COMPARISON OF SKILL RELATED PHYSICAL FITNESS COMPONENTS BETWEEN SPORT SCIENCE AND BIOLOGY DEPARTMENTS THIRD YEAR STUDENTS AT WACHEMO UNIVERSITY HOSSANA, SNNPR, ETHIOPIA

MSC THESIS

BY

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Comparison of Skill Related Physical Fitness Components between Sport Science and Biology Departments Third Year Students at Wachemo University, Hosanna, SNNPR, Ethiopia

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APPROVAL SHEET

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As Thesis Research advisors, we here by certify that I have read and evaluated this thesis work prepared under our guidance, by **Mengistu Debela Sundado** entitled: **"Comparison of Skill Related Physical Fitness Components between Sport Science and Biology Departments Students at Wachemo University, Hossana SNNPR, Ethiopia."** We recommend that it can be submitted as fulfilling thesis requirements for the degree of **Master Science in Sport Medicine.**

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As member of the board of examiners of the MSc Thesis Open Defense Examination, I certify that I have read evaluated the MSc Thesis Research prepared by **Mengistu Debela Sundado** and examined the candidate. I recommended that the MSc Thesis research was accepted as fulfilling the MSc Thesis research requirement for the Degree of **Master of Science in Sport Medicine.**

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Final approval and acceptance of the thesis is contingent upon the submission of its final copy to the council of Graduate Studies (CGS) through the candidates department or school graduate committee (DGC or SGC).

DEDICATION

I dedicated this thesis manuscript to my wife Tigist Gebermariam, my brothers Tariku Debela, Tamene Betebo and my sister Amerech Debela and Malagireta Wolidemariam for their entire contribution and being partner in my success.

STATEMENT OF THE AUTHOR

First, I declared that this thesis is my genuine work and that all source of materials used for this thesis have been duly acknowledged. This thesis has been submitted in partial fulfillment of the requirements for the degree of master of science in sport medicine at Haramaya University in deposited at the university library to be made available to borrowers under rules of library. I solemnly declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

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BIOGRAPHICAL SKETCH

The Author was born on 01 September, 1992 E.C from his father Debela Sundado and his mother Takore Bokalo in Hosanna, Hadiyya Zone of SNNPR. He attended his junior elementary school education at Jacho and his secondary school education at Mudulla Senior Secondary and his preparatory school at Mudulla Senior Secondary and preparatory school. Then, he joined Hawassa University, College of natural science and computational science, department of sport science in 2011 E.C and graduated with BSc, degree in sport science in June 2013 E.C. After graduation he was started PDGT programs for one year in regular programs and he was employed in 2015 E.C by Hadiyya zone Duna Woreda Densehafule secondary school as a teacher from July 2015 E.C to June 2017 E.C and he served for three years, after serving three years at Hadiyya zone Duna Woreda Densehafule secondary school. And again he joined the School of Graduate Studies of Haramaya University in September 2018 E.C to process his MSc study in Sport Medicine.

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ACRONYMS AND ABBREVIATIONS

ACSM	American College of Sports Medicine
PT	Pretest
SD	Standard Division
SNNPR	Southern Nations, Nationalities, and Peoples' Region
SPSS	Statistical Package for social sciences
WU	Wachemo University

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ABSTRACT

This study was aimed to compare skill related physical fitness components of Wachemo university Sport Science and Biology department students. The study was conducted in Wachemo University Sport Science and Biology department Students. Cross-sectional study design was used because the subjects were tested once. For this study 64 subjects were screened using Stratify random sampling technique. The quantitative data was collected through anthropometric and skill related physical fitness tests. Mean and standard deviation were computed for age, sex, weight, height, Illinois agility test, stroke balance test eye hand coordination test vertical jump test, ruler drop test and 30meter dash test. Moreover, multiple comparison tests was used to examine the skill related physical fitness components. The significance level was set at P< 0.05 for each of the statistical tests. The SPSS version 20 software was used for the statistical analysis. The mean results of above mentioned tests in both male and female Sport and Biology departments third year Students was compared with international norms.Both maleand female Sport Science Students showed significance differences than Biology Students except stroke balance and vertical jump test for male and ruler drop test for female. These three components were equal value as compare with international norms, but ruler drop test female showed significant difference in statically. This finding showed that regular sport activities were significantly enhanced the physical fitness components. The finding showed that Sport Science students had significant improvement and physically fit than the Biology Department third year Students of Wachemo University.

Key words: skill related physical fitness components.

1. INTRODUCTION

1.1. Back Ground of the Study

Fundamental movement patterns develop during preschool ages and with maturation and growth, these movement skills progressively become integrated and coordinated into more difficult Physical activity performances that characterize different free play and games through school years (Strong *et al*., 2005).

Physical activity is essential for healthy growth and development, and has been associated with physical, psychosocial; however physical inactivity is a growing public health concern and in addition to the increased morbidity is responsible for large economic burden. Physical fitness is a set of attributes that people have or achieve. Being physically fit has been defined as the ability without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies, but it is modifiable through exercise training within individual's intra-variability. The most frequently cited components fall into two groups: one related to health and the other related to skills (Timmons *et al.*, 2012).

Therefore, promoting physical activity, especially across the lifespan, is a key public health priority (Cavill *et al.*, 2001). Skill related components of fitness are the ability to change the direction of body oritsparts rapidly is dependent on strength, reaction time, speed of movement and muscular coordination. Quick start and stops and quick changes in direction are fundamental to good performance in Football (Singh, 2010).

Explosive power, together with reaction time, decides the results of competitions in the first 2–3 meters of sprint. Skill related physical fitness is portion of physical fitness which is directed toward optimizing athletic performance(Fernandez-Fernandez *et al*., 2014).It is less related to good health and more related to ability to learn sport and other kinds of physical skill (Caspersen *et al*., 1985).Skill-related physical fitness is needed for success in athletics and lifetime sport and activities. Fitness components important for success in skillful activities and athletic events; encompasses agility, balance, coordination, power, reaction time, and speed (Hoeger, 2009).

1.2. Statements of the Problem

Physical fitness is essential; therefore it is the responsibility of every country to promote physical fitness of its citizens because physical fitness is the basic requirements for the tasks to be under taken by an individual in his life (Manley, 1996).

Testing skill related physical fitness components of sport science students may provide the teacher determine the level of students many researchers for some selected physical fitness, but no one study for skill related fitness components. The evaluation of these tests can help the teachers to decide the current level of Sport Science and Biology department students on skill related physical fitness components performance, while it is not clear as to what extent this influence the current status of the students. It is possible that this compression may become a useful tool to a teacher in determining the current status of the students. There was having a considerable assumption and discussion about the current physical attribute of the students (Berg *et al.*, 1990).

Thus, the researcher assume that; Wachemo University (WU) sport science and biology department students may or may not fulfill in the compression of skill related physical fitness components as compared with the international norms. Therefore, the purpose of this study was to compare the skill related physical fitness components of WU sport science students and biology department students as compared with the international norms.

Having the above-mentioned reasons the researcher is trying to answer the following basic research questions:

1. What are the skills related physical fitness statuses of sport science department students and biology department students?
2. Does the significant difference between the skills related physical fitness of sport science third year and biology department third year students?
3. Does the performance of sport science and biology students fulfill the international standards of skill related physical fitness components?

1.3. Scope of the Study

This study was delimited to WU Sport Sciences and biology students who are active and free from any disease, physical deformity, first and second year Sport science and biology students were not included. The paper also delimits both male and female sport science and biology third year students of WU.

1.4. Limitation of the Study

In the course of the study the researcher encountered several problems some of them were.

- Shortage time, Financial and materials constraint.
- Shortage imperial researches that are conducted on the topic in Ethiopia.
- Shortage of accurate instrument, equipments and related problems.

1.5. Significance of the Study

The aim of this study is to assess the skill related physical fitness components of WU Sport Science and Biology department students. For both Sport Science and Biology Students, important to get reliable information about the benefit of skill related components of physical fitness in order to improve physical performance.

This study have certain outcomes that which help to discover or to reach conclusions and helps to select the students who want to join sport science department, which shows the physical performance of students, and also helps to improve the challenges for setting criteria to join sport science department. Finally, this study would be helpful for other researchers as baseline information for future. It is useful to prepare physical fitness activity for male and female students in sport science and other departments for improving their physical fitness and keeping them to maintain their performances.

1.6. Objectives of the Study

1.6.1. General objective

- To compare skill related physical fitness components of WU male and female sport science and biology students with the international norms

1.6.2. Specific Objectives

- To assess the skill related physical fitness status of sport science department students and biology department students.
- To examine the significant difference of skill related physical fitness between sport science and biology department third year students.
- To compare the physical fitness performance of sport science and biology department students with international norms.

2. REVIEW OF RELATED LITERATURE

2.1. Physical Activity

The term “Physical activity” is not equal to “exercise”. Exercise is a subcategory of physical activity which is structured, repetitive, and purposeful. “A sound body has a sound mind” It means that if a person is weak, dull, and sick, he is not able to do his work efficiently and quickly. It is very important to have a fresh mind before any work, like office work, study or some creative work. The people who make exercise as essential part of their routine are more happy and efficient than others. Exercise does not mean to go to gym or some club for daily activity; it only means to do some physical activity no matter how and where. Exercise is useful in preventing or treating coronary heart disease, osteoporosis, weakness, diabetes, obesity, and depression. Strengthening exercises provide appropriate resistance to the muscles to increase endurance and strength. Cardiac rehabilitation exercises are developed and individualized to improve the cardiovascular system for prevention and rehabilitation of cardiac disorders and diseases (Rogers *et al.,* 2018*).*

Physical activity includes all types of movement, from the smallest to the most complex. It may be voluntary, (including structured physical activity, planned, relatively limited in time and implemented to improve certain attributes of physical fitness or energy expenditure) or daily life activities (which includes walking, household, occupational activities or transportation(Powell *et al.*,2011).

It can be typically involuntary and spontaneous, from small body movements, like a blink of an eye, to all muscle contractions associated with different postures of the body. However, it is difficult to assess and quantify separately these different physical activity domains, which leads them to being considered together (Kahn *et al.,* 2002).

2.2. Enhanced Focus on Physical Activity

There appears to be increasing support towards the promotion of physical activity as well as physical fitness Corbin(2002) suggested that fitness benefits will likely follow if physical educators incorporate higher levels of physical activity into their lessons. He argues that

physical educators actually have less control over students' fitness parameters than previously thought; uncontrollable factors such as heredity and maturation play major roles. Moreover, many children become turned off when pushed to get fit (Corbin *et al.,* 1999).

Thus, encouraging students to do some physical activity at various levels of intensity may appeal to a larger majority of students. Given the limits of curricular time for physical education, shifting emphasis toward increased physical activity (rather than specific target amounts of physical activity) provides an achievable outcome for all students, regardless of their fitness levels (Ng *et al.*, 2006).

2.3. The Concept of Physical Fitness

Concept of physical fitness is as old as mankind, keeping in mind the survival of the fittest, down through the ages, only strong and agile people could defend invaders, protects themselves and their property. It is ahard fact that physically fit people are in a better position to bear the rigorous and abnormal stress and strain than those who are less physically fit (Gill *et al.*, 2010).

2.4. Definitions and Types of Physical Fitness

Physical fitness is the capacity to carry out, reasonably well, various forms of physical activities, without being unduly tired and includes qualities important to the individual's health and wellbeing. Every person has a different level of physical fitness which may change with time, place of work, situation and there is also an interaction between the daily activities, and the fitness of an individual, the point if where to put the level of optimum fitness. From the physiological point of view physical fitness may say to be ability at the body to adopt and recover from strenuous(Garatachea *et al*., 2009).

Also it can be defined as the ability to meet life's daily demands, without undue fatigue, while maintaining sufficient energy for leisure time pursuits and to overcome emergency situations that may arise personally and professionally (Haskell and Kiernan, 2000).

Physical Fitness Research has suggested that there may be optimal periods within a player's growth and development when it is best to build upon them. It is possible that if these attributes are not put under sufficient stress during these opportunity a player may not realize his or her full performance potential (Reilly *et al*., 2001).

Physical fitness is to the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us look; Physical fitness is to the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us look, feel and do our best performance up to our potential. Fitness can be described as a condition that helps us look, feel and do our best. Physical fitness involves the performance of the heart and lungs, and the muscles of the body. And, since what we do with our bodies also affects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and body (Petajan *et al*., 1996).

Physical fitness of school students is major factor to be considered. So, School physical education programmers should include multi furious activities appropriate to each age group. The complex nature of physical fitness can best understood in terms of its components such as cardio-vascular endurance, strength, flexibility and muscular endurance. In addition to these components of physical fitness has two dimensions vizhealth related fitness and motor fitness (Malina *et al.*, 1996).

Now that you've learned about skills, it's important that you learn about skill-related fitness. Skill related fitness refers to abilities that help people learn skills. The six parts of skill related fitness agility, balance, coordination, power, reaction time, and speed are described in table Skill-related fitness isn't the same as skill. Having good skill related fitness does help you to learn skills. For example, balance is important in many activities. If you have good balance, you'll be able to learn specific skills, such as in line skating, more easily than if balance is hard for you. Different people have different skill related fitness abilities based on their heredity(Corbin and Masurier, 2014).

2.5. Benefits of Exercise:

Regular exercise and physical activity are important to the physical and mental health of almost everyone, including older adults. Being physically active can help you continue to do the things you enjoy and stay independent as you age. Regular physical activity over long periods of time can produce long-term health benefits. That's why health experts say that older adults should be active every day to maintain their health. In addition, regular exercise and physical activity can reduce the risk of developing some diseases and disabilities that develop as people grow older. In some cases, exercise is an effective treatment for many chronic conditions. For example, studies show that people with arthritis, heart disease, or diabetes benefit from regular exercise (American Diabetes Association, 2003).

Exercise also helps people with high blood pressure, balance problems, or difficultywalking gives you some specific activities and exercises, including exercises to increase your strength, improve balance, become more flexible, and increase endurance. All of the exercises have easy directions to help you do them safely (Seco *et al*., 2013).

You want to do more physical activity for a specific skill-related event or goal; you need to consider the six skill-related fitness components. These components, sometimes referred to as sport-related fitness components, include power, speed, agility, hand eye coordination, balance, and reaction time (Hands *et al*., 2015).

2.6. Skill Related Physical Fitness

Physical fitness is required not only by athletes for better performance, but also by non-athletes for maintenance of a healthy body and healthy mind (Shephard, 1997).How students feel about themselves can be influenced by their physical skills. Students who have achieved fundamental motor skill competence have been found to perceive themselves as being competent, socially accepted and to have a positive attitude towards physical activity. In essence, fundamental motor skill competence assists in preparing students for a healthy lifestyle (Valentini and Rudisill, 2004).

2.7. Components of Physical Fitness

The development of a high level of functional capacity for necessary and discretionary tasks of life and the maintenance or enhancement of physiological functions in biological systems that are not involved in performance but are influenced by habitual activity (Kokkinos, 2012).

Maintaining an appropriate level of health related fitness allows a person to meet emerge, reduce the risk of disease and injury, work efficiently, Participate and enjoy physical activity (sports, recreation, leisure), look one's physical best conducted the study in Poland that showed that engaging in moderate physical activity is very important for the primary prevention of chronic diseases, decreasing all causes of mortality and that exercise is one of the determinants for physical and psychological well-being. And six performance related physical fitness (speed, agility, power, coordination, reaction time, balance (Saris *et al*., 2013).

3. MATERIALS AND METHODS

3.1. Description of the Study Area

The study was conducted at WU, WU is found in Hossana town of Hadiyya administrative zone in SNNPRS. Hossana town is 230kms away from Addis Ababa, and the University is 3kms away from the center of the town. The topographic feature of the town is of both plain and plateau lands, and this has contributed to its natural scenery. Being suitable for living and showing progress from time to time, it has been considered as one of the fast growing cities among the 22 reform cities in the region, with an average elevation of 2276 m above sea level. The town has a total area of 23 km^2 and lies between $7^o33'N$ latitude and $37^o51'06.67''E$ longitudes (https://en.wikipedia.org/wiki/Hosaena).

3.2. The Study Design

Experimental design was used to explore the comparison of skill related physical fitness components between sport science and biology department students at Wachemo University Hossana, Ethiopia.

3.3. Source of Data

The researcher was used the primary sources of data according to the nature of the problem. The primary data was taken from experimental variables.

3.4. The Study Population

The sources of population were Wachemo University College of natural and computational science with biology and sport science 3^{rd} year students. The sample and population of the study is concerned, the researcher were selected 64 sport science students and 64 third year biology students, among them 32 from female and 32 male students had been selected from sport science and some followed at sport science. The overall both the biology and sport science students had been selected equally in gender, all the subject was involved in compression of the study. The variable of the study were selected such as agility, balance,

coordination, power, reaction time and speed. The study was contains 16 female and 16 male was included in both departments such as sport science and biology.

3.5. Sample and Sampling Techniques

For this study stratified random sampling was used to select subjects. The total number of female and male students who fulfilled inclusion criteria was 128. To select appropriate representative from those female and male students' two strata were made and they were grouped into Biology class and Sport Science class and they were considered as Pb and Ps respectively and then the following formula was conducted.

$$n_1 = \frac{n\,(p_1)}{N}$$

- Where n_1= sample size for stratum P_b

n = sample size drawn from the total population

N=total number of Population

P_b= Population size of Biology class

P_s= Population size of sport science class

- ✓ Sample size for Biology class

N=128, Pb= 64, n=64

$$n_1 = \frac{n\,(Pb)}{N}$$

$$n_1 = \frac{64(64)}{128}$$

n_1=32

- ✓ Sample size for sport science class
- ✓ N=128, ps= 64, n=64

$$n_2 = \frac{n\,(Ps)}{N}$$

$$n_2 = \frac{64(64)}{128}$$

n_2=32

- Hence , after selecting sample size the investigator was selected 16 female and 16 male students from Biology and 16 female and 16 male students from Sport Science purposively.

3.6. Materials

For this study WU football field was used for pre-test as well as to compare the pre-test. The materials for investigator which are pen, paper, and score sheet, ruler, stopwatch, wishtile, and cones were used.

3.7. Inclusion Criteria

All of the selected participants was included as the study population those who were sport science third year and biology department third year students of WU. Those who ranged there age from 19-24 included in the study.

3.8. Exclusion Criteria

Those who are not sport science and biology students of WU and who are not volunteer to participate in this study was excluded from the study. In addition to these students with illness or injury and for female students with in the case of pregnancy was excluded from the study. In addition to this first and second year sport science and biology students excluded.

3.9. Variables of the Study

The researcher was conducted the study only on the skill related components of physical fitness. Skill Related Components are:

1 .Agility 4. Power

2. Balance. 5. Reaction time

3. Coordination 6. Speed

3.10. Definition of Variables

Skill-related physical fitness consists of those components of physical fitness that have a relationship with enhanced performance in sports and motor skills. The components are commonly defined as:

Agility: That relates to the ability to rapidly change the position of the entire body in space with speed and accuracy (Young *et al*., 2002).

Balance: That relates to the maintenance of equilibrium while stationary or moving (Maki *et al*., 1997)

Coordination: That relates to the ability to use the senses, such as sight and hearing, together with body parts in performing motor tasks smoothly and accurately (Sebanz*et al*., 2006)

Power: is the ability to move the body parts swiftly while applying the maximum force of the muscles. Power is a combination of both speed and muscular strength (Newton *et al.*, 1994).

For example, fullbacks in football muscling their way through other players and speeding to advance the ball and volleyball players getting up to the net and lifting their bodies high into the air (Newton *et al*., 1994).

Speed: That relates to the ability to perform a movement within a short period of time (Cronin and Hansen, 2005).

Reaction time: that relates to the time elapsed between stimulation and the beginning of the reaction to it Academic achievement is the indicator of the students' level of acquired knowledge or skill, which has been gained as a result of training or experience. Academic achievement has been defined as the level of attainment of proficiency in academic work as evaluated by teacher or through standardized achievement tests (Gabbett*et al.*, 2009).

3.11. Data Quality Control

Data was collected by the researcher and five assistance (degree holders) for the field tests. To avoid errors, training was given for the assistance data collectors on how to use the data collecting instruments and measurements during data collection. Only standardized tests and materials were used to keep the quality of the data. Additionally, all the mentioned tests were recorded on score sheet. Finally the data was coded and fed to software twice to avoid error in data feeding.

3.12. Methods and Procedures of Data Collection

The quantitative data was collected through anthropometric and variables test like skill related physical fitness components to know the characteristics of the students and through skill related physical fitness tests; like power, speed, agility, reaction time, coordination, and balance, test to measure, the data was used the international norms of the above physical fitness tests and it was used to compare the results of fitness test (Livak and Schmittgen, 2001).

Table 1 - Variables and appropriate test for the study

No.	Skill Related Components	Test for the Variables
	Agility	Illinois Agility test
	Balance	Stroke Balance Test
	Coordination	-Eye hand coordination test
		-Eye Foot coordination test
	Power	Vertical Jump Test
	Reaction time	Ruler Drop Test
	Speed	meter dash test

3.12.1. Tests for Agility (Illinois Agility test)

Illinois Agility test: The objective of the Illinois Agility Run Test is to monitor the development of the athlete's agility. Agility is an important component of many team sports, though it is not always tested, and is often difficult to interpret results. The Illinois Agility test is a commonly used test of agility in sports, and as such there are many norms available. The average running score for males are between 18.1-16.2 seconds and females are between 21.718.0 seconds (Hachana *et* al., 2013).

3.12.2. Test Balance (stroke balance test)

The stroke balance test requires the person to stand on one leg. The purpose of this test was to compare the ability to balance on the ball of the foot. For this test the subject are asked to remove the shoes and place the hands on the hips, then position the non supporting foot against the inside knee of the supporting leg. The subject is given one minute to practice the balance, then the raise the heel to balance on the ball of the foot. The stop watch was started as the heel goes up from the floor. The stop watch stopped if any of the following occurs:

The hand comes of the hips, the supporting foot swivels in any direction; none supporting foot loss contact with the knee. The hell of the supporting foot touches the floor. The total time in seconded will be recorded. The score were the best of three attempts (Shiferaw, 2013).

3.12.3. Test for Coordination (eye hand coordination test).

Coordination is the ability to move two or more body parts under control, smoothly and efficiently. Coordination is typically measured using tests of hand-eye or foot-eye coordination such as throwing, catching or bouncing a ball, or hitting an object. Manual dexterity tests or tests of hand-eye coordination also fall into this category. Usually people have better coordination on one side of the body than the other not many people can throw and catch equally well with either hand! As an example of a coordination test, the Wall-Toss Test of hand-eye coordination (Geslak, 2014)

3.12.4. Test for Power (vertical jump test).

The purpose of this test was to measure the power. For this test the performer are asked to stand with one side near the wall, heels close together then he/she extent the arm near to the wall without raising the heels and make a mark on the wall. Then he/she was suppose to take a crouch position and jump up as high as possible and makes another mark. The distance between first and second mark was measured. Three trails will be given and the best result out of three will be recorded as his /she score (Shiferaw, 2013).

3.12.5. Test of Reaction Time (ruler drop test)

One way we can test reaction time in lab is by measuring the time it takes to catch a ruler dropped by an accomplice (Martin, *et al*., 1993).

1. Subject should hold out the chosen hand and extend the thumb and index finger so they are 8 cm apart.

2. Accomplice hold a metric ruler with its end exactly even with the subject’s extended thumb and index finger. The ruler should be vertical with lowest numbers near the subject’s hand.

3. The ruler is dropped, and the subject grasps it between the thumb and index finger.

4. Record the number at the subject's fingertips, i.e. distance the ruler fell through the subject's fingers.

5. Calculate the time it took for the subject to react and catch the falling ruler and the best result out of three will be recorded as his/her score.

3.12.6. Test for Speed (30 Meter Dash test)

Sprint or speed tests can be performed over varying distances, depending on the factors being tested and the relevance to the sport **(**Baker and Newton, 2008).

3.12.7. Methods of Data Analysis'

In analysis of data, SPSS (version 20) package software was used. Age, height and weight values of the research participants was given as averages (mean) and standard deviations, and in the comparison of pre-test and Paired- Sample't' test was be used. The statistical significance level was being 0.05.For each of the statistical tests.

3.12.8. Ethical Issues and Code of Conduct.

The study deals with the ethical issues; it cares for the privacy of research participants and makes guarantees and confidentiality in risk of harm as a result of their participation. Therefore the study was conducted according to Haramaya University rules, regulations, policies and codes of ethics relating to research ethics. Ethical standards require that researcher should not impose participants in a situation where they might be at risk of physical or psychological harm as a result of their participation.

4. RESULTS AND DISCUSSION

4.1. Demographic Characteristics of the Study Participants

A total of sixty four sport science and biology 3rd year regular students were participated in the study. All the study subjects were taken anthropometric test like age, height and weight to know their characteristics and physical fitness tests; like Illinois agility test to measure agility, stroke balance test to monitor the development of the athlete's ability to maintain a state of equilibrium to know the students balance. Eye hand Coordination test to monitor the ability of the athlete's vision system to coordinate the information received through the eyes to control, guide, and direct the hand in the accomplishment of tossing a ball to the wall (eye-hand coordination). Vertical jump test to measure Vertical Jump is used to measure a client's lower limb. This page shows you how to conduct this. This test is designed to measure lower limb explosive power by measuring the height a client is able to jump. Ruler drop reaction time to measure reaction time and determine just how speedy you really are. 30 meter dash runs test to determine acceleration and peed.

4.2. Anthropometric Test Result and Discussion

Table 2 Anthropometric Characteristics of Wachemo University Sport Science and Biology third year.

Anthropometric characteristics *Mean* ± *SD*				
Department and Year	Sample	Age	Height	Weight
Sport science 3rd year female	16	21.56±*1.50*	1.52±*0.50*	50.95±*2.83*
Biology 3rd year female	16	22±*1.59*	1.54±*0.52*	53±*4.78*
Sport science 3rd year male	16	22.43±*1.54*	1.60±*0.58*	57.87±*4.2*
Biology 3rd year male	16	22.62±*1.2*	1.61±*0.04*	61.25±*3.45*

Mean ± SD in the same columns in each parameter are significantly different ($p<0.05$), Height (m) = height in meter, Weight (kg) = weight in kilogram.

Table 4 showed that the mean value of anthropometric characteristics of both male and female sport science and biology students of third year. As result indicated the mean value of age in female sport science third year and biology third year female students 'were *21.56* and 22 years old respectively. And also the mean value of anthropometric characteristics of male sport science students of third year and biology third year. As result indicated the mean value of age in male sport science third year and biology third year male students 'were 22.43and 22.62 years old respectively. So no Significant difference between sport science and biology department students both male and female statically.

The mean value of height in female third year sport science and biology third year female students' were 1.52 m and 1.54 m respectively and mean value of height in male third year sport science and biology third year male students' were 1.60 m and 1.61m respectively**.** As result indicated that there is no significance difference between both male and female students in height. The mean value of weight for third year sport science female and biology female 50.95 kg and53 kg respectively. Then the mean value of weight for third year sport science male and biology male 57.87 kgand61.25 kg respectively. In this test there is no significant difference between sport science and biology third year students. This result is also similar to research conducted on assessment of some selected physical fitness components of Jimma university sport science department students reveal that there is no significance difference in anthropometric difference (Mengistu, 2015).

4.3. Physical Fitness Tests Result and Discussion

Table 3 the Mean Value of Physical Fitness Tests of Wachemo University Sport Science

Physical Fitness Tests in Mean ± SD							
Department and Years	N	Agility	Balance	Coordination	Power	Reaction Time	Speed
Sport science 3rd d year female	16	20.54±2.34	29±5.72	17.68±4.33	10.87±5	20.82±5	4.7±0.19
Biology 3rd year female	16	22.45±0.52	23.61±10.41	14.31±2.0	7.68±3.71	24±3.58	4.9±0.49
Sport science 3rd year male	16	15.94±1	42.81±5.6	33.62±1.99	19±3	13.75±4.73	4±0.09
Biology 3rd year male	16	18.38±1.28	40.8±7.17	26.87±3.96	17.31±2.79	17.54±7.16	4.3±0.20

Table 4 The Mean Difference Values of the Variables Test study

Variable	Department											
	Sport science and biology female				95% confident interval		Sport science and biology male				95% confident interval	
	Sport female	Biology female	Mean dif	Sig	Lower	Upper	Sport male	Biology male	Mean dif	Sig	Lower	Upper
Agility	20.54	22.45	-1.91	.00	-4.15	-1.63	15.94	18.38	-2.44	0.00	-3.17	-1.71
Balance	29	23.61	5.39	.088	-89	11.6	42.81	40.8	2.01	0.28	-1.81	5.81
Coordination	17.68	14.31	3.37	.003	1.31	5.4	33.62	26.87	6.75	0.00	4.69	8.8
Power	10.87	7.68	3.19	.078	-40	6.7	19	17.31	1.69	0.16	-72	4.12
Reaction time	20.82	24	-3.18	.005	-5.54	-1.19	23.75	17.54	-3.79	0.30	-7.16	-4.2
Speed	4.7	4.9	-0.2	.112	-50	0.59	4	4.3	-0.3	0.00	-43	-168

Table 5 Comparative Analysis of Illinois Agility Test between Sport Science Female and Biology Female Students

Group	Sample	Mean	S.D
Sport science female	16	20.54	*±2.34*
Biology Female	16	22.45	*±0.52*

The analysis of table 7 shows that the mean and standard deviation value on the agility variable of the sport science and biology female's students were recorded as 20.54, *±2.34* and 22.45, *±0.52* respectively.It shows that sport science female students have performed average and biology students have performed below average as compared normative data and better as Compared to their biology department students. It has been observed that the mean score of sport science is higher than biology department students. Mean score of Illinois agility test is below average for biology participants as compared to sport science female students. The researcher conclusion that sport science female students have better agility than biology department students and their have the significance difference between sport science female students and biology, as compare to the below normative data.

Table 6 Illinois Agility Test Norms for Female

Age 18-25

	Females (seconds)
Excellent	< 17.0
Above average	17.0 - 17.9
Average	18.0 - 21.7 average
Below average	21.8 - 23.0 below average
Poor	> 23.0

Williams, (2001).

As compared with the international norms the results of female sport science students were scored well. But biology female students were scored below average.

Table 7 Comparative Analysis of Agility between Sport Science and Biology Male Students.

Group	Sample	Mean	S.D
Sport science male	16	15.94	±*1*
Biology male	16	18.38	±*1.28*

The analysis of table 9 shows that the mean and standard deviation value on the agility variable of the sport science and biology male students were recorded as 15.94, ±*1* and 18.38, ±*1.28* respectively. It shows that sport science department students have performed above average as compared standard norms. And sport science students male students have performed well and biology students have performed average as compared normative data and above average as Compared to their biology department students. It has been observed that the mean score of sport science is high from biology department students. Mean score of Illinois agility test is average for biology as compared to sport science male students'. Conclusion that sport science male students have better agility than biology department students and their have the significance difference between sport science male students and biology.

Table 8 Illinois Agility Test Norms for Male

Age 18-25

Rating	Males (seconds)
Excellent	< 15.2
Above average	15.2 - 16.1 above average
Average	16.2 - 18.1
Below average	18.2 - 19.3 below average
Poor	> 19.3

As compared with the international norms the results of male sport science students were scored above average. But biology male students were scored average.

Table 9 Comparative Analysis of Balance between Sport Science Female and Biology Female Students.

Group	Sample	Mean	S.D
Sport science female	16	29	±*5.72*
Biology female	16	23.61	±*10.65*

The analysis of table 11 shows that the mean and standard deviation value on the balance variable of the sport science female participants and biology participants in stroke balance test were recorded as 29, ±*5.72 and* 23.61±*10.41* respectively. It shows that the sport science female participants performed average and biology female have performed fair as compared to sport science participants in balance variable however not significance difference but sport department student perform better than biology department students. The researcher conclusion that sport science students have the average balance and biology fair in stroke balance test.

Table 10 Stroke Balance Norm (Both Male and Female)

Age 18-25

Rating	Score (seconds)
Excellent	> 50
Good	40 – 50
Average	25- 39 average
Fair	10 – 24 fair

(Isles *et al.,* 2004).

As compared with the international norms the results of female sport science students were scored average. But biology female students were scored fair.

Table 11 Comparative Analysis of Balance between Sport Science Male and Biology Male Students

Group	Sample	Mean	S.D
Sport science male	16	42.81	±*5.6*
Biology male	16	40.8	±*7.17*

The analysis of table 13 shows that the mean and standard deviation value on the balance variable of the sport science male students and biology male students in stroke balance test were recorded as 42.81, ±*5.6 and* 40.8, ±*7.17* respectively. It shows that the sport science male participants and biology male have performed the good average value as shows international norms compared to sport science male participants with biology in balance variable, so that no significance difference between sport science and biology male. Let as come to conclusion that sport science participants have the good average balance between sport science and biology students in stroke balance test, because of both of them were have general ability.

Table 12: Stroke Balance Norm (Both Male and Female)

Age 18-25

Rating	Score (seconds)
Excellent	> 50
Good	40 – 50 good
Average	25- 39
Fair	10 – 24

As compared with the international norms the results of male sport science students were scored good. But biology male students were scored good, so both departments have the same score.

Table 13 Comparative Analysis of Coordination between Sport Science Female and Biology Female Students

Group	Sample	Mean	S.D
Sport science female	16	17.68	*±4.33*
Biology female	16	14.31	*±2.0*

The analysis of table 15 shows that the mean, and standard deviation value on the Coordination variable of the spot science students and biology students were recorded as 17.68, *±4.33and* 14.31*±2.0 respectively*. It shows that the sport science female students have performed better as compared to biology students in coordination variable. From table 15 it has been observed international norms that the mean score of sport science students is performing better than biology participants. Mean score of eye-hand coordination test is lower for biology students as compared to sport science students, so the conclusion is that sport science students have better eye-hand coordination than biology students. So the sport science female students have significance difference between biology department students.

Table 14: Eye hand coordination norm (both male and female)

Age 18-25

Rating	Score (in30seconds)
Excellent	> 35
Good	30 – 35
Average	20- 29
Fair	15 – 19 fair
Poor	< 15 poor

(Masia and Morasso, 2009).

As compared With the international norms the results of Female Sport Science Students were scored fair, but Biology Female Students were scored poor.

Table 15 Comparative Analysis of Coordination between Sport Science Male and Biology Male Students

Group	Sample	Mean	S.D
Sport science male	16	33.62	±*1.99*
Biology male	16	26.87	±*3.96*

The analysis of table 17 shows that the mean and standard deviation value on the Coordination variable of the sport science students and biology students were recorded as 33.62, ±*1.99and* 26.87, ±*3.96* respectively. It shows that the sport science students have performed well as compared to biology students in coordination variable. From table 17 it has been observed that the mean score of sport science male participants is better than biology participants. Mean score of eye-hand coordination test is lower for biology participants as compared to sport science students. So the conclusion is that sport science students have good eye-hand coordination than biology students. The result indicates that there are significance difference between sport science students and biology department.

Table 16 Eye hand coordination norm (both male and female)

Age 18-25

Rating	Score (in30 seconds)
Excellent	> 35
Good	30 – 35 good
Average	20- 29 average
Fair	15 – 19
Poor	< 15

As compared with the international norms the results of male sport science students were scored well, but biology male students were scored average.

Table 17 Comparative Analysis of Power between Sport Science and Biology Female Students

Group	Sample	Mean	S.D
Sport science female	16	10.87	±*5*
Biology female	16	7.68	±*3.71*

The analysis of table 19 shows that the mean and standard deviation value on the power variable of the sport science students and biology students were recorded as 10.87, ±*5 and* 7.68**,** ±*3.71* respectively. It shows that the sport science students have performed below average. From table 19 it has been observed that the mean score of sport science female students is below average and biology students poor. Mean score of vertical jump test is lower for biology students as compared to sport science students. So the conclusion is that sport science students have better vertical jump than biology students. The result showed that there is significance difference between in both departments statistically.

Table 18 Vertical Jump norm for female (power)

Age 18-25

Rating	Females (inches)	(cm)	
Excellent	> 24	> 60	
very good	20 – 24	51-60	
above average	16 – 20	41-50	
Average	12 – 16	31-40	
below average	8 – 12	21-30	below average
Poor	4 – 8	11-20	poor
very poor	< 4	< 11	

(Patterson and Peterson, 2004).

As compared with the international norms the results of female sport science students were scored below average. But biology female students were scored poor.

Table 19 Comparative Analysis of Power between Sport Science and Biology 3rd year Male Students

Group	Sample	Mean	S.D
Sport science male	16	19	±*3*
Biology male	16	17.31	±*2.79*

The analysis of table 21 shows that the mean and standard deviation value on the power variable of the sport science students and biology students were recorded as *19, ±3 and* 17.31, *±2.79 respectively*. It showed that the sport science male students have performed average as compared to biology students in power variable. From table 21 it has been observed that the mean score of sport science male students and biology male were averaged the same Mean score of power test are the same average for biology students as compared to sport science students. So the conclusion is that sport science students have the similar value to biology students. So there no statistically significance difference between sport science and biology department in vertical jump test.

Table 20 Vertical Jumps norm for male (power)

Age 18-25

	Males		
Rating	(inches)	(cm)	
Excellent	> 28	> 70	
very good	24 – 28	61-70	
above average	20 – 24	51-60	
Average	16 – 20	41-50	average
below average	12 – 16	31-40	
Poor	8 – 12	21-30	
very poor	< 8	< 21	

As compared with the international norms the results of male sport science and biology students were scored the same average.

Table 21 Comparative Analysis of Reaction Time between Sport Science and Biology 3rd year Female Students

Group	Sample	Mean	S.D
Sport science female	16	20.82	±*5*
Biology female	16	24	±*3.58*

The analysis of table 23 shows that the mean and standard deviation value on the reaction time variable of the sport science students and biology students were recorded as 20.82, ±*5 and* 24, ±*3.58* respectively. It showed that the sport science female participants have performed below average as compared to biology students in reaction time variable. From table 23 it has been observed that the mean score of sport science female students is below average the same to biology students. The mean score of reaction time test both sport science and biology participants have below average as compared to international norms. So the conclusion is that sport science and biology students have the same normative range value. Result showed that there is significance difference between them in statistical test however there no difference in international norm range.

Table 22 Ruler Drop norm (reaction time both male and female)

Age 18-25

Excellent	above average	Average	below average	Poor
<7.5cm	7.5-15.9cm	15.9-20.4cm	20.4-28cm	>28cm

(Aranha *et al*., 2017).

As compared with the international norms the results of female sport science students were scored below average while biology students were scored below average the same as sport science.

Table 23 Comparative Analysis of Reaction Time between Sport Science and biology 3rd year Male Students

Group	Sample	Mean	S.D
Sport science male	16	13.75	±*4.73*
Biology male	16	17.54	±*7.16*

The analysis of table 25 shows that the mean and standard deviation value on the reaction time variable of the sport science male students and biology male students were recorded as13.75, ± *4.73* and17.54, ±*7.16 respectively*. It showed that the sport science male participants have performed above average as compared to biology students in reaction time variable. From table 25 it has been observed that the mean score of sport science male students is above average while biology students have average. The mean score of reaction time test sport science above average and biology students have average as compared to international norms. So the conclusion is that sport science better than biology students. As result showed that there is no significance difference between the both departments according to statistical test.

Table 24 Ruler Drop test norm (reaction time both male and female)

Age 18-25

Excellent	**above average**	**Average**	below average	Poor
<7.5cm	7.5-15.9cm	15.9-20.4cm	20.4-28cm	>28cm

As compared with the international norms the results of male sport science students were scored well while biology students were scored average.

Table 25 Comparative Analysis of Speed between Sport Science and Biology Female Students

Group	Sample	Mean	S.D
Sport science female	16	4.7	±*0.19*
Biology female	16	4.9	±*0.49*

The analysis of table 27 shows that the mean and standard deviation value on the speed variable of the sport science female students and biology students in 30m dash test were recorded as 4.7, ±*0.19 and* 4.9,±*0.49* respectively. It showed that the sport science female students performed average and biology female have performed below average as compared to sport science students in speed variable so significance difference as to international norm data. As conclusion that sport science students have the average speed and biology students

below average. There is no significance difference between both department female students in 30 meter dash test when it compared with statistical test

Table 26 30meter Sprint norm for female (speed)

Age 18-25

	Female
Excellent	<4.5
Average	4.8-4.7 average
Below average	5-4.9 below average
Poor	>5

(Mosavi *et al.*, 2016).

As compared with the international norms the results of female sport science students were scored average while biology female students were scored below average.

Table 27 Comparative Analysis of Speed between Sport Science and Biology Male Students

Group	Sample	Mean	S.D
Sport science male	16	4	*±0.09*
Biology male	16	4.3	*±0.20*

The analysis of table 29 showed that the mean and standard deviation value on the speed variable of the sport science male students and biology students in 30m dash test were recorded as 4, *±0.09 and* 4.3, *±0.20* respectively. It showed that the sport science male students performed excellent and biology male have performed average as compared to sport science participants in speed variable so there is significance difference. As conclusion that sport science students have the excellent speed and biology students' average. So sport science students are statistically highly significant than biology students.

Table 28 30meter Sprint (speed)

Age 18-25

	Male
Excellent	<4 excellent
Average	<4.4 -43 average
Below average	4.6-4.5
Poor	>4.6

As compared with the international norms the results of male sport science students were scored excellent while biology male students were scored average.

5. SUMMRY, CONCLUSION AND RECOMMENDATION

5.1. Summary

The purpose of the study was to comparison skill related physical fitness components between Sport science and Biology department students of Wachemo University. The data collected from the study was analyzed using SPSS version 20 software. The differences between the pre test to deference between sport science and biology students scores in skill related Variables were subjected by using analyzing mean and standard division to find out whether the mean value were significant or not. Generally, when the major finding of the study is summarized, there is variation between sport science department and biology department students in their physical performance. The study was included male and female students from sport science and biology departments of WU College of natural and computational sciences. The total number of the students 128 from these total students selected 64 male and female equally. In general, when the major finding of the study is summarized, there is variation between sport science department and biology department students in their physical performance. For instance, there is a great disparity between sport science department and biology department students with regard to the sport activities. Furthermore, these sport science department had practical programs depending on their course indicated in performing physical exercise, whereas the biology department students no involve programs in physical exercise completely because there are no sport like course.

5.2. Conclusion

Based on the major findings of the study, comparison of physical fitness components of Wachemo University sport science and biology department students as compared with the international norms the following points are stated as conclusion.

- Both Male and female sport science students are fulfilled the international norms in most physical fitness tests except balance and power.
- Biology department students were not fulfilled the international norms in most physical fitness tests except stroke balance and power for male and reaction time for female.
- The results of the compared data from the concerned participants indicate that; based on comparisons with normative data, the current physical fitness level of male and female students were mostly at equal value at balance and power for male and reaction time for female. The participants were the same value on these tests when comparing with the values obtained with the reference values provided by the normative data.
- However, the overall skill related physical fitness component variables level of Wachemo University Biology female students is not in a good in agility, coordination and speed the same biology male.
- It was concluded that all the skill related physical components tests adopted for the study were capable of enhancing the student's performance.
- In conclusion the results of the present study confirm the fact that sport science students were comparatively better than biology students' in performance qualities except stroke balance and power test for male and reaction time test for female.
- These three tests are equal compare with normative range value but reaction time female have difference statically, so most of the time sport science students have regular course exercise in their fields by help of sport science teachers.

5.3. Recommendation

The following points are recommendation to excellent solution for comparative analysis between sport science students' and biology students. The Wachemo University should work with trained for other department gave as introduction like physical fitness course.

- The present study was delimited only to sport science and biology male and female students. The same type of study should make with biology department students. By considering the major findings and conclusions of the study, it is important to state the following points as a recommendation to investigate more on skill related physical fitness components of sport science students and other fields.

- Future research should needs to examine methods for increasing skill related physical fitness levels among this population group, identify such factors influenced physical fitness levels of the students and solve the problems which are faced by participants with skill related physical fitness components.
- Further research on the benefits of physical fitness for sport science students and other students for their daily routine.

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7 APPENDEXES

Appendix–A

Table 29- List of Subject Participants of the Study

No	Subject's name	Sport science department Female				
		Age	Height	Weight	Grade Level	Address
1	Subject 1	22	1.48	49	3rd year	Wachemo University
2	Subject 2	20	1.49	50	3rd year	Wachemo University
3	Subject 3	21	1.50	48	3rd year	Wachemo University
4	Subject 4	21	1.52	51	3rd year	Wachemo University
5	Subject 5	23	1.48	49	3rd year	Wachemo University
6	Subject 6	23	1.49	52	3rd year	Wachemo University
7	Subject 7	20	1.50	47	3rd year	Wachemo University
8	Subject 8	21	1.51	48	3rd year	Wachemo University
9	Subject 9	24	1.61	51	3rd year	Wachemo University
10	Subject 10	23	1.60	53	3rd year	Wachemo University
11	Subject 11	21	1.62	54	3rd year	Wachemo University
12	Subject 12	20	1.50	50	3rd year	Wachemo University
13	Subject 13	24	1.60	58	3rd year	Wachemo University
14	Subject 14	21	1.50	52	3rd year	Wachemo University
15	Subject 15	19	1.49	49	3rd year	Wachemo University
16	Subject 16	22	1.55	54	3rd year	Wachemo University

List of Subject Participants of the Study

No	Subject's name	Biology Department Female				
		Age	Height	Weight	Grade Level	Address
1	Subject 1	23	1.55	52	3rd year	Wachemo University
2	Subject 2	22	1.55	53	3rd year	Wachemo University
3	Subject 3	21	1.49	55	3rd year	Wachemo University
4	Subject 4	24	1.61	60	3rd year	Wachemo University
5	Subject 5	23	1.49	56	3rd year	Wachemo University
6	Subject 6	20	1.58	49	3rd year	Wachemo University
7	Subject 7	22	1.50	50	3rd year	Wachemo University
8	Subject 8	24	1.58	59	3rd year	Wachemo University
9	Subject 9	23	1.56	57	3rd year	Wachemo University
10	Subject 10	21	1.58	53	3rd year	Wachemo University
11	Subject 11	22	1.49	49	3rd year	Wachemo University
12	Subject 12	20	1.55	46	3rd year	Wachemo University
13	Subject 13	19	1.49	45	3rd year	Wachemo University
14	Subject 14	24	1.64	61	3rd year	Wachemo University
15	Subject 15	23	1.63	54	3rd year	Wachemo University
16	Subject 16	22	1.49	50	3rd year	Wachemo University

List of Subject Participants of the Study

No	Subject's name	Sport science department male				
		Age	Height	Weight	Grade Level	Address
1	Subject 1	21	1.57	54	3rd year	Wachemo University
2	Subject 2	22	1.65	58	3rd year	Wachemo University
3	Subject 3	23	1.54	56	3rd year	Wachemo University
4	Subject 4	24	1.66	60	3rd year	Wachemo University
5	Subject 5	23	1.56	57	3rd year	Wachemo University
6	Subject 6	20	1.55	58	3rd year	Wachemo University
7	Subject 7	22	1.59	59	3rd year	Wachemo University
8	Subject 8	21	1.58	55	3rd year	Wachemo University
9	Subject 9	23	1.50	54	3rd year	Wachemo University
10	Subject 10	24	1.60	61	3rd year	Wachemo University
11	Subject 11	22	1.72	68	3rd year	Wachemo University
12	Subject 12	23	1.67	64	3rd year	Wachemo University
13	Subject 13	19	1.65	58	3rd year	Wachemo University
14	Subject 14	24	1.58	59	3rd year	Wachemo University
15	Subject 15	24	1.67	50	3rd year	Wachemo University
16	Subject 16	24	1.60	55	3rd year	Wachemo University

List of Subject Participants of the Study

No	Subject's name	Biology Department Male				
		Age	Height	Weight	Grade Level	Address
1	Subject 1	22	1.66	59	3rd year	Wachemo University
2	Subject 2	24	1.59	61	3rd year	Wachemo University
3	Subject 3	23	1.58	63	3rd year	Wachemo University
4	Subject 4	24	1.62	64	3rd year	Wachemo University
5	Subject 5	21	1.61	65	3rd year	Wachemo University
6	Subject 6	23	1.65	59	3rd year	Wachemo University
7	Subject 7	23	1.64	61	3rd year	Wachemo University
8	Subject 8	22	1.67	62	3rd year	Wachemo University
9	Subject 9	22	1.58	55	3rd year	Wachemo University
10	Subject 10	24	1.63	57	3rd year	Wachemo University
11	Subject 11	21	1.54	58	3rd year	Wachemo University
12	Subject 12	24	1.56	63	3rd year	Wachemo University
13	Subject 13	21	1.67	64	3rd year	Wachemo University
14	Subject 14	23	1.60	57	3rd year	Wachemo University
15	Subject 15	24	1.66	67	3rd year	Wachemo University
16	Subject 16	21	1.60	65	3rd year	Wachemo University

APPENDIX –B

Table 30Test of Record Sheet

Physical Fitness Parameter Test Recording Sheet for sport science 3rd year female students (16)

No	Subject's Code	PT						Remark
		Agility	Balance	Coordination	Power	Reaction time	Speed	
1	Subject 1	17	45	30	12	18	4.8	
2	Subject 2	17.5	26	20	9	19	4.5	
3	Subject 3	17.3	29	18	8	20.4	4.7	
4	Subject 4	17.1	28	19	7	26	4.8	
5	Subject 5	18.9	27	17	6	27	4.8	
6	Subject 6	18.4	29	18	5	16	4.7	
7	Subject 7	21.9	25	15	16	20.6	4.7	
8	Subject 8	21.8	28	16	7	15	4.8	
9	Subject 9	22	29	17	9	16.2	5	
10	Subject 10	23	25	19	10	14	4.9	
11	Subject 11	21.8	25	18	18	14.5	4.8	
12	Subject 12	22.5	27	20	20	20	4.8	
13	Subject 13	22.5	25	20	21	26	4.7	
14	Subject 14	22.9	41	13	11	26	4.6	
15	Subject 15	22.4	29	12	5	27	4.2	
16	Subject 16	21.7	26	11	10	27.5	4.4	

Caption: Agility- 1 Balance-2 Coordination-3 Power-4 Reaction time-5 Speed-6

Physical Fitness Parameter Test Recording Sheet for Biology 3rd year female students (16)

No	Subject's Code	PT						Remark
		Agility	Balance	Coordination	Power	Reaction time	Speed	
1	Subject 1	23	25	18	6	27	4.6	
2	Subject 2	24	50	15	10	19.8	4.8	
3	Subject 3	23	46	12	9	26.5	5.5	
4	Subject 4	23.5	23	14	7	23.6	6	
5	Subject 5	23.6	24	11	5	25	5	
6	Subject 6	23.4	18	15	12	18.9	4.9	
7	Subject 7	23.8	21	13	4	28	5	
8	Subject 8	22.9	20	12	5	15.9	3.5	
9	Subject 9	23.5	22	14	4	24	5	
10	Subject 10	24	26	13	9	20.4	4.9	
11	Subject 11	24	19	14	11	24.5	4.9	
12	Subject 12	22.5	17	15	6	26	4.9	
13	Subject 13	24	21	19	5	27	5	
14	Subject 14	22.9	23	15	7	26	5	
15	Subject 15	24	12	14	5	27	4.9	
16	Subject 16	22.9	11	15	18	27.5	4.9	

Caption: Agility- 1 Balance-2 Coordination-3 Power-4 Reaction time-5 Speed-6

Table 10-Physical Fitness Parameter Test Recording Sheet for sport science 3rd year male students (16)

No	Subject's code	PT						Remark
		Agility	Balance	Coordination	Power	Reaction time	Speed	
1	Subject 1	15.5	50	35	17	7.5	4	
2	Subject 2	15.8	50	33	19	8	4	
3	Subject 3	14	49	34	18	10	4	
4	Subject 4	15.5	48	35	20	9	4	
5	Subject 5	15	45	34	16	11	4	
6	Subject 6	16.9	46	31	19	12	4	
7	Subject 7	17.2	44	35	20	14	4	
8	Subject 8	16	39	32	24	15	3.9	
9	Subject 9	18.1	38	33	18	14.3	4.1	
10	Subject 10	16.5	35	30	22	13.8	4.2	
11	Subject 11	16.4	33	36	23	14.9	3.8	
12	Subject 12	14.5	37	32	15	13.5	4.1	
13	Subject 13	16.3	39	31	21	15	4	
14	Subject 14	15.5	41	35	18	25	4.1	
15	Subject 15	15.9	42	35	22.2	14	4	
16	Subject 16	16	49	37	12	23	3.9	

Caption: Agility- 1 Balance-2 Coordination-3 Power-4 Reaction time-5 Speed-6

Physical Fitness Parameter Test Recording Sheet for biology 3rd year male students (16)

No	Subject's code	PT						Remark
		Agility	Balance	Coordination	Power	Reaction time	Speed	
1	Subject 1	15.8	50	30	15	14	3.9	
2	Subject 2	17	46	31	16	13	4.3	
3	Subject 3	18	48	29	18	12	4	
4	Subject 4	18.4	49	28	19	8	4.5	
5	Subject 5	18.5	44	27	17	7	4.3	
6	Subject 6	18.3	43	29	13	9	4.5	
7	Subject 7	19.2	44	26	12	15.8	4.3	
8	Subject 8	18.8	30	30	20	15.7	4.5	
9	Subject 9	19.2	41	23	16	20	4.4	
10	Subject 10	19	42	24	19	20.2	4.1	
11	Subject 11	18.5	45	33	17	20.1	4.6	
12	Subject 12	18.9	38	24	21	27	4.3	
13	Subject 13	19.2	37	20	15	28	4.5	
14	Subject 14	15.5	35	19	17	26	4.4	
15	Subject 15	19.9	23	30	20	29	4.1	
16	Subject 16	20	38	27	22	15.9	4.2	

Caption: Agility- 1 Balance-2 Coordination-3 Power-4 Reaction time-5 Speed-6

APPENDIX-C

Table: 31 Standard Reference for Skill Related Physical Fitness Tests

Standard Reference of skill related physical fitness components (Illinois agility test) age for 18-25 year

Rating	Males (seconds)	Females (seconds)
Excellent	< 15.2	< 17.0
Above average	15.2 - 16.1	17.0 - 17.9
Average	16.2 - 18.1	18.0 - 21.7
Below average	18.2 - 19.3	21.8 - 23.0
Poor	> 19.3	> 23.0

Standard Reference (balance both male and female) age for 18-25 years

Rating	Score (seconds)
Excellent	> 50
Good	40 – 50
Average	25- 39
Fair	10 – 24

Eye hand coordination norm (coordination both male and female) age for 18-25 years

Rating	Score (in 30 seconds)
Excellent	> 35
Good	30 – 35
Average	20- 29
Fair	15 – 19
Poor	< 15

Vertical jump norm (power) age for 18-25 years

	Males		Females	
Rating	(inches)	(cm)	(inches)	(cm)
Excellent	> 28	> 70	> 24	> 60
very good	24 – 28	61-70	20 – 24	51-60
above average	20 – 24	51-60	16 – 20	41-50
Average	16 – 20	41-50	12 – 16	31-40
below average	12 – 16	31-40	8 – 12	21-30
Poor	8 – 12	21-30	4 – 8	11-20
very poor	< 8	< 21	< 4	< 11

Ruler drop (reaction time both male and female) age for 18-25 years

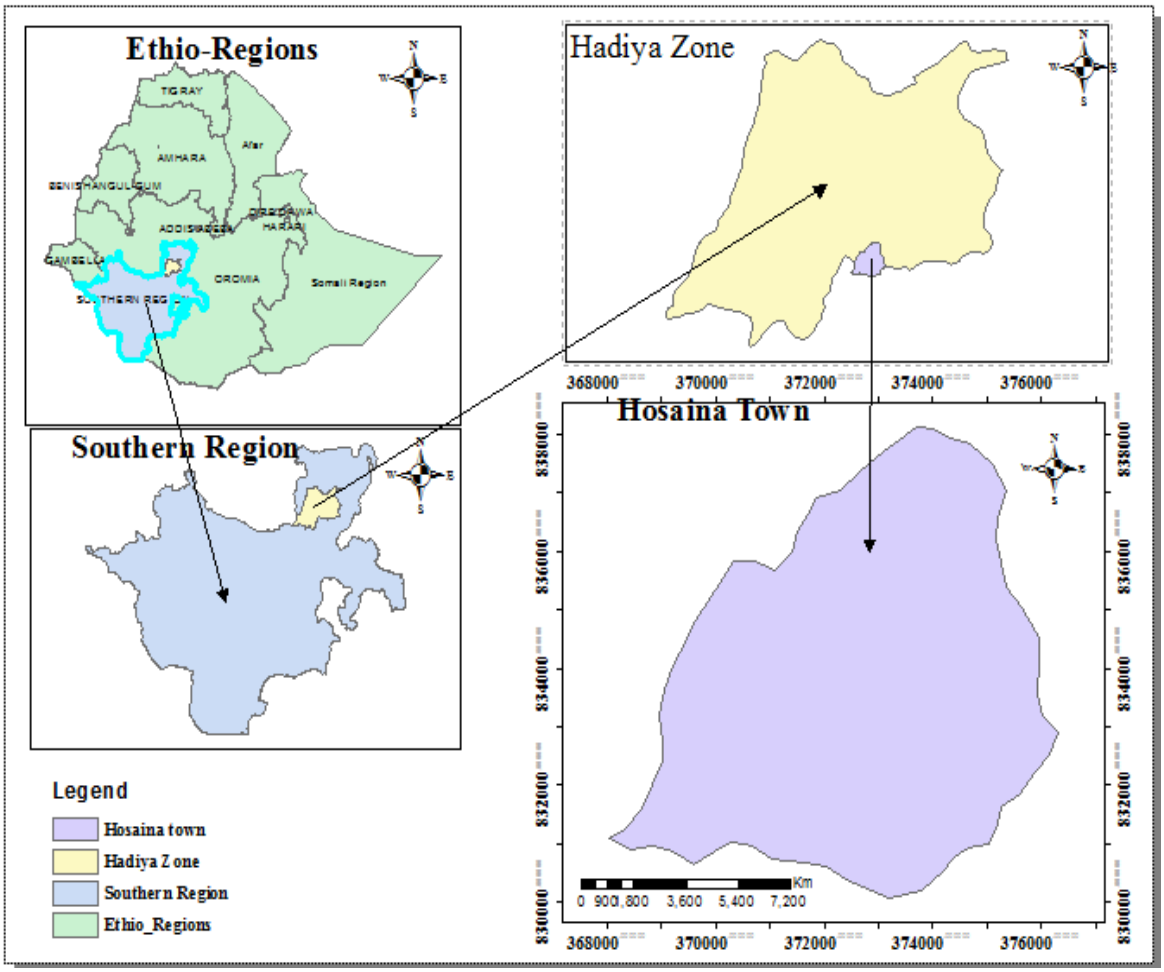
Excellent	above average	Average	below average	Poor
<7.5cm	7.5-15.9cm	15.9-20.4cm	20.4-28cm	>28cm

30meter sprint norm (speed) age for 18-25 years

	Male	Female
Excellent	<4	<4.5
Average	<4.4 -43	4.8-4.7
Below average	4.6-4.5	5-4.9
Poor	>4.6	>5

APPENDIX -D

Figure 1Map of the Study Site



Source; Ethio GIs Haramaya University (2018)