poor level. This result appears to corroborate the findings of Haga, who claimed that motor abilities, fitness, and physical activity are related (Haga, 2009). Additionally, it supports the findings of USDHHS (1996) and ACSM (2000), which showed that a well-rounded exercise program may enhance physical fitness and endurance while also improving overall health.

The most important complicated motor skill is agility. This phrase refers to the capacity to halt, quickly alter course, and quicken in reaction to an outside signal. Top athletes should have developed a high degree of agility in several sports, including combat sports (Sharkey et al., 2008). In several works of literature, quickness is used interchangeably with agility or change-of-direction speed (Young, 2006). However, Sheppard and Young (2006) argued that the concept of quickness has limits since it assumes that quickness alone contributes to agility and ignores deceleration or a change of direction. According to the research, agility must take into account not just speed but also the capacity to change direction, decelerate, and then accelerate again in reaction to stimuli. According to Montgomery (2002), agility is a complicated collection of separate abilities that come together to enable quick deceleration, direction changes, and reacceleration in response to an external stimuli.

#### 4.4. Analysis and Interpretation of 30m Sprint run test

**Table4.5. Descriptive Statistics for 30m Sprint run test**

30m Sprint run test		Mean	N	Std. Deviation	Std. Error Mean
Experimental group	pre test	6.1953	15	.57197	.14768
	post test	4.4487	15	.29744	.07680
Comparison Group	pre test	6.6033	15	.46215	.11933
	post test	6.5940	15	.45911	.11854

According researcher (Davis et al, 2000), for the 30m Sprint run test, the standard is poor when it is more than 5.0 seconds. The standard rises to excellent for those who can score below 4.5 sec and average for those who can perform between 4.7 - 4.8 sec. In this regard the mean score of experimental group is 6.1953 and comparison group is 6.6033. Both group female students are at the poor level of the standard. After treatment the means of experimental group is 4.4487 and comparison group is 6.5940. After intervention, the comparison group remained at poor while the experimental group improved to excellent.

**Table 4.6. Paired Samples T Test for 30m Sprint run test**

Paired Samples Test									
30m Sprint run test		Paired Differences					T	df	Sig. (2-tailed)
		Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
EG	pretest - posttest	1.74667	.53996	.13942	1.44765	2.04568	12.528	14	.000
CG	pretest – posttest	.00933	.02631	.00679	-.00524	.02391	1.374	14	.191

Table 4.6 shows that there hadn't significant difference with in the comparison group pretest and posttest score of female students (MD =.00933, SD=.02631, P =.191). The p value is greater than 0.05. This indicates that the comparison group pretest and posttest 30m Sprint run test (speed) values were similar for female students. The 30m Sprint run performance of the comparison group female students did not show any difference in the

posttest when compared with pretest. The p value is greater than 0.05 implying that the comparison group pretest and posttest were notching. In the other way, the speed skill ability of the group in the pretest and posttest did not show any difference.

Also, the same table (Table 4.6) shows that there was significant difference with in experimental group pretest and posttest score of female students (MD =1.74667, SD=.53996, P =.000). The p-value of the experimental group indicates level change.

This indicates that the 12-week regular exercise in experimental group improved 30m speed better than comparison group. The mean difference was 1.74667, which implies a difference between 30m speed performance level of the pretest and posttest in the experimental group. Therefore, the implication was that a regular exercise has a positive effect on improvement of the 30m speed test of female students.

An independent samples t-test was used to determine whether there was a statistically significant difference in the speed of experimental group and comparison group female students in Abyssinia Secondary School. Table 4.7 displays the findings.

**Table4. 7 Independent Samples Test for 30m Sprint**

Variable	Group	N	M	SD	SE	df	t	P
Speed (30m Sprint)	EG	15	4.45	.29	.14	28	-15.19	.000
	CG	15	6.59	.46				

According to an independent samples t-test study, there was a significant difference between 30m Sprint test mean scores of EG and CG female Students (MEG=4.45, SDEG=.29, NEG=15 and MCG=6.59, SCG=0.46, NCG=15; t(28)=.- 15.19, P=0.000). This indicates that EG Female students and CG Female students are different in terms of speed test mean score. The 30m Sprint test of EG is at excellent level, but the 30m Sprint test of CG is at a poor level.

This result supports the findings of other studies (Ferro et al, 2014). As previously mentioned, the kinds of regular workouts can differ significantly based on fitness objectives and can be adapted to any degree of fitness, from beginners to experts. A sufficient amount of these criteria directly affects how successful trainers are throughout training. According to Cochrane (2016), consistent exercise is also a gradual process that should take eight to twelve weeks to observe noticeable results. Therefore, it would be beneficial to carry out more thorough research whether the issue is related to the type or

length of regular exercise. Therefore, more thorough research would be helpful if the issue is related to the type or length of the regular exercise.

The three main components of running speed—reaction speed, simple movement time, and movement frequency—determine the body's capacity to run a given distance in the fewest amount of time (Ferro et al., 2014). The efficiency of trainers during training is directly impacted by an adequate level of these characteristics. According to (Mohr, 2016), new ideas for the training process ought to prioritize strength and speed training over endurance workouts. As is common in this discipline, it is noticed that a sprint can occasionally begin while the trainers run at a negligible pace and make repeated direction changes. While motion and its speed are visible, the cerebral cortex's perception and processing of information happens covertly. A trainer's pace during training is determined by the individual's psychophysical aptitudes as well as their speed. It is deemed unproductive to run a sprint with a quick yet incorrect movement..

#### 4.5. Analysis and Interpretation of Broad jump test

**Table 4.8. Descriptive Statistics for Broad jump test**

Paired Samples Statistics					
Broad jump test		Mean	N	Std. Deviation	Std. Error Mean
Experimental group	pre test	1.5713	15	.14217	.03671
	post test	1.7800	15	.09358	.02416
Comparison Group	pre test	1.5480	15	.07022	.01813
	post test	1.5660	15	.05914	.01527

According researcher (Davis et al, 2000), for the Broad jump test, the standard is poor when it is more than 1.50metr. The standard becomes excellent for those who can perform more than >1.91m and above average for those who can perform between 1.91 - 1.78m sec. In this regard the mean score of experimental group is 1.5713and comparison group is 1.5480. Both group female students are at the poor level of the standard. After intervention the means of experimental group is 1.7800 and comparison group is 1.5660. After intervention, the comparison group remained poor while the experimental group improved to above average.

**Table 4.9. Paired Samples T Test for Broad jump test**

		Paired Samples Test							
Broad jump test		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
EG	pretest - posttest	.20867	.07180	.01854	.24843	.16891	11.256	14	.000
CG	pretest – posttest	.01800	.04858	.01254	.04490	.00890	1.435	14	.173

Table 4.9 shows that there was no significant difference between the comparison group pretest and posttest score of female students (MD =.01800, SD=.04858, P =.173). The p value is greater than 0.05. This indicates that the comparison group pretest and posttest Broad jump test values were similar for female students. The Broad jump performance of the comparison group female students did not show any difference in the posttest when compared with pretest. The p value is greater than 0.05 implying that the comparison group pretest and posttest were at similar level. In the other way, the Broad jump performance of the group in the pretest and posttest did not show any difference.

Also, the same table (Table 4.9) shows that there was significant difference between experimental group pretest and posttest score of female students (MD = .20867, SD =.07180, P =.000). The p-value of the experimental group indicates level change. This indicates that the 12-week regular exercise in experimental group improved Broad jump better than comparison group. The mean difference was .20867, which implies a difference between Broad jump performance level of the pretest and posttest in the experimental group. Therefore, the implication was that a regular exercise has a positive effect on improvement of the power skill of female students.

An independent samples t-test was used to determine whether there was a statistically significant difference in the Broad jump of experimental group and comparison group female students in Abyssinia Secondary School. Table 4.10 displays the findings.

**Table 4. 10 Independent Samples Test for Broad jump test**

Variable	Group	N	M	SD	SE	df	t	P
Broad jump test	EG	15	1.78	.09	.1549	23.64	7.487	.000
	CG	15	1.57	.06	6			

According to an independent samples t-test study, there was a significant difference between Broad jump test mean scores of EG and CG female Students (MEG=1.78, SDEG=.09, NEG=15 and MCG=1.57, SCG=.059, NCG=15;  $t(23.64)=7.49$ ,  $P=0.000$ ). This indicates that EG Female students and CG Female students are different in terms of Broad jump test mean score. The Broad jump test of EG is at an excellent level, but the Broad jump test of CG is at a poor level. This finding is support regular physical activity, fitness, and exercise are critically important for the skill and performance enhancing of all, whether they participate in vigorous exercise or some types of moderate exercise can gain performance-enhancing benefits. Even among frail and very old adults, mobility and functioning can be improved through physical activity (Butler.1998). Standing long jump is considered a good predictor of sprint and jump performance, which presents correlations highly with isokinetic measures of lower extremity force (Ashby, 2002).

Previous researchers have also investigated various aspects of the standing long jump. These studies have examined the significant correlations between a range of isometric, kinetic, kinematic, and SLJ performance parameters (Prieto et al., 1998) as well as the body configuration and joint function of both the upper and lower segments between adults and preschool-aged children (Horita et al., 1991).

A popular and simple measure of explosive leg strength is the standing long jump, commonly known as the broad jump. It's one of the NFL Combine's fitness tests. Measurement of leg explosive power is the goal of the standing long jump, which was originally an Olympic event and is now a sport in Sports Hall events. In many sports, jumping is a basic movement skill that requires intricate upper- and lower-limb motor coordination to accomplish well. According to Ashby (2002), standing long jump (SLJ) is regarded as a reliable indicator of sprint and jump performance, which exhibits strong correlations with isokinetic measurements of lower extremity force. Several aspects of the standing long jump have previously been examined by earlier scholars. These studies have examined the significant correlations between a range of isometric, kinetic, kinematic, and SLJ performance

parameters (Prieto et al., 1998) as well as the body configuration and joint function of both the upper and lower segments between adults and preschool-aged children (Horita et al., 1991). The leaps may be categorized based on how the arms move. For example, leaps with free arm movement (JFA) and jumps with restricted arm motion (JRA). The impact of arm movement on SLJ performance was investigated in order to determine whether arm swing may improve the jumping distance when comparing the JRA and JFA jump categories (Heegaard, 2002). Although the biomechanical evidence supporting this finding is ambiguous, the optimal takeoff (TO) angle of SLJ in adult females was determined to be 29°–38° in order to identify further biomechanical processes for enhancing movement performance (Ashby et al., 2002). Mackala and colleagues have also examined the various TO positions for SLJ, determining that the quality of SLJ is affected differently by parallel or straddle foot beginning posture (Siemienski et al., 2013). Additionally, Koch et al. investigated how warm-up exercises and stretching can affect the SLJ in patients who were moderately and well-trained. According to the results, leaping ability was significantly correlated with maximal muscular strength, whereas warm-up exercises had a minor impact on jumping performance (Mackala et al., 2013). Generally the above 3 tables indicates after 12 weeks of regular exercise have positive effect on speed skill for females students experimental group it have change between pretest and posttest after intervention . In general, the three tables above indicate that regular exercise has a good impact on power skill (broad jump). The experimental group in this study had a higher mean score on the Broad Jump test than the comparison group.

#### **4.6. Students' perception of Skill-related Physical fitness tests (Agility, Speed, and Power)**

**Interview1.** How do you see changes in you and your agility after 12 weeks of regular exercise?

**FS1:** after the exercise I have some agility and health states are good.

**FS2:** yes I have change the agility skill better than for the normal condition.

**FS3:** I have a big difference with before training and after exercise in my agility Skill and all Activity

**FS4:** I get good health, physical appearance and average level of agility skill

**FS5:** I developed the ability of agility after regular exercise

**Interview2.** How do you see changes in you and your speed after 12 weeks of regular exercise?

**FS1:** after the exercise I have some speed and health states are good.

**FS2:** yes I have change the speed greater than before the exercise ability

**FS3:** I developed the ability of my speed

**FS4:** I improved speed skill

**FS5:** I get good speed performance

**Interview3.** How do you see changes in you and your power after 12 weeks of regular exercise?

**FS1:** after the exercise I have developed power.

**FS2:** I have changed the power skill beater than for the normal condition.

**FS3:** I improved power skill

**FS4:** get good power performance

**FS5:** I have a beige difference with before training and after exercise in my  
Power skill and all Activity

**Interview4.** How do you see 12 weeks of regular exercise as a whole?

**FS1:** I seen very important regular exercise to developed different skill and preservation health states

**FS2:** In the 12weeks regular exercise I developed physical fitness components for example flexibility, body composition, endurance and skill of power speed agility

**FS3:** after 12 weeks regular exercise I developed the attitude in physical exercise the importance of human bing

**FS4:** It's good I get different benefits the whole actives and to incised the Interest of to participate in deferent sport activities

**FS5:** I understand regular exercise is very important to improve life style

Most EG female students are very satisfied to participate in the interventions.

## CHAPTER FIVE

### 5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter of the thesis consists of three main sections-Sections 5.2, section 5.3, and section 5.4, which focus on summary, conclusions, and recommendations respectively.

#### 5.2 Summary

This section of the thesis presents summary of the findings and discussions. A mixed method study findings and discussions of both strands (quantitative and qualitative) were presented in chapter four-previous chapter. The main purpose of this study was to investigate the effect of regular exercise on selected skill related physical fitness components. This study had four specific purposes. These were:

1. To examine the effect of regular exercise on the agility of female students at Abyssinia Secondary School by comparing the mean scores of the experimental and comparison groups
2. To assess the effect of regular exercise on the speed of female students at Abyssinia Secondary School by comparing the mean scores of the experimental and comparison groups
3. To assess the effect of regular exercise on the power of female students at Abyssinia Secondary School by comparing the mean scores of the experimental and comparison groups
4. To get the opinion of female students in bringing change in Agility, speed, and power when regular exercise is employed.

Congruently, the following research questions were answered in this study.

1. What are the effects of regular physical exercises on agility of Abyssinia secondary school female students?
2. What are the effects of regular physical exercises on speed of Abyssinia secondary school female students?
3. What are the effects of regular physical exercises on power of Abyssinia secondary school female students?
4. What is the opinion of female students on regular exercise to bring change in terms of speed, Power, and agility?

Based on the data gathered, the following major findings were obtained. The paired sample t-test analysis, independent sample test and all the variables of physical fitness test was found to have positive mean gain from pre-test to post-test. Finally, the 12-weeks three days per week of regular exercise on selected skill related physical fitness components was found to be positive which supports the literature.

### **5.2.1 Research Question One**

What are the effects of regular physical exercises on Agility of Abyssinia secondary school female students?

Paired sample t-test indicated that no significant difference exists between the comparison group pretest and posttest. The p value is greater than 0.05. This indicates that the comparison group pretest and posttest agility test values were similar for female students. The Agility skill performance of the control group female students did not show any difference in the posttest when compared with pretest. Also, paired sample t-test indicated significant difference exists in the experimental group between pretest and posttest. The p-value of the experimental group indicates existence of level change. This indicates that the 12-week regular exercise program in experimental group improved agility better than control group. A regular exercise has a positive effect on improvement of the Illinois agility of female students. An independent samples t-test study, there was a significant difference between the Illinois agility test mean scores of EG and CG female Students. This indicates that EG Female students and CG Female students are different in terms of Illinois agility test mean score. The Illinois agility test of EG is at an average level, but the agility test of CG is at a poor level.

### **5.2.2 Research Question Two**

What are the effects of regular physical exercises on speed of Abyssinia secondary school female students?

Paired sample t-test shows that there was no significant difference between the comparison group pretest and posttest score of female students. The p value is greater than 0.05. This indicates that the comparison group pretest and posttest 30m Sprint run test (speed) values were similar for female students. The 30m Sprint run performance of the comparison group female students did not show any difference in the posttest when compared with pretest. The p value is greater than 0.05 implying that the comparison group pretest and posttest

were about similar level. In the other way, the speed skill performance of the group in the pretest and posttest did not show any difference.

Also, Paired sample t-test showed that there was significant difference between experimental group pretest and posttest score of female students. The p-value of the experimental group indicates level change. This indicates that the 12-week regular exercise in experimental group improved 30m speed better than comparison group. A regular exercise has a positive effect on improvement of the 30m speed test of female students. An independent samples t-test study, there was a significant difference between 30m Sprint test mean scores of EG and CG female Students. This indicates that EG Female students and CG Female students are different in terms of speed test mean score. The 30m Sprint test of EG is at excellent level, but the 30m Sprint test of CG is at a poor level.

### **5.2.3 Research Question Three**

What are the effects of regular physical exercises on power of Abyssinia secondary school female students?

Paired sample t-test showed that there was no significant difference between the comparison group pretest and posttest score of female students. The p value is greater than 0.05. This indicates that the comparison group pretest and posttest Broad jump test values were similar for female students. The Broad jump performance of the comparison group female students did not show any difference in the posttest when compared with pretest. The p value is greater than 0.05 implying that the comparison group pretest and posttest were at similar level. In the other way, the Broad jump performance of the group in the pretest and posttest did not show any difference.

Also, Paired sample t-test showed that there was significant difference between experimental group pretest and posttest score of female students. The p-value of the experimental group indicates level change. This indicates that the 12-week regular exercise in experimental group improved Broad jump better than comparison group. A regular exercise has a positive effect on improvement of the power skill of female students. An independent samples t-test study, there was a significant difference between Broad jump test mean scores of EG and CG female Students. This indicates that EG Female students and CG Female students are different in terms of Broad jump test mean score. The Broad jump test of EG is at an excellent level, but the Broad jump test of CG is at a poor level.

#### 5.2.4 Research Question four

What is the opinion of female students on regular exercise to bring change in terms of speed, Power, and agility?

Most EG female students are very satisfied to participate in the interventions. In the 12weeks regular exercise I developed physical fitness components for example flexibility, body composition, endurance and skill of power speed agility. It's good I get different benefits the whole actives and to incised the Interest of to participate in deferent sport activities.

### 5.3. Conclusions

This section of the chapter draws together the findings and summary of the study. The findings and summary in this thesis were based on four objectives and four research questions, which explored the effect of regular exercise on selected skill related physical fitness components of female's students in Abyssinia Secondary Schools of Addis Ababa Adis ketema Sub City. Data were gathered using the measuring instruments and analyses were made. The comparison group pretest and posttest agility test values were similar for female students. The Agility skill performance of the experimental group female students did showed difference in the posttest when compared with pretest. The 12-week regular exercise program in experimental group improved agility better than comparison group. A regular exercise has a positive effect on improvement of the Illinois agility of female students. An independent samples t-test study, there was a significant difference between the Illinois agility test mean scores of EG and CG female Students. The Illinois agility test of EG is at an average level, but the agility test of CG is at a poor level. The comparison group pretest and posttest 30m Sprint run test (speed) values were similar for female students. The 30m Sprint run test (speed) performance of the experimental group female students did showed difference in the posttest when compared with pretest. The 12-week regular exercise program in experimental group improved speed better than comparison group. A regular exercise has a positive effect on improvement of the speed of female students. An independent samples t-test study, there was a significant difference between the speed test mean scores of EG and CG female Students. The 30m Sprint test of EG is at excellent level, but the 30m Sprint test of CG is at a poor level. The comparison group pretest and posttest 30m Sprint run test (speed) values were similar for female students. The Broad jump (power) performance of the experimental group female students did

showed difference in the posttest when compared with pretest. The 12-week regular exercise program in experimental group improved power better than comparison group. A regular exercise has a positive effect on improvement of the Broad jump of female students. An independent samples t-test study, there was a significant difference between the power test mean scores of EG and CG female Students. The Broad jump test of EG is at an excellent level, but the Broad jump test of CG is at a poor level.

In the current study, female students' speed, agility, and power improved after 12 weeks of consistent training. Overall, this study shows that by applying to training principles, the scheduled, routine exercises were effective in developing the chosen skill-related physical fitness components, such as agility, power, and speed.

#### **5.4. Recommendations**

According to the study's findings, participants' chosen skill-related physical fitness components were considerably enhanced after 12 weeks of consistent exercise training. The following suggestions are offered in light of the study's outcomes, recommendations, and debate.

- Regular exercise has been shown to enhance skill-related physical fitness components, so it makes sense to continue working to increase the intensity of these gains in physical education and fitness programs.
- School physical education classes must to include and promote regular exercise regimens. Students' skill-related physical fitness capacities would be enhanced as a result.
- Students should exercise for 30 minutes every day, at least three days a week, to enhance their physical condition. As a result, more physical education classes should be offered each week, with a focus on consistent activity.

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## APPENDICES

### APPENDIX-A

The following tables are demographic characteristics of the participants, analysis and interpretation of the three variables (Agility, Speed and Power) which are discussed in the chapter four in the form of graphs.

**Table7. 1. Demographic Characteristics of the Participants Table**

	N	Age	RHR	MHRA	WHR	HER
Minimum	30	15	67	2303	165	150
Maximum		18	78	206	139	154
Mean		16.2	72.6	204.8	132.2333	151.9333

**Table7.2 Descriptive Statistics for Agility test (Illinois agility test)**

Illinois agility test		N	Mean	Std. Deviation	Std. Error Mean
Experimental group	pre test	15	22.9293	.76721	.19809
	post test		20.9060	.51247	.13232
Comparison Group	pre test	15	23.9560	.62481	.16132
	post test		23.8440	.62225	.16066

**Table7.3. paired samples T-test result Agility test**

Illinois agility test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
CG	pretest - posttest	.1120	.2708	.06992	-.03796	.26196	1.602	14	.132
EG	pretest - posttest	2.023	.7567	.19540	1.60425	2.44242	10.35	14	.000

**Table 7. 4 Independent Samples Test for Illinois agility test**

Variable	Group	N	M	SD	SE	Df	t	P
Illinois agility test	EG	15	20.91	.51	.21	28	-14.12	.000
	CG	15	23.84	.62				

**Table7.5. Descriptive Statistics for 30m Sprint run test**

30m Sprint run test		Mean	N	Std. Deviation	Std. Error Mean
Experimental group	pre test	6.1953	15	.57197	.14768
	post test	4.4487	15	.29744	.07680
Comparison Group	pre test	6.6033	15	.46215	.11933
	post test	6.5940	15	.45911	.11854

**Table7.6. Paired Samples T Test for 30m Sprint run test**

30m Sprint run test		Paired Differences					T	df	Sig. (2-tailed)
		Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
EG	pretest - posttest	1.74667	.53996	.13942	1.44765	2.04568	12.528	14	.000
CG	pretest – posttest	.00933	.02631	.00679	-.00524	.02391	1.374	14	.191

**Table7. 7 Independent Samples Test for 30m Sprint**

Variable	Group	N	M	SD	SE	df	t	P
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<b>Speed (30m Sprint)</b>	EG	15	4.45	.29	.14	28	-15.19	.000
	CG	15	6.59	.46				

**Table7.8. Descriptive Statistics for Broad jump test**

<b>Paired Samples Statistics</b>					
<b>Broad jump test</b>		Mean	N	Std. Deviation	Std. Error Mean
Experimental group	pre test	1.5713	15	.14217	.03671
	post test	1.7800	15	.09358	.02416
<i>Comparison Group</i>	pre test	1.5480	15	.07022	.01813
	post test	1.5660	15	.05914	.01527

**Table7.9. Paired Samples T Test for Broad jump test**

<b>Paired Samples Test</b>									
<b>Broad jump test</b>		Paired Differences					t	df	Sig. (2-tailed)
		Mean	S.D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
EG	pretest - posttest	.20867	.07180	.01854	.24843	.16891	11.256	14	.000
CG	pretest – posttest	.01800	.04858	.01254	.04490	.00890	1.435	14	.173

**Table7. 10 Independent Samples Test for Broad jump test**

<b>Variable</b>	<b>Group</b>	<b>N</b>	<b>M</b>	<b>SD</b>	<b>SE</b>	<b>df</b>	<b>t</b>	<b>P</b>
<b>Broad jump test</b>	EG	15	1.78	.09	.1549	23.64	7.487	.000
	CG	15	1.57	.06	6			

## Tools and Application

In order to investigate the effects of regular physical exercises on selected skill related physical fitness components, the researcher will collect data from the subjects by use pre, during and post-test through the appropriate skill related physical fitness tests including actual performance test as instrument so that there is consistent tool to measure data.

**Table7.11 A. Evaluating Agility Test (Illinois agility test)**

Age	Excellent	Above average	Average	Below average	Poor
<b>14-15</b>	>19.1sec	19.8-20.8sec	21.2sec	21.6sec	<21.6sec
<b>16-17</b>	<17.0sec	17.0-17.9sec	18.0-21.7sec	21.8-23se	>23.0

Sours Adapted from (Davis et al., 2000) Normative Evaluation

**Table7.12 B. Sprint or Speed Tests (30m Sprint run)**

Age	Excellent	Above average	Average	Below average	Poor
<b>14-15</b>	<4.7sec	4.7-4.9sec	5.00-5.2sec	5.3-5.5sec	>5.5
<b>16-17</b>	<4.5sec	4.5 - 4.6sec	4.7 - 4.8sec	4.9 - 5.0se	>5.0Sec

Source: Adapted from (Davis, 2000), National Norms

**Table7.13 C. Evaluating power test (Standing Long Jump Test or Broad Jump)**

Age	Excellent	Above average	Average	Below average	Poor
14	>1.91m	1.91 - 1.73m	1.72 - 1.60m	1.59 - 1.47m	<1.47m
15	>1.85m	1.84 - 1.73m	1.72 - 1.60m	1.59 - 1.50m	<1.50m
16	>1.83m	1.83 - 1.68m	1.67 - 1.58m	1.57 - 1.45m	<1.45m
>17	>1.91m	1.91 - 1.78m	1.77 - 1.63m	1.62 - 1.50m	<1.50m

Source: Adapted from (Davis, 2000), National Norms

**Table7. 14. Raw data score sheet for Experimental group**

Students Code	Sex	Age	RHR	MHR	WHR	EHR	Types of test								
							Illinois test (m/se)			30m Sprint run (m/se)			Broad jump (m)		
							Pre test	During test	Post test	Pre test	During test	Post test	Pre test	During test	Post test
001	F	14	73	206	133	153	22.44	21.63	20.42	6.50	5.20	4.96	1.78	1.87	1.91
002	F	14	69	206	137	151	22.75	21.58	21.20	6.76	5.28	4.98	1.45	1.58	1.65
003	F	14	67	206	139	150	24.81	22.74	21.17	5.83	4.24	4.20	1.42	1.52	1.72
004	F	15	67	205	129	153	23.28	21.93	21.50	6.72	5.17	4.76	1.45	1.60	1.73
005	F	17	74	203	129	151	22.73	22.52	21.70	7.72	4.47	4.23	1.45	1.64	1.78
006	F	16	73	204	131	152	22.48	21.42	20.30	5.82	4.56	4.44	1.46	1.70	1.76
007	F	15	76	205	129	153	23.42	21.73	21.50	5.68	4.82	4.65	1.76	1.84	1.90
008	F	15	67	205	138	150	22.80	21.43	20.22	5.98	4.63	4.32	1.77	1.87	1.87
009	F	15	68	205	137	150	21.90	21.18	20.85	5.78	4.42	4.15	1.70	1.80	1.84
010	F	16	74	204	130	152	23.83	22.23	20.43	5.93	4.78	4.05	1.55	1.63	1.74
011	F	17	78	203	125	153	22.84	21.62	20.74	5.56	4.25	4.13	1.50	1.61	1.68
012	F	15	73	205	132	152	21.83	20.94	20.19	6.03	5.63	4.54	1.70	1.82	1.90

013	F	15	75	205	130	153	22.30	21.78	21.14	5.77	4.73	4.24	1.50	1.58	1.67
014	F	14	73	206	133	153	23.49	22.34	21.43	6.53	5.48	4.62	1.40	1.54	1.68
015	F	15	70	205	135	151	23.04	21.57	20.80	6.32	4.98	4.46	1.68	1.72	1.87

**Table7.15** Raw data Sore sheet for Comparison group

Students Code	Sex	Age	RHR	MHR	WHR	EHR	Types of test								
							Illinois test (m/se)			30m Sprint run (m/se)			Broad jump (m)		
							Pre test	During test	Post test	Pre test	During test	Post test	Pre test	During test	Post test
001	F	15	73	205	132	152	24.32	24.30	24.28	6.42	6.30	6.37	1.43	1.40	1.45
002	F	15	74	205	131	153	23.43	23.40	23.40	7.82	7.85	7.80	1.54	1.56	1.58
003	F	16	73	204	132	152	22.97	22.95	22.90	6.93	6.90	6.85	1.58	1.58	1.49
004	F	14	70	206	136	152	24.47	24.48	24.40	6.73	6.68	6.70	1.48	1.41	1.50
005	F	14	69	206	137	151	23.53	23.65	23.53	6.78	6.74	6.73	1.63	1.60	1.65
006	F	17	75	203	128	152	23.84	23.84	23.80	6.53	6.50	6.52	1.54	1.57	1.55
007	F	15	74	205	131	153	24.15	24.20	24.50	5.98	5.97	5.95	1.57	1.60	1.58
008	F	15	76	205	129	153	23.75	23.70	23.80	6.32	6.34	6.33	1.68	1.69	1.65
009	F	16	74	204	130	152	22.93	22.83	22.58	6.47	6.40	6.43	1.44	1.45	1.52

010	F	16	72	204	132	151	23.47	23.35	23.38	6.56	6.58	6.53	1.53	1.50	1.60
011	F	17	71	203	132	150	24.81	24.53	24.70	5.83	5.80	5.78	1.56	1.57	1.60
012	F	14	68	206	138	151	24.71	24.65	24.68	6.78	6.75	6.76	1.60	1.65	1.63
013	F	14	70	206	136	152	23.98	24.00	23.73	6.97	6.98	6.95	1.48	1.52	1.54
014	F	16	76	204	128	153	24.05	23.95	23.98	6.35	6.30	6.32	1.54	1.56	1.60
015	F	15	77	205	128	154	24.93	24.50	24.00	6.58	6.57	6.55	1.62	1.60	1.55

## Appendix-B

### Description Training Schedule

The main objectives of this training schedule are to examine the effects of regular exercises on selected skill related physical fitness components: The case of Abyssinia Secondary school female students. The actual training time for each session is 40 minutes. The regular exercise is planned for 12 weeks from October, 2024-January 2025. The frequency of the exercise was 3 days per weeks and duration of exercise were 40 minutes per each session and intensity from low to moderate (55-69 maximum heart rates). Activities like warming up, walking, jogging, stretching, agility, sprint run, power activities and cooling down are included. Based on the training principles the researcher gradually increases duration and intensity of exercise in the given 12 weeks of training session.

**Frequency:** 3 days per week Monday, Wednesday and Friday of each week. But set and repetition would be increased through training.

**Duration:** 40 minutes per session.

**Intensity:** The intensity of exercise was gradually increasing low to moderate during training. The researcher selected carefully the intensity of exercise from low to moderate 55-69% maximum heart rate

Depending on the above basic information the researcher prepared training plan for three months as follows.

**Table 7.16 First Month Training Schedule (October, 2024)**

Training Days	Types of Exercises	Duration (40min)	Set and Repetition	Rest	Intensity of exercises
Monday	<b>Warming up</b> exercises: Different types of exercise for General warming up and specific warming up would employ.	9 min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Standing long jump, Illinois agility test	10 min	1*2		
	30 m speed run, running b/n cones	10min	1*2		
	<b>Cooling down:</b> different types of stretching exercises	5 min	1*1		

Wednesday	<b>Warming up</b> exercises: Different types of exercise for general and specific warming up will employ with in this session.	9min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Long jump, Sprint run, vertical jump	10min	1*2		
	Running b/n cones	10min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		
Friday	<b>Warming up exercise general and specific warming up sessions.</b>	9 min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Broad jump, zigzag run, sprint run	10min	1*2		
	Aerobic conditioning with jogging	10 min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		

**Table7. 17. Second Month Training Schedule (November, 2024)**

Training Days	Types of Exercises	Duration (40min)	Set and Repetition	Rest	Intensity of exercises
Monday	<b>Warming up</b> exercises: Different types of exercise for General warming up and specific warming up would employ.	9 min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Standing long jump, Illinois agility test	10 min	1*2		
	30 m speed run, running b/n cones	10min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		

Wednesday	<b>Warming up</b> exercises: Different types of exercise for general and specific warming up will employ with in this session.	9min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Long jump, Sprint run, vertical jump	10min	1*2		
	Running b/n cones	10min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		
Friday	<b>Warming up exercise general and specific warming up sessions.</b>	9 min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Broad jump, zigzag run, sprint run	10min	1*2		
	Aerobic conditioning with jogging	10 min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		

**Table 7.18 Third Month Training Schedule (December, 2024)**

Training Days	Types of Exercises	Duration (40min)	Set and Repetition	Rest	Intensity of exercises
Monday	<b>Warming up</b> exercises: Different types of exercise for General warming up and specific warming up would employ.	9 min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Standing long jump, Illinois agility test	10 min	1*2		
	30 m speed run, running b/n cones	10min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		

Wednesday	<b>Warming up</b> exercises: Different types of exercise for general and specific warming up will employ with in this session.	9min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Long jump, Sprint run, vertical jump	10min	1*2		
	Running b/n cones	10min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		
Friday	<b>Warming up exercise general and specific warming up sessions.</b>	9 min	1*1	1 minute active rest between each exercise	Low to Moderate intensity (55-69 MHR%)
	<b>Main Session</b>	20'			
	Broad jump, zigzag run, sprint run	10min	1*2		
	Aerobic conditioning with jogging	10 min	1*2		
	<b>Cooling down: different types of stretching exercises</b>	5 min	1*1		