

**Jimma University  
College of Natural Science  
Department of Sport Science**



**Comparative study of selected physical and psychological variables; Specific reference to  
Oromia Athletics clubs middle distance runners**

**By: Tizita Getahun Beyene**

**The research submitted to the department of sport Science College of natural science of  
Jimma university partial fulfillment of the requirement for the degree of master in  
coaching athletics.**

**August, 2020**

**Jimma, Ethiopia**



**Jimma University**

**School of Graduate Studies**

**Department of Sport Science**

**Comparative study of selected physical and psychological variables: Specific reference to Oromia Athletics clubs middle distance runners**

**By: Tizita Getahun Beyene**

**Advisor: Tesfaye Damena (Ass. Prof)**

**A Thesis Submitted to School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Athletics Coaching.**

**August, 2020**

**Jimma, Ethiopia**



### **Declaration**

I Tizita Getahun hereby declare that this Thesis is my original work and that it has not been submitted partially; or in full, by any other person for an award of a degree in any other university or institution.

Name \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

This thesis has been submitted to School of Graduate Studies with my approval as an Advisor:

Name of Advisor \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_



## **Approval Sheet**

The undersigned certify that we have read and hereby recommends to the Jima University to accept the thesis submitted by Tizita Getahun and entitled ‘comparative study of selected physical and psychological variables in Adama, oromia road authority and Gelan athletics clubs’ in Partial Fulfillment of the Requirements for the Degree of Master of Science in Athletics Coaching.

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## **Abbreviations and acronyms**

AAHPERD American Association of Health, physical Education and Recreation

EAF Ethiopian Athletics Federation

IAAF International Association of Athletics Federation

ORA Oromiya Road Authority

NAAAA National Association of Amateur Athletes of America

## ***Abstract***

*The general objective of the study was to compare some selected physical and psychological measurement with Oromia athletics club middle distance runners. The study design was experimental research design which enables to study the comparison of the study of selected physical and psychological measurement. 52 athletes' (21 female and 31male) from the total of 123 athletes in Adama, Gelan and oromia road authority were selected through random sampling technique. Data was gathered through physical fitness assessors by agility, shuttle run, zig zag, cooper test and task and ego orientation. In order to analyze quantitative data, descriptive statistics such as mean standard deviation, percentage and frequency counts used. In addition to this, inferential statistics such as t test, ANOVA was used to identify differences among group. Regression was performed between the tests of psychological and physical fitness. Measuring the three physical fitness variables namely, agility, speed and endurance were measured in second and meter. The average agility accomplishment was found in 16.7 and the difference between the groups was .73 microseconds. Speed of athletes was measured in 60 meter dash, the average athletes were found in 8.4 second and with the variation of .52 distances. Endurance of the athletes was found in three different categories, the average distance covered by athletes were 3448.08 and with the variation of 290.7 meter. There was a large positive correlation between speed and task with large association of the athlete achievement. There was a large positive correlation between speed and ego with large association of the athlete achievement. Training programmes should be designed to develop more speed, agility, and endurance for ego and task orientation. Further research in the area shall be conducted on other specific fitness components through increasing subjects and adding athletes of other teams.*

**Key words:** (Physical fitness, agility, speed, endurance, ego, and task orientation)





# Chapter one

## 1. Introduction

This chapter deals with about the background of the study, statement of the problem, research questions, general and specific objectives of the study, significance of the study, delimitation of the study, limitation of the study, operational definition, and organization of the study.

### 1.1 Background of the study

Physical fitness is one of the most important aspects in the field of physical education. But physical fitness is not the same with health; it plays an essential role in all aspects of health because they are very much related. Good health provides a solid foundation on which fitness rests and at the same time fitness provides one of the important keys to health and living one's Life to the fullest. Fitness is not a state for the young; it is reality for all ages. Fitness is a product of exercise and training has been shown through research to posse's important implication in the general health of people. Proper nutrition, adequate rest relaxation, health appraisal and good habits are all factors of implementation. The physical fitness is a concept which has both an absolute and a relative meaning. In absolute term the man can run faster, jump heist, lift and handle the heaviest burdens and attain the highest output during a working day, must be most fit the person for the particular activity (Thomas, Murphy, & Hardy, 1999).

Physical fitness and a healthy mind is an inevitable aspect of human life. Swami Vivekananda strongly stressed the importance of physical fitness when he said, "Be strong my young friends, that is my advice to you. You will be nearer to heaven through football than through the Gita". The performance in most of the sports is determined by such factors as physical fitness, techniques and tactics, their relative contribution varies from sport to sport. In addition to these, other factors like physique, body composition and psychological traits and physiological characteristics also have an overall effect on the performance. It has been recognized by experts and sports scientists that high level performance in athletics not only requires certain physical attributes like speed, cardiovascular endurance, explosive strength, agility, flexibility, strength etc., but also physiological features help him for his high performance. The ability of an individual to perform well in given physical activity depends on certain variables the most important of which is the magnitude of one's energy supplied and the type of energy needed.

Understanding the psychological factors that accompany successful athletic performance is a high priority for applied sport psychology, with a major area of focus being mental links to optimal performance. To advance knowledge in this area, it is important to examine specific psychological constructs with theoretical relevance to optimal performance in order to understand what psychological processes might be contributing to quality of performance. The second area examined for potential relevance to understanding athletes' flow experiences was their strategic use of psychological skills. The skills involved in regulating arousal, processing information, and managing emotions are particularly important for competitive athletes (Thomas, Murphy, & Hardy, 1999). These skills are commonly targeted in training programs and have been found to differentiate successful and unsuccessful athletes (Mahoney, Gabriel, & Perkins, 1987; Thomas & Over, 1994). Flow is not an easy state to attain, and getting in to flow involves a certain level of psychological skills, such as ability to control attention (Csikszentmihalyi, 1990). The importance of psychological skills to athletic performance is well documented in the sport psychology literature (e.g., Hardy, Jones, & Gould, 1996; Williams & Krane, 1998). Recently, Thomas et al. (1999) have developed a self-report instrument to measure athletes' psychological skills and performance strategies. Eight areas are assessed including self-talk, emotional control, automaticity, goal-setting, imagery, activation, negative thinking, and relaxation. In general, it was expected that the more proficient athletes are at using psychological skills in their sport, the more likely they will experience flow due to developing greater control over their thoughts and emotions during performance. More specifically, the psychological factors predicted to be most related to flow experience were automaticity, the absence of negative thinking, goal-setting, emotional control, and relaxation. These skills were considered to be most conceptually relevant to the dimensions of flow from the eight psychological skill areas assessed by the Thomas et al. (1999) instrument.

According to Ames (1992) goal orientation and urge define the selection of task, the level of effort, persistence, the perception of ability and the definition of success and failure. Other studies by Kleiber & Roberts, (1981) and Orlick (1981), by using competitive and non competitive conditions concluded that the behavior of an athlete depends on his/her orientation. Nicholls (1984,1989) stated that ego oriented individuals perceive ability and success from a canonical perspective while task oriented individuals deal mostly with learning and is possible to adopt more inherent motive schemes such is the development of ability and enjoyment (Papaioannou & Theodorakis, 1994). According to Diggelidis & Krommydas (2008), task and ego are orientations

representing opposite views on ability and the definition of success. Task oriented athletes present a pro social behavior and judgment in contrary to ego oriented athletes. These individuals perceive success differently, make less effort to approach it and are affected by outside rewards. The more ego oriented an individual is the most will try to outmatch his/her friends and the most will believe that this effort to outmatch others may lead to success. On the contrary the more task oriented an individual is the most he/she believes that success depends on effort, interest and pursue of new abilities (Treasure & Roberts, 1995). Most of these studies showed that task orientation is significantly related to positive moral behaviours, while ego orientation appears to be significantly related to unsportsmanlike behaviours (Dunn & Dunn, 1999; Proios, Athanailidis, 2004). In contrast to these findings, there are other studies that claim that task orientation is not significantly related to moral behaviours (Kavussanou, 1997; Stephens & Bredemeier, 1996). Therefore; the study would be to compare some selected physical and psychological variables in Adama, Gelan and oromia road authority athletics club.

## **1.2 Statement of the problem**

Athletics is a group of sporting events that involves competitive running, jumping, throwing, and walking. The most common types of athletics competitions are track and field, road running, cross country running, and race walking. ... Organized athletics are traced back to the Ancient Olympic Games from 776 BC. The sport of track and field has its roots in human prehistory. Track and field-style events are among the oldest of all sporting competitions, as running, jumping and throwing are natural and universal forms of human physical expression. Athletics is the largest single sport at the games, with the programme divided into track, field and road events. Currently, athletics is one of the most popular games that are practiced in all nation of the world. In the competition it is simple no need of expensive equipment makes athletics popular all over the world. Athletics is a dynamic sport that needs understanding the quality of training and solving problems of competent performance in a frequent changing world. Although the exact roots of Ethiopian Athletics cannot be retraced back accurately, it is widely believed that the sport was widely practiced in schools and military camps before 1897. The sport was limited to these parts of society only because others did not have access to equipment used for competitions or was not organized in a manner that motivated progress. But after signs that the sport was increasing in popularity in many parts of society, a need to assemble these activities under one organizing umbrella quickly arose. It was in 1961 that the Ethiopian Athletics Federation (EAF) was shaped and soon became a member of the International Associations of Athletics Federation (IAAF)

Since its inception, much of the federation's activities were carried with the help of amateurs. The Ethiopian Athletics Federation has been established since June 4, 1961 (Yekatite 27/53). Through the past 56 years the federation had many great achievements in the athletics sport fields. So, the federation can be nominated as one of the best performing member countries of the International Association of Athletics Federation /IAAF/. Globally, the Ethiopian Athletics Federation is one of the leading member federations of IAAF especially in long and middle distances. in Continent level, in recent times the Ethiopian athletes are appearing in short distances and field events with medals. In the past some years, the Ethiopian Athletics Federation was giving more and more attention to the short distances and field events of athletics sports, by recruiting and hiring an international coach from US. In doing so the federation got fruits from short distance and field events in continent level. And the vision of EAF, as a national federation, is to be active participant and successful competent in Africa and the world.

In order to enhance and develop the succeeding athletes of the future, the national federation of athletics of Ethiopia has exceedingly built and plant athletics sport training centers in different regions of the country. This is the greatest achievement in our history of athletics sports ever. As the whole world knows, Abebe Bikila (Bare foot runner and winner), Mamo Woldie, Miruts Yifter (Gear changer), Haile Gebresilassie, Derartu Tullu, Getie Wami, Kenenisa Bekele, Tirunesh Dibaba, Meseret Defar, and many other internationally known athletes are the fruits of Ethiopia given to the world. Ethiopia, as it is clearly known by the whole member countries of African athletics sports association, is participating in a very active manner and change oriented mentality in EAAR being as a president for about 3 times, council and technical member to CAA to enhance and contribute its share to the rest of Africa. These showed that Ethiopia is giving her highly great potential, experiences and capabilities to others by participating in all activities of the athletics sports ([www.ethiopianathletics.com](http://www.ethiopianathletics.com))

There are many Athletics clubs in Ethiopia. And also there are a lot of Athletics clubs in Oromiya Region. Although Ethiopia is well known, its current world position in athletics is 'inconsistent'. Because of such criterions the researcher had selected Adama athletics club, Gelan Athletics and Oromiya Road Athletics club. Adama athletics club has established by 2010 E.C to give training for Oromiya youths in general and Adama in particular. From the inauguration onwards the club registered up to 46 cups, with in this seven years of training the club escalated dramatically. The achievement of the Adama Athletics club level it on top other Oromiya athletics club. To bring

some of the achievement at Oromia Region, the club has recruited 65 athletes among this 35 and 30; female and male athletes respectively. In contrast to this Gelan Athletics has been established by 2015, from the onset of the training in the compound there female 17 and male 19; totally it is 36. The club athletes has competed in club competition and won half marathon title and Oromia road authority was establish by 2010 as the same time of Adama 12 and 38 female and male more success at long distance running. Having this performance but not yet the club assessed the performance of physical fitness and psychological test. Both clubs have not a program to track the progress of their athletes' performance.

Testing the physical and physiological abilities of athlete is important for a variety of reasons including: identifying the strengths and limitations of athlete, monitoring athletes during critical windows of development. Fitness testing is used as a way of comparing an athlete's results to previous performances or to normative standards established in the sport. Fitness testing can thus be used to modify future training as appropriate. (Ashok, 2008).

AAPHERD, (1980), stated that physical fitness is an expression of physical development in a number of discrete areas that can be classified into two major categories. Namely, health related physical fitness and the performance related physical fitness, each with its own specific components as listed below.

1. Health related physical fitness; Cardiorespiratory endurance, Muscular strength, Body composition and Flexibility.
2. Performance related physical fitness; Balance, Agility, Power, Speed, Reaction time and Coordination.

Physical fitness is an individual quality that varies from person to person. It is influenced by age, sex, heredity, personal habits, exercise and eating habit practice. Physical fitness is all encompassing; it is a state characterized the degree to which the individual is able to live most and to serve best. The ability to function emotionally, socially and spiritual components of fitness, all of which are related to each other and mutually interdependent (AAPHERD, 1989). Due to ease of the tests for participants, time and budget constraint the researcher had selected the speed, agility and endurance physical fitness tests.

### **1.3 Research questions**

The research questions of this research were:

1. What are the athletes' performance of agility, endurance and speed in Oromia athletics club middle distance runners?
2. What are the task and ego orientation of psychological performance in Oromia athletics club middle distance runners?
3. Do the performance of agility, endurance and speed related to the task and ego orientation of psychological performance in Oromia athletics club middle distance runners?

## **1.4 objectives of the study**

### **1.4.1 General objective**

The general objective of the study was to compare some selected physical and psychological measurement with Oromia athletics club middle distance runners.

### **1.4.2 Specific objectives**

The specific objectives of the study were to:

- Describe the athletes' agility, speed, and endurance of Oromia athletics club middle distance runners?
- Identify the task and ego of athletes in Oromia athletics club middle distance runners?
- Correlate the physical fitness and psychological fitness with Oromia athletics club middle distance runners?

## **1.5 Significance of the Study**

It is obvious that, the quality of competition which is realized through effective teaching and learning determines the quality of training by the coaches. Assessing the study was compare some selected physical and psychological measurement with Adama, Gelan and oromia road authority athletics club. Accordingly, the researcher believes that, this study would have the following significances.

- It may help the coaches to undertake self-assessment regarding their usual coaching process.
- It may show the level of fitness of the coaching pedagogy during athletics club training in those clubs.
- It may give an opportunity for ministry of sport in policy maker to be aware of the problems and help them to design strategies for implementing the suggested recommended points while developing the training curriculum of the subject.

- It may initiate other researchers to conduct similar study at a wider scale and serves as a stepping stone for further research in the field.

### **1.6 Delimitation of the Study**

The researcher believed that, it could be better to conduct the study in large scale. However, due to time constraint, the researcher was delimited to compare some selected physical and psychological measurement of Adama, Gelan and Oromia road authority middle distance athletics runners. Even though, in Oromia region there are different athletics club, because of geographical proximity and success/failure of the clubs, this study was delimited to Adama, Gelan and Oromia road authority athletics club. In order to make the study more clear, specific, accurate and manageable, this study was delimited on endurance, speed and agility of fitness components.

### **1.7. Limitation of the Study**

Any research cannot be free from limitations but the degrees of challenge vary depending on the nature and type of research problem and study site. Temporary shortage of references and internet access were occurred as limitations.

### **1.8 Definition of terms**

The following terms are operationally defined for the purpose of this investigation:

**Agility:** refers to a “rapid whole body movement with change of velocity or direction in response to a stimulus” Sheppard and Young (2005).

**Endurance:** refers to the ability to sustain the necessary activity level for a specific competitive sport/ your body’s physical capability to sustain an exercise for an extended period ([www.sportstraining.com](http://www.sportstraining.com))

**Speed:** refers to a person’s ability to move fast ([www.topenedsport.com](http://www.topenedsport.com))

### **1.9 Organization of the Study**

This study is organized under five chapters. The first chapter highlights the paper; and why to study. Chapter two reviews related literature to distinguish previously discovered areas to cover the ground for what is to be obtained in this study. Chapter three deals how to make the research, the targets to shot upon, and how the data to be analysed. Chapter four analyses data of different sources and nature to achieve the objective of the study. The final chapter is to summarize, conclude, and forward suggestion and recommendations based on what is obtained in chapter four.

## Chapter two

### 2. Review of related literature

#### 2.1 Origin and early development of Athletics

Athletics is often used synonymously with any sporting activity, but in most cases, athletics refers primarily to track-and-field events that involve running, jumping or throwing. Those athletic events are most closely associated with the Olympics, but competition in these sports is held at the youth level, high school, college, and professional ranks all year round throughout the world. There is little in the way of definitive records of athletics' early days as organized sport. Egyptian and Asian civilizations are known to have encouraged athletics many centuries before the Christian era. Perhaps as early as 1829 BC, Ireland was the scene of the Lugnasad festival's Tailteann Games, involving various forms of track-and-field activity. The Olympic Games of Greece, traditionally dated from 776 BC, continued through 11 centuries before ending about AD 393. These ancient Olympics were strictly male affairs, as to both participants and spectators. Greek women were reputed to have formed their own Heraea Games, which, like the Olympics, were held every four years ([www.athletics history.com](http://www.athletics-history.com))

The first Olympics in ancient Greece go back at least as far as the eighth or ninth century B.C. While such sports as boxing and equestrian events were included, most of the events were those now classified under athletics or track and field. They included running, jumping, discus and the javelin. Those four, plus wrestling, made up the pentathlon. The running events included "stades," which were essentially sprints from one end of the stadium to the other, a distances of about 190 meters; two-stade races; longer-distance races of between seven and 24 stades; and a two- or four-stade race in which the competitors wore armor. Running and other athletic events have long been a part of many cultures, but in the 19th century, such activities were becoming more popular, particularly in Europe and the United States.

School curricula included athletics and in 1896, the first Modern Olympics were held in Athens, Greece. Events included the 100-meters, 400 meters, 800 meters, 1,500 meters, 110-meter hurdles, pole vault, discus, shot put, javelin, long jump, triple jump and high jump. Fourteen nations were represented. Athletics as practiced today was born and grew to maturity in England. The first mention of the sport in England was recorded in 1154, when practice fields were first established in London. The sport was banned by King Edward III in the 1300s but revived a



century later by Henry VIII, reputed to be an accomplished hammer thrower. The development of the modern sport, however, has come only since the early 19th century. Organized amateur footraces were held in England as early as 1825, but it was from 1860 that athletics enjoyed its biggest surge to that date. In 1861 the West London Rowing Club organized the first meet open to all amateurs, and in 1866 the Amateur Athletic Club (AAC) was founded and conducted the first English championships. The emphasis in all these meets was on competition for “gentlemen amateurs” who received no financial compensation. In 1880 the AAC yielded governing power to the Amateur Athletic Association (AAA). The first meet in North America was held near Toronto in 1839, but it was the New York Athletic Club, formed in the 1860s, that placed the sport on a solid footing in the United States.

The club held the world’s first indoor meet and helped promote the formation in 1879 of the National Association of Amateur Athletes of America (NAAAA) to conduct national championships. Nine years later the Amateur Athletic Union (AAU) took over as national governing body, amid reports that the NAAAA was lax in enforcing amateurism (Mock, 2003)

Athletics was well established in many countries by the late 1800s, but not until the revival of the Olympic Games in 1896 did the sport become truly international. Although begun modestly, the Olympics provided the inspiration and standardizing influence that was to spread interest in athletics worldwide. In 1912 the International Amateur Athletic Federation (IAAF) was founded, and by the time that organization celebrated its 75th anniversary in 1987 it had more than 170 national members. Its rules applied only to men’s competition until 1936, when the IAAF also became the governing body of women’s athletics. Major international competitions before World War II included the Olympics, the British Empire Games, and the European Championships, but after the war athletics experienced its greatest period of growth, taking root especially in the developing countries. By the 1950s world-class athletes from African, Asian, and Latin American nations were enjoying great success at international meets.

After the 1896 Olympics, the popularity of athletics, or rather, a revival of athletic competition, took place around the world. National athletics federations from 17 countries got together to form an international governing body and in 1912, the International Amateur Athletic Federation was born. For many years, the pinnacle of athletics competition was the Summer Olympics. But in the 1970s, more world championships in various events began to take place, helping to maintain interest in track and field every year. 21st Century Organization By 2011, nearly 50 outdoor and

25 indoor events fall under the IAAF's authority and rules. Some events, such as the 50-meter sprint, are no longer part of major athletic competitions, but remain part of school programs. Some events have been modified through the years and races of many varying distances are contested every year. In addition to the 26.2 miles of the marathon, there is a 13.1-mile half-marathon. There are men's and women's competitions in almost every event. Men, however, can compete in the 10-event decathlon, while women have the seven-event heptathlon.

The foot racing events, which include sprints, middle- and long-distance events, race walking and hurdling, are won by the athlete who completes it in the least time. The jumping and throwing events are won by those who achieve the greatest distance or height. Regular jumping events include long jump, triple jump, high jump and pole vault, while the most common throwing events are shot put, javelin, discus and hammer. There are also "combined events" or "multi events", such as the pentathlon consisting of five events, heptathlon consisting of seven events, and decathlon consisting of ten events. In these, athletes participate in a combination of track and field events. Most track and field events are individual sports with a single victor; the most prominent team events are relay races, which typically feature teams of four. Events are almost exclusively divided by gender, although both the men's and women's competitions are usually held at the same venue. If a race has too many people to run all at once, preliminary heats will be run to narrow down the field of participants. Track and field is one of the oldest sports. In ancient times, it was an event held in conjunction with festivals and sports meets such as the Ancient Olympic Games in Greece. In modern times, the two most prestigious international track and field competitions are the athletics competition at the Olympic Games and the World Athletics Championships. World Athletics, formerly known as the International Association of Athletics Federations is the international governing body for the sport of athletics. Records are kept of the best performances in specific events, at world and national levels, right down to a personal level. However, if athletes are deemed to have violated the event's rules or regulations, they are disqualified from the competition and their marks are erased.

### Middle Distance Races

#### 800m

This distance combines speed and endurance as well as tactics with athletes completing two laps

of the stadium. The men's race was on the Olympic Games competition schedule in 1896 in Athens, and the women's event was included at the 1960 Olympic Games in Rome.

1500m

Many 800m athletes also compete in the 1500m. The 1500m was on the original programme of the 1896 Olympic Games in Athens, for men, and in 1972 Olympic Games in Munich, for women.

## **2.2 History of Athletics sport In Ethiopia**

Ethiopia has enjoyed a rich tradition of producing some of the world's fastest distance runners over past decades. Although the exact roots of Ethiopian Athletics cannot be retraced back accurately, it is widely believed that the sport was widely practiced in schools and military camps before 1897. The sport was limited to these parts of society only because others did not have access to equipment used for competitions or was not organized in a manner that motivated progress. But after signs that the sport was increasing in popularity in many parts of society, a need to assemble these activities under one organizing umbrella quickly arose. It was in 1961 that the Ethiopian Athletics Federation (EAF) was shaped and soon became a member of the International Associations of Athletics Federation (IAAF). Since its inception, much of the federation's activities were carried with the help of amateurs. The country has had a healthy rivalry with East African neighbours Kenya and this has spurred each nation on to achieve quicker times on both and track and road. The organization was formed in 4 June 1961. The ability of East African athletes was announced to the world in the 1960 Olympics as barefooted Abebe Bikila took the gold medal in the Marathon. Abebe Bikila was the star of marathon running during the 1960s, winning gold at the 1960 and 1964 Olympics and setting a World Record at the latter Games (2:12:11). Bikila repeated in 1964 and the floodgates were opened. Ethiopia has captured 45 Olympic medals, all of them in long distance running through 2012, despite participating in three Olympic boycotts. The organization is also responsible for selecting representatives to other world championship events.

The Ethiopian Athletics Federation has been established since June 4, 1961 (Yekatite 27/53). Through the past 56 years the federation had many great achievements in the athletics sport fields. So, the federation can be nominated as one of the best performing member countries of the International Association of Athletics Federation /IAAF/.

Globally, the Ethiopian Athletics Federation is one of the leading member federations of IAAF especially in long and middle distances. In Continent level, in recent times the Ethiopian athletes are appearing in short distances and field events with medals. In the past some years, the Ethiopian Athletics Federation was giving more and more attention to the short distances and field events of athletics sports, by recruiting and hiring an international coach from US. In doing so the federation got fruits from short distance and field events in continent level. And the vision of EAF, as a national federation, is to be active participant and successful competent in Africa and the world. In order to enhance and develop the succeeding athletes of the future, the national federation of athletics of Ethiopia has exceedingly built and plant athletics sport training centers in different regions of the country. This is the greatest achievement in our history of athletics sports ever.

As the whole world knows, Abebe Bikila (Bare foot runner and winner), Mamo Woldie, Miruts Yifter (Gear changer), Haile Gebresilassie, Derartu Tullu, Getie Wami, Kenenisa Bekele, Tirunesh Dibaba, Meseret Defar, and many other internationally known athletes are the fruits of Ethiopia given to the world. Ethiopia, as it is clearly known by the whole member countries of African athletics sports association, is participating in a very active manner and change oriented mentality in EAAR being as a president for about 3 times, council and technical member to CAA to enhance and contribute its share to the rest of Africa. These showed that Ethiopia is giving her highly great potential, experiences and capabilities to others by participating in all activities of the athletics sports.

The first executive committee was headed by Lt. Colonel Birhane Tefera, the man officially recognized as the first president of the Ethiopian Athletics Federation. This committee started a formalized program where athletes competed domestically and internationally. One of the first and major competitions in the Federation's was the Shewa championships, which was organized in 1966 and was a competition among various divisions of the military members, schools students, and different clubs. Colonel Bekele Yigzaw, and Colonel Zeleke Ergetie were also the next two consecutive presidents of EAF. As seen above, most of the EAF presidents were from the military sectors.

The first ever edition of Ethiopian championships were held in 1971. In the late 70's, a new committee, headed by chairman Mr. Aklilu Yimtatu was formed to administer the federation. The major achievements of this era were the staging of the first Abebe Bikila Marathon and the

national cross country championships. At this moment Ethiopia also participate in the world cross country championships for the first time in 1984. Mr. Asrat H/Giorgis, Mr. Tefera Wasihun, Captain Halefom Miruts, Mr. Mulugeta H/Mariam were also among the presidents who led EAF. This executive committee was also responsible for overseeing many developmental activities of the Federation. Construction of the first athletics track, education and hiring of coaches, and major improvement in working procedures were all hallmarks of the early 80's.

Many years later, the Ethiopian Athletics Federation now has semi-professional organizational structure. It is headed by a nine-member Executive Committee including 2 athletes' representatives which contain a President, Vice President, and an Honorary Treasurer. Mrs. Bisrat Gashawtena was the only female president from 2002 – 2012 in the history of EAF. From 2012 – 2016 EAF was led by Mr. Alebachew Nigussie . Starting from 2016 since then EAF shifted to be led by elite and renowned athletes. In November of 2016, former Olympic gold medalist and Ethiopian long distance running great Haile Gebrselassie was elected president of the Ethiopian Athletics Federation (from 2016 – Nov. 2018.) On November 14, 2018, Double Olympic champion, Her E. Colonel Athlete Derartu Tulu has succeeded Haile Gebrselassie as president of EAF since Nov. 2018 till now. A full-time General Secretary takes care of the day-to day activities of the Federation which now includes four departments- Technical, Public Relations, Development Activities, and Administration and Finance. In recent years, BPR was recalibrated and inaugurated by EAF and EAF has been structured in five departments including the General Secretary Office /GSO/, and internal auditor. Namely:-

1. General Secretary office
2. Technical Department, (in 3 sub – processes.)
3. Resource Mobilization & Communications Support process,
4. Purchase & Finance Support process,
5. Human Resource & Property admin. Support process,
6. Internal Auditor – under the executive committee ([www.ethiopianathleticsfederation.com](http://www.ethiopianathleticsfederation.com))

### **2.3 History of athletics clubs**

Athletics have come to play a major role in the life of high schools and universities across the U.S. today (Griffith, 2004; Hamilton, 2005; Knox, 2007; Mock, 2003; Tublitz, 2007). For several generations, athletics and education have been identified with each other, with the result that sports culture has become embedded within academic culture on many levels. Traditionally, participation in sports was said to make boys into men and help them appreciate teamwork, duty, sacrifice and dedication.

Sports built character, and engendered the values of good sportsmanship in young men. As a result of this tradition, a number of researchers have argued that “organized sports can play a beneficial role in the development of children into educated and well-rounded students” (Griffith, 2004, p. 1). One routinely hears, from podiums and in official school statements, that “high school athletics can have a profound influence on our youth, our schools, and our communities” (Griffith, p. 2). The promotion of sports as a path toward maturity was supported by studies that have found that “participation in extracurricular activities...affect academic performance, attachment to school and social development” among high school students (NHSAW, 2001, p. 9). Participation in sports and related physical education activities “provide opportunities for students to learn the values of teamwork...and the opportunity to apply academic skills in other arenas as part of a well rounded education” (NHSAW, p. 9).

As a result of studies and beliefs like these, high school sports have become a pervasive and powerful presence in most major high school life. In the context of the era of accountability and standardized testing, however, a new scrutiny has been brought to high school sports. Griffith (2004) argued that “there is remarkably little research on the interplay of sports and academic achievement” (p. 1). In other words, research continues to struggle to empirically prove what has been a basic tenet of the rhetoric surrounding sports for years, that participation in sports improves such non-cognitive areas of personal growth as self-motivation and thus may (or may not) have a positive impact on academics as well.

Contributing to the difficulties in examining the interplay between sports and academics at the high school level is the fact that high school sports continue to be professionalized, with pressure bearing downward from a culture of sports that includes intercollegiate and professional sports. For many, participation in high school sports places a young man or woman into a pipeline that leads directly to playing sports in college and even becoming a professional athlete. While this

ideology has justified many of the excesses in high school sports today, empirical research paints a different picture.

For example, the NCAA recently undertook a study to determine how many high school athletes go on to compete at the collegiate level, and even the professional level. The numbers resulting from the study were described as “sobering” (Knox, 2007, p. 1), in the sense that they counteract the prevailing rhetoric. In the area of high school football, for example, in the 2004 high school season 983,000 students played football (Knox, 2007). Only 56,000 of these high school football players went on to play football at the collegiate level. Moreover, “just 0.9%” of high school football players ever ended up playing professional football (Knox, p. 1). The same low percentages of ultimate participation of high school athletes in professional sports, often presumed to be the rationale for intense involvement in high school sports, exist in other sports, with .03% of basketball players, .05% of men’s baseball and .08% of men’s soccer players at the high school level ever making it into professional sports (Knox, 2007). These findings mean two things. First, most high school athletes, if they participate or are being pushed to participate by parents who believe in an easy transition to a lucrative professional sports career, are participating in sports for the wrong reasons. Second, high school athletes laboring under the increased pressure caused by this professionalization inevitably forego academics in order to participate at this level.

As a result of the professionalization of high school sports, many educators at the high school and collegiate level are feeling “increasing tension between our educational mission and the powerhouse of...sports” (Mock, 2003, p. 1). Many educators also worry that “the demands of major collegiate athletics loom so large for some students that they have a disproportionate, unhealthy impact on their lives” (Mock, p. 1).

The professionalization of sports has also begun to cost some schools more to run the sports program than these programs return on investment, monetarily. That is, while many schools argue in favor of sports because they bring much revenue to the school, in truth, many schools spend more on sports than they take in, a cost overrun that sometimes cuts into other activities. Indeed, the NCAA “recently reported that the shortfall across 970 NCAA schools exceeds \$1 billion annually” (Mock, p. 2). As a result of the professionalization of sports, those sports defined as “big money” sports have begun to produce athletes whose lives are disproportionately focused on sports.

In one study of NCAA athletes, it was found that for most sports, which do not take up so much of a student's time and do not make a lot of money for the school, the graduation rate of these student-athletes is more or less the same as the graduation rate for the whole study body, that is, "58% versus 60%" (Mock, p. 2). In the big money sports of football and basketball, however, the graduation rates of student athletes are "embarrassing" (Mock, p. 2). Basketball players graduate fewer than regular students at two thirds of all NCAA division one schools, while "36 institutions graduated (football) players at rates lower than those for their male students who were not athletes" (Mock, p. 2).

Finally, even though most Division 1 NCAA schools have created academic support programs for their student athletes, "some championship-caliber teams had zero graduation rates in multiple (recent) years" (Mock, p. 2). Indeed, another study found that, overall, "two-thirds of male athletes in all sports have grade-point averages that place them in the bottom third of their class" (Mock, p. 2). Nor is the problem limited solely to men, as female athletes also have recorded much poorer academic records than non-athlete students (Mock, 2003).

The professionalization of sports at the collegiate levels has produced other abuses at that level. For example, as collegiate sports continue "inching ever closer to a professional model" (Tublitz, 2007, p. 1), there has been a "marked increase in inappropriate behavior at all levels" (Tublitz, p. 1). With regard to circumventing academic requirements for student athletes, such misbehavior includes cases where admission offices have admitted ineligible students into college because they are athletes and faculty have run fake courses for athletes to gain merely formal grading requirements (Tublitz). While it may be that the era of the "dumb jock, the must-win-at-all-costs coach, and the uncaring professor," (Tublitz, p. 1) is over, too many student athletes are being forced by undue pressure from sports to choose between athletics and academics.

In a recent case, a number of star student athletes at a California university had to choose between competing in a track and field event and participating in their own graduation ceremonies. Many of the athletes chose to attend their graduation, mainly on the grounds that it is a once-only event and that they wanted to share this moment with parents and friends (Carr, 2005). Nonetheless, the administration of the university recommended that the student-athletes compete at the meet, and miss graduation. The fact that the school would put student-athletes in the position of having to make such a choice indicates how wrong-headed current policy has become vis-à-vis the relationships between sports and academics.



A new problem that has developed with regard to the professionalization of athletics at the collegiate and high school levels is when students are tempted by the promise of a quick payday to leave high school or college early, to pursue their athletic careers. The NCAA has recently made it easier for athletes to opt out of college, by not counting their departure as a mark against a school when calculating the annual academic progress rates of all student athletes (On Campus, 2005). This new ruling removes from consideration the issue that, if a student leaves early, his doing so would hurt the overall academic record report of the institution's student athletes. While the ruling states that the athlete's departure will only be "written off" if the student leaves with an acceptable APR, this sort of accommodation to the facts of professional life is typical of how the NCAA "supervises" student-athlete academics. Indeed, schools where student-athletes score at the low end of APRs get a warning the first year and some restrictions on recruiting and playing time in the second year.

Only in the third year do penalties begin to really hurt (including loss of eligibility for postseason play) (On Campus, 2005). In general, colleges must maintain an academic progress rate of 925 per year, and show growth in subsequent years, in order to avoid penalties (Hamilton, 2005). Nonetheless, a practice of transferring from school to school to avoid penalties has emerged, and "there will be waivers and exceptions for schools that come close to the cut score but don't actually make it" (Hamilton, p. 2). Waivers are also issues for small schools and for schools in economically disadvantaged areas. A common practice for high school athletes who have been accepted at colleges is now to attend "spring training camps," as if they were already in college, during the second semester of their senior year (Chicago, 2000, p. 11).

Most of the coaches on the collegiate level see no downside to this practice, in that such a practice helps acclimate high school players to the pressures of college sports early (Chicago, 2000). These players do, however, essentially leave high school early in order to concentrate solely on their sporting future. In general, then, the professionalization of sports at the collegiate and high school levels has created a culture where athletics and academics appear to be working at cross purposes.

In order to repair this negative trend, efforts must be made to "re-integrate athletics into the values, goals and mission of our institutions" (Tublitz, 2007, p. 1). In order to do this, sports must "be in alignment with the academic mission" of the school.

Moreover, sports must “complement rather than supplant the goals of education and personal growth” (Tublitz, p. 1). The COIA report, *Framing the Future: Reforming Intercollegiate Sports*, suggested several reforms which could greatly alleviate the current stress between athletics and academics. First, the student-athlete advisement and support structure must be re-structured to focus on authentic academic experience “and not just to maintain their athletic eligibility” (Tublitz, p. 2). This entails taking advising away from the athletic department and returning advising to the academic departments and their advising structures. The advisors themselves should belong to the academic departments and not be hires of the athletic department. Finally, “academic advising of athletes should be overseen and regularly reviewed by the campus academic advising structure or the office of the chief academic officer” (Tublitz, p. 2). More relevant to high school student-athletes, the eligibility requirements of collegiate sports must, Mock (2003) argued, be toughened up.

At present, “a college bound athlete is now required to complete only 13 academic core courses in high school and can be eligible for NCAA participation with as little as two years each of math and science” (Mock, p. 2). If, once in college, a high school student performing at this level continues to maintain this level of performance in academics, he would not graduate. As a result, the number of core courses required of student-athletes should be increased so that student-athletes actually have a chance of graduating. Finally, a trend which has impaired student-athletes who wish to focus on their academics is “spiraling practice requirements.” Some teams now have “voluntary” practices at off hours and during offseason, in effect making student-athletes into full-time athletes. At present, “the current pattern of activities significantly limits their ability to participate fully in the academic programs of the university” (Mock, p. 3).

The question, then, regarding whether or not participation in athletics may actually help student-athletes perform better academically, may be mired in the realities of the new pressures and tensions created between athletics and academics by the climate of professionalization of sports in schools. As a result, this study will examine the status quo in high school sports with regard to unfair or imbalanced practices in sports, as related to academics. It will then review case studies in which some balance between athletics and academics has been restored. Addressing the research question more directly, the review will then examine case studies which indicate that participation in athletics can result in non-cognitive personality traits that translate into improved achievement in academics among students. Finally, the question of whether or not actual

participation in sports or physical education at the high school level can contribute to improved grades as well will be addressed, with case studies demonstrating that such a link may indeed be viable.

## **2.4 Student Athletes and Academics**

The primary conceptual problem facing student-athletes is whether or not sports, as an activity, has a positive impact on other endeavors in life, including academics (Baucom & Lantz, 2000; Clark, 2002; Coleman, 2006). At present, researchers have looked for both indirect and direct connections. Indirect connections consist of ways in which sports improve various non-cognitive aspects of an athlete's personality—self esteem, motivation—and how that improvement in turn leads to better academic achievement. Direct connections consist of ways in which competition in sports helps student-athletes actually perform better in such similarly competitive events as academic tests and courses.

In both cases, the problem remains how to build a construct that allows one to envision how impact is felt across the supposed gap between mind and body. One of the first researchers to explore this question was James Coleman, who characterized adolescent culture as distinct from adult culture, and focused on “cars, dates, sports, popular music, and other matter...unrelated to school” (Coleman, 2006, p.1). Most of all, adolescent culture is characterized by “little interest in education” (Coleman, p. 1). Coleman's (2006) claim that adolescents pay little attention to scholastic achievement was suggested to him by answers to a questionnaire. He asked students, “if you could be remembered here at school for one of the three things below, which one would you want it to be: brilliant student, star athlete or most popular?” (Coleman, p. 2).

Forty percent of boys responded that they would want to be remembered as a star athlete, with less than 30% wanting to be remembered as a brilliant student.

When probing why this should be so at a school, Coleman posited that an institution as a whole makes demands upon members, and that in institutional contexts the group holds down all students to a “level which can be maintained by all” (Coleman, p. 3). If anyone is a “curve-buster,” then classmates ridicule or exclude him or her in order to return the curve to a normative level. Thus, “in a high school, the norms act to hold down the achievements of those who are above average, so that the school's demands will be a level easily maintained by the majority” (Coleman, p. 3). As a result of this, “grades are almost completely relative, in effect ranking students relative to others in their class” (Coleman, p. 3). In studies, Coleman found that while

there is a collective response against curve-raisers, “there is no epithet comparable to ‘curve-raiser’” in sports, and star athletes do not suffer ostracism. This may be because all are aware of the fact that athletes represent the group and do not in essence compete for themselves as individuals. Thus, high school culture, as it is, tends to validate sports achievement and limit academic achievement. Coleman’s solution to this problem was to provide schools with both interscholastic and intramural competition “in scholastic matters” so that students can come to see academic achievement as comparably representative of the group, as in sports achievement. He provided an example of a small high school, too small to mount a sports team, compensating for its size by successfully competing in statewide music competitions. As a result, “it is a thing of pride to be a trombone soloist in this school, and the leading boys in the school are also leading musicians—not, as in many schools, scornful of such an unmanly activity” (Coleman, 2006, p. 5). Thus, the response to the current imbalance between sports and academics in high school is to instrument the “shift in the competitive structure of high schools” that changes the norms of the school, so that academics are valued and even encouraged (Coleman, p. 5). In this way, “change the competitive structure of the high school and we can change them from places of athletic to academic prowess” (Coleman, p. 5). In sum, Coleman’s answer to whether or not sports achievement influences academic achievement is simple: achievement is what counts, and the competitive structure of the school alone accounts for which type of achievement—sports or academics—is valued. If the competitive structure of the high school is balanced, sports and academic achievement are likely to intermix; if imbalanced, sports achievement may come at the expense of academic achievement.

Another study explored a similar issue related to the structure of thinking in high schools: prejudice against athletes. The study took place in a college context, but with the professionalization of sports it undoubtedly has spread to high school as well. Prejudice against student-athletes and stereotypes like the aforementioned “dumb jock” are the results of “the perceived incompatibility between the goals of big-time college athletic programs and the basic values of academic integrity and academic excellence in higher education” (Baucom & Lantz, 2000, p. 265). Thus, it is common for resentful teachers to stereotype all student athletes as “being less intelligent than their non athlete-student peers and [these teachers] may harbor prejudices based on their perception that student-athletes receive special benefits due to their status on campus” (Baucom & Lantz, p. 265).

Studies have affirmed that both faculty and fellow students do in fact harbor such prejudices against student-athletes. Other studies have shown that prejudice against athletes also occurs in Division III schools known for their academic prowess (Baucom & Lantz, 2000), even when student-athletes at these schools are more representative of the student body as a whole. Baucom & Lantz's study to determine the presence of faculty prejudice against student athletes found that such prejudice does exist, but that it is often based on faculty misconceptions regarding the nature of the scholarship a student-athlete is on, and whether or not his or her presence at the school is perceived to compromise the academic status of the school as a whole. The result of this finding is that faculty prejudice reinforces the perceived gap between athletics and academics and, once athletes enter the classroom, reinforces the gap, contributing to the negative reception of athletes in the classroom. Faculty prejudice is thus one more aspect of the overall competitive structure of a school, in this case contributing to the poor performance of student athletes in the classroom (Baucom & Lantz).

As a result of the inheritance of such overly binary competitive structures in schools, much research has worked to redefine the student-athlete as a kind of special needs student, for whom programs of support and assistance must be created, in the manner of programs for special education (Clark, 2002). The new construct of the student-athlete sees in him or her both the student AND the athlete, rather than focusing solely on the latter. Thus, student-athletes are not just athletes but “a unique population of young adults who lead stressful lives influenced by the unique demands of their lifestyles” (Clark, p. 1). As a result, “such unique demands require special services to assist them to respond appropriately and become well-adjusted, successful adults” (Clark, p. 1). The support programs consist of “holistic programs that address psychosocial issues in academics and athletics” and provide help to student-athletes in all areas of their lives as students (Clark, p. 1). Thus, a student-athlete is viewed as “an individual with changing needs and skills, rather than exclusively as an athletic participant” (Clark, p. 1).

Specifically, student-athletes are offered life skill development programs. Formerly, many perceived that, because they were on scholarships, student-athletes had all their needs met at school. Studies have shown that not only was this not true, but that the perception that it was caused schools to allow student-athletes to fall through the cracks (Clark, 2002). In fact, studies have shown that the environment that the student athlete enters into is often “exploitative, developmentally damaging, socially alienating, and generally non-supportive” (Clark, p. 4).

The demands of sports also mean that student-athletes are generally “more vulnerable to developmental crises and psychological distress problems than non athletes” (Clark, 2002, p. 4). This means that, counter-intuitively, student-athletes need more assistance in working through the competing demands placed upon them than non-athlete students. On the collegiate level, the CHAMPS Life Skills program was designed to address the developmental needs of student-athletes. The program helps athletes think about life after sports (again, only very few athletes, even on the collegiate level, turn professional), and assists them in contributing more fully to their academic communities (Clark, 2002). A number of studies have also found that most student-athletes who are negatively characterized by fellow students and even faculty as “dumb jocks” in fact suffer from learning disabilities, and champs makes sure that educators trained in helping young adults with learning disabilities assist these students in the classroom (Clark).

The SAA approach helps these students with planning, monitoring their progress, and turning all work in on time. This assistance entails constantly monitoring student athletes so that they maintain their rate of progress, and thus their eligibility for participating in sports (Clark, 2002). Report cards are closely monitored, and, should a problem emerge, meetings called to develop new strategies for improving grades. Self reports are also used to help students keep on track and to “reinforce the expectation that they will assume increasing responsibility for their education, an expectation that is a cornerstone of developmental advising” (Clark, p. 6).

In sum, the overall rationale of such support systems of newly-defined student athletes is that “effective education cannot be delivered for student-athletes...in the absence of critical supports that address their unique needs” (Clark, p. 6). The growth of these programs, though they lag behind in helping student-athletes with learning disabilities, is an indication that colleges are at least compensating for, or attempting to redress, imbalances in the competitive structure of schooling by providing an advisory structure that supports student-athletes and their special needs. In the context of this new paradigm, it appears much more likely that research will answer the question: to what extent does participation in sports contribute to academic achievement among student athletes?

At present, two streams of research seek an answer to this question. One area of research examines how participation in athletics produces non-cognitive advantages that may translate into higher academic achievement. A second area of research explores how athletic participation leads directly to academic achievement in some populations of student-athletes.

## **2.5 Task and ego orientation**

Sport as a social and behavioral event cultivates some values but the type of the values promoted depends closely by the way various sports are taught and applied. The course of physical education is probably the most appropriate area for the growth of ethics, since it is for all students, is less commercial and bureaucratic, it is organized, has rules and regulations, do not emphasize on competition and winning and the kids are under the supervision of the teacher (Shields & Bredemeier, 1995; Hasandra , 2006). Teaching of sports therefore by its own without including special strategies that aim to ethical growth, is not possible to produce positive changes (Hasandra 2006). For these reasons during the last twenty years studies have been done in the area of physical education and sport in order to examine the relationship among: school and team sports, ethical behavior and the psychological factors of internal motivation, urge and goals.

According to Ames (1992) goal orientation and urge define the selection of task, the level of effort, persistence, the perception of ability and the definition of success and failure. Other studies by Kleiber & Roberts, (1981) Orlick, (1981), by using competitive and non competitive conditions concluded that the behavior of an athlete depends on his/her orientation. Nicholls (1984,1989) stated that ego oriented individuals perceive ability and success from a canonical perspective while task oriented individuals deal mostly with learning and is possible to adopt more inherent motive schemes such is the development of ability and enjoyment (Papaioannou & Theodorakis, 1994). According to Diggelidis & Krommydas (2008), task and ego are orientations representing opposite views on ability and the definition of success. Task oriented athletes present a pro social behavior and judgment in contrary to ego oriented athletes. These individuals perceive success differently, make less effort to approach it and are affected by outside rewards.

The more ego oriented an individual is the most will try to outmatch his/her friends and the most will believe that this effort to outmatch others may lead to success. On the contrary the more task oriented an individual is the most he/she believes that success depends on effort, interest and pursue of new abilities (Treasure & Roberts, 1995). Most of these studies showed that task orientation is significantly related to positive moral behaviours, while ego orientation appears to be significantly related to unsportsmanlike behaviours (Dunn & Dunn, 1999; Proios, Athanailidis, 2004). In contrast t-o these findings, there are other studies that claim that task orientation is not significantly related to moral behaviours (Kavussanou, 1997; Stephens& Bredemeier, 1996).

Finally it should be noted that the growth of moral behavior is especially important for society. Physical education and sports according to Shields & Bredemeier (1995) is the ideal environment for moral growth. Another factor affecting the behavior of athletes is athletic identity. Athletic

identity is defined as the level on which an individual determined as an athlete is a social product and is greatly affected by the opinion of friends, family, coaches and the mass media. Other definitions given for athletic identity include: the commitment of an individual to sports or the “level of maturity and understanding of an athlete regarding his/her effort to maximize opportunities (e.g. business or social) and most important for former and present members of his/her athletic community, the level on which an individual is determined as an athlete (Kent 2007). he/she is actually and athlete. According to those asked and athlete is determined by competitiveness, determination, self esteem, self discipline and dedication to achieving a goal.

At a recent study by Reifsteck, Erin J.M.S.(2011) athletes were asked to determine the term athletic identity. From those that answered 34% stated that athletic identity is the continuous effort for excellence in various sports, 17% answered that athletic identity means for someone to be physically capable, 15% to show strong devotion in education and sports and 34% stated that athletic identity is the perception of an individual.

## **2.6 Concept of Physical Fitness**

Physical fitness can be defined and measured in different ways. A basic definition of physical fitness is the ability to complete daily tasks with energy reduce health risks due to inactivity, and be able to participate in a variety of physical activities. Physical fitness components are currently divided into two groups--health-related and skill related. Those that are health-related are designated to improve health, wellness, and the quality of life the building of these can also enhance sport performance. The 5 health-related elements are: muscular strength, cardiovascular endurance, muscular endurance, flexibility, and body composition. Physical fitness is an individual quality that varies from person to person. It is influenced by age, sex, heredity, personal habits, exercise and eating habit practice. Physical fitness is all encompassing; it is a state characterized the degree to which the individual is able to live most and to serve best. The ability to function emotionally, socially and spiritual components of fitness, all of which are related to each other and mutually interdependent (AAPHERD, 1989).

Historically, physical fitness was conceived in simple terms as consisting of strength, endurance, speed agility, coordination and balance. The National Youth fitness testing was started in 1950s around the world on a limited scale, which has become much more complex in 1980s. The health-related fitness test was developed to assess minimum levels of strengths, endurance and flexibility. This test stimulated the American Association of Health, physical Education and



Recreation (AAHPERD) to develop a battery of test. The present concept of physical fitness emphasizes two broad areas of fitness, which includes health related fitness and skill or performance - related fitness. Health related fitness comprises cardio respiratory endurance, muscular endurance, muscular strength, body composition and flexibility. Skill or performance - related fitness includes agility, balance, coordination, speed, power and reaction time (AAHPERD, 1984).

Physical fitness can be subjectively measured by determining how much energy one has for doing what is enjoyable in life and for experiencing all the natural adventure possible. Engaging in activities from snow skiing to mountain climbing, cycling, those who are physically fit have the energy and zest to maximize the enjoyment of the natural resources available to them. Gaurav et al. (2011), stated that players were assessed for physical fitness components such as speed, strength and power. Physical fitness is not easily understood by examining its components or “parts”. There is widespread agreement that these four components are basically: a. Cardio-respiratory endurance is the ability to deliver oxygen and nutrients to tissue, and to remove wastes, over sustained periods of time. Long runs and swims are among the methods employed in measuring these components (United States president’s council on physical fitness and sports, 2005).

b. Muscular strength is the ability of a muscle to exert force for a brief period of time. It is the maximum amount of force that one can generate in a specific movement pattern at a specific velocity of contraction. The definition used to be more simple - the ability to lift a maximum weight. The new definition reflects more specificity in the nature of a movement where strength is required. Upper body strength, for example can be measured by various weight-lifting exercises (United States president’s council on physical fitness and sports, 2005). When athletes make significant strength gains, muscles fibers (cells) gain size. Weightlifting requires considerable strength, but all sports also require some level of strength fitness.

c. Flexibility - the ability to move joints and use muscles through their full range of motion. It is the ability of a joint to move freely through its range of motion (ROM). Gymnastic events require substantial joint flexibility. Various methods of stretching can increase flexibility. The sit and reach test is a good measure of flexibility of the lower back and backs of the upper legs (United States President’s Council on Physical Fitness and Sports; 2005). The AAHPERD committee adopted the position that physical fitness testing and programme for development of fitness should emphasize the relationship between health and physical activity. Physical fitness is a

multiphase continuum extending from birth to death. It is affected by physical activity, ranges from optimal abilities in all aspects of life through high and low levels of different physical fitness, to severely limiting disease and dysfunction. Since physical fitness can be operationally defined by the test items used for its evaluation, specific criteria were needed for choosing the test items. The criteria selected were as follows:

i. Simple physical fitness can be operationally defined by the test items used for its evaluation, specific criteria were as follow: Physical fitness test should measure at range which extends from severely limiting dysfunction to high levels of functional capacity. It should accurately reflect an individual's physical fitness status as well as changes in functional capacity by corresponding test scores and changes in these scores (U.S.PC.F.S, 2005).

ii. The following areas of physiological function are related to positive health, one of which is concerned and appeared to meet the above criteria. Cardiorespiratory function Body composition Abdominal and harmstring musculoskeletal function (USPCPFS, 2005). AAPHERD, (1980), stated that physical fitness is an expression of physical development in a number of discrete areas that can be classified into two major categories. Namely, health related physical fitness and the performance related physical fitness, each with its own specific components as listed below.

1. Health related physical fitness

Cardiorespiratory endurance

Muscular strength

Muscular endurance

Body composition

Flexibility

2. Performance related physical fitness

Balance

Agility

Power

Speed

Reaction time

Coordination

Speed, agility, and quickness all involve learned motor skills. Although the magnitude of proficiency will vary with each individual, learning the efficient and effective execution of these skills can improve overall athletic ability. The concept of agility is difficult to precisely

define operationally, even though there is general agreement among coaches, athletes and researchers as to what is meant by the term agility (Wilmore, 1977). Agility typically refers to the ability to move and change position or directions, rapidly without losing balance or sacrificing space.

Generally, agility can be defined by the ability to explosively start, decelerate, change direction, and accelerate again quickly while maintaining body control and minimizing a reduction in speed Arthur & Bailey (1998); Cissik & Barnes(2004); Plisk(2008). Universally, agility can often be described as an athlete's collective coordinative abilities Tittel(1991); Drabik(1996); Plisk(2008). These are the basic elements of technical skills used to perform motor tasks spanning the power spectrum from dynamic gross activities to fine motor control tasks and include adaptive ability, balance, combinatory ability, differentiation, orientation, reactivity, and rhythm Plisk(2008). Coordinative abilities are often recognized to be most easily developed in preadolescence, which is considered to be an important time period for skill development Viru(1995); Dick(2007); Balyi(2004). This period often changes focus during adolescence when the shift from general to special preparation should begin.

Most athletic activities that utilize agility occur in less than 10 seconds and involve the ability to coordinate a few or several sport specific tasks simultaneously (like catching a football and then making a series of evasive moves and cuts to avoid being tackled in order to advance the ball further down the field Cissik & Barnes(2004). With the exception of skills specific to the sport, agility can be the primary determining factor to predict success in a sport Halberg (2001). Sports inherently require changes of direction in which lateral movements are used in the several planes of movement simultaneously. Sports regularly are played in short bursts of 30 feet (10 yards) or less before a change of direction, acceleration and/or deceleration is required. Because movements can be initiated from various body alignments, athletes need to be able to react with strength, explosiveness and quickness from these different positions. Wilmore, (1977), stated that "there are no universally accepted tests of agility, although many test batteries exist which use various shuttle run tests to estimate the agility components. The shuttle run test has been used to measure the agility of students in running and changing direction and reliability coefficient of 0.94 for boys and 0.82 for girls were reported. Gabbett (2005) evaluated physiological and anthropometric characteristics of specific playing positions and positional playing groups in junior rugby league players. Two hundred and forty junior rugby league players were measured for standard anthropometry, muscular power,

speed, agility and estimated maximal aerobic power during the competitive phase of the season were taken, after players had obtained a degree of match fitness. The results of the study demonstrated that few physiological and anthropometric differences were exist among individual playing positions in junior rugby league players, however props were taller, heavier, have greater skinfold thickness, lower speed, agility, and estimated maximal aerobic power than other positional playing groups. Power is the resultant of force multiplied by displacement divided by time (Noffal & Lynn, 2012), the ability to achieve more force over the same distance and time period would increase power.

Speed, agility, and quickness are some of the most significant, and visible, components of athletic success. An improvement in the ability to react quickly, apply significant force rapidly in the appropriate direction, and to redirect that force if needed is the ultimate goal of a program to improve speed, agility, and quickness. A carefully designed program that addresses these factors of athleticism significantly improves overall performance and reduces the risk of injury. Speed, mostly in the form of acceleration, is an important factor in almost all games and sports, it becomes a determinant in scoring, passing and defending or preventing a goal, in other words, speed makes the difference where one is able to gain an advantage over an opponent. According to Wilmore, (1977), speed can be accomplished for the individual body segments, such as for the arm or leg, by using an elaborate system or micro switches and electronic timer, total body speed can be measured by timing the athlete over a set distance from 50-100 meters.

Muscular power, often called explosive strength, is a combination of strength h and speed. This is the ability to realize maximum force in the fastest possible time. Also, it is known as the ability to exert a maximum contraction at one explosive act. Stability, strength, and power training help shift the force-velocity curve up and to the right. While stability training develops appropriate balance, strength training improves the body's ability to create force, and power training aids in decreasing the amount of time needed to create that force. These all have significant contributions in regards to improving speed. When performing stability, strength, and power drills specific for speed development, it is important to include exercises for contributing areas, such as the feet, anterior and posterior muscles of the shins, the core, and hip flexors/extensors as part of a whole-body program. In addition, movements that emphasize powerful plantar and dorsiflexion of the ankle, as well as extension and flexion of knee and hip

are also important components. Ballistic movement, as found in speed, agility, and quickness training, is created by a forced and rapid lengthening of a muscle immediately followed by a shortening of the muscle, creating an elastic “rubber-band-like” effect of energy release. As mentioned in the above, this ability to store and release energy is referred to as the stretch-shortening cycle and is affected by the intrinsic qualities of the muscle and the involved musculotendinous junctions. This action is often reflexive, and referred to as the “stretch reflex.” Training the muscle and tendon’s ability to load eccentrically and rapidly release energy concentrically improves the magnitude and effectiveness of the stretch-shortening cycle. This is achieved through power training and plyometric. Muscular power according to Jensen and Nelson, (1972), is the ability to applied force rapidly power is typically demonstrated in perfecting the body... (as in jumping) or an object (as in throwing). The muscles must apply great force at a rapid rate in other to give the body of object the momentum necessary to carry it in the desired distance. Explosive strength is very important to vigorous performances because it determines how hard a person can hit, how far he can throw, how high he can jump and to some extent, how far he can run. Running is a series of body projections, therefore leg power is essential to fast running.

Power is the resultant of force multiplied by displacement divided by time (Wisløff et al., 2004), the ability to achieve more force over the same distance and time period would increase power. Therefore, increasing strength should translate to increased power in professional athletes (Noffal et al., 2012). Nelson & Jensen, (1972), explosive strength can be increased by increasing the strength without sacrificing speed or by increasing the speed movement without sacrificing strength, or by increasing both the speed and strength. According to fisher and Jensen, (1979), increasing strength affords the greatest potential for improving power because strength can usually be increased by a significant amount while speed can be improved with a very limited amount. Neuromuscular Adaptation – Agility training may be the most effective way to address the neuromuscular system and sport-specific skills necessary for sport performance, since agility training most closely resembles the sport itself Cissik, et al. (2004). Training at sport-specific

metabolic training speeds enables athletes to train at a level that most closely resembles the intensity, duration, and recovery time found in sport during the off-season. The use of agility training in an annual training cycle provides a critical link for athletes to apply their strength and conditioning program gains to the competitive athletic arena. Explosive strength can be

assessed very accurately within the laboratory using expensive force transducers and recorders. (Wilmore 1977). Several field tests have been in use but lack objective validation. The sitting shot put and medicine ball throw have been used to estimate upper body power while standing broad jump and vertical jump have been used to estimate lower-body power.

Balance; The human body rest on a base of support defined as area of contact between the body and supporting surface. if the base of support and other factors remain constant, the stability is said to be achieved, when an even adjustment exist between opposing forces of a body, that body experiences a condition known as balance (Ecker, 1971). Technically speaking, a body is said to be in a state of equilibrium when it doest not take a new position with the slightest application of force VO<sub>2</sub>max stands for maximal oxygen uptake and refers to the amount of oxygen your body is capable of utilizing in one minute. It is a measure of your capacity for aerobic work and can be a predictor of your potential as an endurance athlete. Although there are many factors that affect your VO<sub>2</sub>max, it is a commonly accepted measure of cardio respiratory fitness. Cardiorespiratory endurance is the most vital means of determining a person's maximal oxygen uptake (Vo<sub>2</sub> max)(Mathew, 1981). Maximal oxygen uptake, according to Verducci (1980), indicates how well various physiological functions can be adjusted to increasing metabolic demand of work. There are many physiological factors that combine to determine VO<sub>2</sub> max but which of these are most important? Two theories have been proposed:

a. Utilization Theory: This theory maintains that aerobic capacity is limited by lack of sufficient oxidative enzymes within the cell's mitochondria Wilmore & Costill, (2005). It is the body's ability to utilize the available oxygen that determines aerobic capacity. Proponents of this theory point to numerous studies that show oxidative enzymes and the number and size of mitochondria increase with training. This is coupled with increased differences between arterial and venous blood oxygen concentrations (a-vO<sub>2</sub> difference) accounting for improved oxygen utilization and hence improved VO<sub>2</sub>max.

b. Presentation Theory: The theory suggests that aerobic capacity is limited not predominantly by utilization, but by the ability of the cardiovascular system to deliver oxygen to active tissues. Proponents of this theory maintain that an increase in blood volume, maximal cardiac output (due to increased stroke volume) and better perfusion of blood into the muscles account for the changes in VO<sub>2</sub>max with training. So what plays the greater role in determining an athlete's VO<sub>2</sub> max - their body's ability to utilize oxygen or supply oxygen to the active tissues? Saltin and Rowell (1980), concluded that it is oxygen supply that is the major limiter to endurance

performance. Studies have shown only a weak relationship between an increase in oxidative enzymes and an increase in VO<sub>2</sub> max Costill, Thomas, Roberg, Pascoe, Lambert, Barr & Fink, (1991). One of these studies measured the effects of a 6-month swim training program on aerobic function. While oxidative enzymes continued to increase until the end, there was no change in VO<sub>2</sub> max in the final 6 weeks of the program Costill, et al. (1991); Kemi, Hoff, Engen & Wisloff (2003). Over the years, various tests were developed to measure Vo<sub>2</sub> max, but most of these tests require laboratory settings. Such tests include treadmill running/walking, cycle ergo-meter pedaling and stepping tests. Again, most of these tests cannot be used on large populations at the same time because of cost of equipment, time limitation. To overcome these limitations, varied field tests were developed as alternative tests. These tests are not only reliable when compared to the laboratory tests, but found to be more convenient when large samples are involved. Some of these field tests include 6 minutes, 9 minutes and 12 minutes run and the 72 mile run tests. Cooper (1968), designed a 12-minute run/walk test, which was considered suitable when compared with laboratory test. Pollock, et al., (1990), stated that the widely used tests for measuring Vo<sub>2</sub> max and the 12 minute and the 1 mile run tests. The contributions of metabolic, physique and mechanical variables to athletic performance are functions of distance and intensity. Maximal oxygen uptake (Vo<sub>2</sub> max), running economy, and lactate threshold are metabolic variables that increase in performance as distance increases (Brandon, 2000). Long distance runners (runners that compete in 5000 meters or longer), typically have higher Vo<sub>2</sub>.max values, use oxygen more efficiently and have lower lactate accumulation than significantly middle distance runners (runners that compete in 8000 meters or 3000 meters) (Berg and Bell, 1992). Evaluating variables that influenced athletics performance, Ramsbotton, (2001), found strong relations between a five kilometer athletic performance and Vo<sub>2</sub> max, relative, running economy in male recreational runners. Daniel, (2000), concluded that middle distance runners are able to work at 90 to 100% of their Vo<sub>2</sub> max up to 10 or 11 minutes while accumulating a high blood lactate level, because the variables in the Ramsbolton, (2001), study were not evaluated by a composite statistical analysis and were at distance longer than 3000m. Since middle distance runners are able to work at a high percentage of Vo<sub>2</sub> max in the presence of a high lactate accumulation, lactate threshold and running economy do not appear to strongly influence middle distance runners' performance (Cureton, 1992).

## Chapter Three

### 3. Research methods

#### 3.1 Description of the study area

The study area was in Adama, Gelan and Oromia road authority Athletics club of Oromiya regional state, because of the consistency of training variable of physical fitness, speed agility and endurance given in Adama Gelan and oromia road authority. It is also one of the potential areas to find critical athletes in the country level.

Adama (Oromo: Adaamaa or Hadaamaa; Amharic:ÄAdama, ĀAdama),so,known as Nazret or Nazret h (Amharic: Nazret), is a city in central Ethiopia and the previous capital of the Oromia Region. Adama forms a Special Zone of Oromia and is surrounded by Misraq Shewa Zone. It is located at 8.54°N 39.27°E at an elevation of 1712 meters, 99 km southeast of Addis Ababa. The city sits between the base of an escarpment to the west, and the Great Rift Valley to the east ([www.adamacity.com](http://www.adamacity.com) ).



Map of the Study Site (Source: [www.ethiomappingagency.com](http://www.ethiomappingagency.com))



### 3.2 Research design

The study design was experimental research design which enables to study the comparison of the study of selected physical and psychological measurement with Adama, Gelan and oromia road authority athletics club. In this research mainly quantitative research design was employed to quantify the number found from the respondents.

### 3.3 Total population, target Population and sample size of the study

	Total population				Target population				Sample (using random technique)			Remark	
	M	F	T		M	F	T		M	F	T		
1	Adama	30	35	65		26	29	55		10	11	21	Middle distance runners
2	Galan	19	17	36		15	13	28		9	6	15	
3	ORA	38	12	50		31	9	40		12	4	16	
	<b>Total</b>	<b>87</b>	<b>64</b>	<b>151</b>		<b>72</b>	<b>51</b>	<b>123</b>		<b>31</b>	<b>21</b>	<b>52</b>	

### 3.4 Method of data collection

Data was gathered through physical fitness assessors by agility, shuttle run, zig zag cooper test and task and ego orientation.

#### 3.4.1 Physical fitness

(Mackenzie, 2005)

##### 3.4.1.1 Speed

Speed, mostly in the form of acceleration, is an important factor in almost all games and sports, it becomes a determinant in scoring, passing and defending or preventing a goal, in other words, speed makes the difference where one is able to gain an advantage over an opponent. According to Wilmore, (1977), speed can be accomplished for the individual body segments, such as for the arm or leg, by using an elaborate system or micro switches and electronic timer, total body speed can be measured by timing the athlete over a set distance from 50-100 meters.

Shuttle Run Test; the objective of this test is to assess the athlete's ability to accelerate between marked lines and to rapidly change direction.

Required resources

To undertake this test you will require:

2 marked parallel lines 9.14m (30ft) apart

2 wooden blocks 5cm x 5cm x 10cm

Stop watch

Assistant

How to conduct the test;

The athlete is required to sprint from the starting line to pick up a block and then place it on the ground behind the starting line. The athlete then sprints to pick up the second block and turns to sprint over the starting line. The stopwatch is started on the command "Go" and stopped when the athlete's chest crosses the line. An attempt is not counted if the block is dropped rather than placed on the floor. Also the block must be placed behind and not on the line. Repeat the test 3 times. Record the best time

Analysis

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

Target group

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

Reliability

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

## Males

	very poor	poor	fair	average	good	very good	excellent
12 - 13 yrs	< 3/3	3/4 - 5/1	5/2 - 6/4	6/5 - 7/5	7/6 - 8/8	8/9 - 10/9	> 10/9
14 - 15 yrs	< 4/7	4/7 - 6/1	6/2 - 7/4	7/5 - 8/9	8/10 - 9/8	9/9 - 12/2	> 12/2
16 - 17 yrs	< 5/1	5/1 - 6/8	6/9 - 8/2	8/3 - 9/9	9/10 - 11/3	11/4 - 13/7	> 13/7
18 - 25 yrs	< 5/2	5/2 - 7/1	7/2 - 8/5	8/6 - 10/1	10/2 - 11/5	11/6 - 13/10	> 13/10
26 - 35 yrs	< 5/2	5/2 - 6/5	6/6 - 7/9	7/10 - 8/9	8/10 - 10/6	10/7 - 12/9	> 12/9
36 - 45 yrs	< 3/8	3/8 - 5/3	5/4 - 6/4	6/5 - 7/7	7/8 - 8/9	8/10 - 11/3	> 11/3
46 - 55 yrs	< 3/6	3/6 - 4/6	4/7 - 5/5	5/6 - 6/6	6/7 - 7/7	7/8 - 9/5	> 9/5
56 - 65 yrs	< 2/7	2/7 - 3/6	3/7 - 4/8	4/9 - 5/6	5/7 - 6/8	6/9 - 8/4	> 8/4
> 65 yrs	< 2/2	2/2 - 2/5	2/6 - 3/7	3/8 - 4/8	4/9 - 6/1	6/2 - 7/2	> 7/2

## Females

	very poor	poor	fair	average	good	very good	excellent
12 - 13 yrs	< 2/6	2/6 - 3/5	3/6 - 5/1	5/2 - 6/1	6/2 - 7/4	7/5 - 9/3	> 9/3
14 - 15 yrs	< 3/3	3/4 - 5/2	5/3 - 6/4	6/5 - 7/5	7/6 - 8/7	8/8 - 10/7	> 10/7
16 - 17 yrs	< 4/2	4/2 - 5/6	5/7 - 7/1	7/2 - 8/4	8/5 - 9/7	9/8 - 11/10	> 11/11
18 - 25 yrs	< 4/5	4/5 - 5/7	5/8 - 7/2	7/3 - 8/6	8/7 - 10/1	10/2 - 12/7	> 12/7
26 - 35 yrs	< 3/8	3/8 - 5/2	5/3 - 6/5	6/6 - 7/7	7/8 - 9/4	9/5 - 11/5	> 11/5
36 - 45 yrs	< 2/7	2/7 - 3/7	3/8 - 5/3	5/4 - 6/2	6/3 - 7/4	7/5 - 9/5	> 9/5
46 - 55 yrs	< 2/5	2/5 - 3/5	3/6 - 4/4	4/5 - 5/3	5/4 - 6/2	6/3 - 8/1	> 8/1
56 - 65 yrs	< 2/2	2/2 - 2/6	2/7 - 3/5	3/6 - 4/4	4/5 - 5/6	5/7 - 7/2	> 7/2
> 65 yrs	< 1/5	1/5 - 2/1	2/2 - 2/6	2/7 - 3/4	3/5 - 4/3	4/4 - 5/7	> 5/7

Figure 1; shuttle run test: source ([www.topenedsports.com/](http://www.topenedsports.com/) Accessed Thursday August 27, 2020)

### 3.4.1.2 Agility

Agility typically refers to the ability to move and change position or directions, rapidly without losing balance or sacrificing space. Generally, agility can be defined by the ability to explosively start, decelerate, change direction, and accelerate again quickly while maintaining body control and minimizing a reduction in speed Arthur & Bailey (1998); Cissik & Barnes(2004);

Plisk(2008). Universally, agility can often be described as an athlete's collective coordinative abilities Tittel(1991); Drabik(1996); Plisk(2008).

### Zig-Zag Test

The objective of the zig-zag test is to monitor the athlete's speed and agility.

Required resources

To undertake this test you will require:

5 cones

Non slip surface

Stop watch

Assistant

How to conduct the test

The Zig-Zag Test is conducted as follows:

Mark out the course with four cones placed on the corners of a rectangle 10 by 16 feet, with one more cone placed in the centre.

The athlete follows the grey route identified on the diagram

The athlete completes one circuit of the course starting and finishing at the Start/Finish cone

The assistance records the time for the athlete to complete the course.

Analysis

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

Target group

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

Reliability

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

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<25.0	25.0 - 30.9	31.0 - 34.9	35.0 - 38.9	39.0 - 41.9	>41.9
20-29	<23.6	23.6 - 28.9	29.0 - 32.9	33.0 - 36.9	37.0 - 41.0	>41.0
30-39	<22.8	22.8 - 26.9	27.0 - 31.4	31.5 - 35.6	35.7 - 40.0	>40.0
40-49	<21.0	21.0 - 24.4	24.5 - 28.9	29.0 - 32.8	32.9 - 36.9	>36.9
50-59	<20.2	20.2 - 22.7	22.8 - 26.9	27.0 - 31.4	31.5 - 35.7	>35.7
60+	<17.5	17.5 - 20.1	20.2 - 24.4	24.5 - 30.2	30.3 - 31.4	>31.4

Figure 2; Zig zag agility run test: source ([www.topened sports.com/](http://www.topened sports.com/)Accessed Thursday August 27, 2020)

### 3.4.1.3 Endurance

VO<sub>2</sub>max stands for maximal oxygen uptake and refers to the amount of oxygen your body is capable of utilizing in one minute. It is a measure of your capacity for aerobic work and can be a predictor of your potential as an endurance athlete. Although there are many factors that affect your VO<sub>2</sub>max, it is a commonly accepted measure of cardio respiratory fitness. Cardiorespiratory endurance is the most vital means of determining a person's maximal oxygen uptake (Vo<sub>2</sub> max) (Mathew, 1981). Maximal oxygen uptake, according to Verducci (1980), indicates how well various physiological functions can be adjusted to increasing metabolic demand of work.

#### Cooper VO<sub>2</sub>max Test

The objective of the Cooper test is to predict an athlete's VO<sub>2</sub>max. The 12 minute run - walk test was used to determine cardiorespiratory endurance. To perform the test, the subjects were given a brief description of the test. They were required to run round 400m track as many times as possible within 12 minutes. The running was done at one's own pace. One could walk or stop when tired. The subjects ran in groups of 12 each. The subjects were asked to run at a constant pace. The research assistants helped to count the number of laps covered by each subject. At the end of 12 minutes, the whistle was blown and all the subjects running/walking immediately stopped. The distance covered during the 12 minutes was the number of laps covered the distance from where each subject stopped from the starting line in meters. The distance each subject covered was used to find out Vo<sub>2</sub> max. The formula for the calculation of Vo<sub>2</sub> max from the running is ml/kg/min. It is measured as "milliliters of oxygen used in one minute per kilogram of body weight." (Wilmore & Costill. 2005)

Required resources

To undertake this test you will require:

400 metre track – marked every 50m

Stop watch

Assistant

How to conduct the test

The test comprises of seeing how far an athlete can run/walk in 12 minutes.

The assistant should record the total distance covered.

Performance assessment

Based on the distance covered an estimate of the athlete’s VO2max can be calculated as follows:

$$\text{VO2max} = (\text{Distance covered in metres} - 504.9) / 44.73$$

Age		Very good	Good	Average	Bad	Very bad
13-14	M	2700+ m	2400 - 2700 m	2200 - 2399 m	2100 - 2199 m	2100- m
	F	2000+ m	1900 - 2000 m	1600 - 1899 m	1500 - 1599 m	1500- m
15-16	M	2800+ m	2500 - 2800 m	2300 - 2499 m	2200 - 2299 m	2200- m
	F	2100+ m	2000 - 2100 m	1700 - 1999 m	1600 - 1699 m	1600- m
17-20	M	3000+ m	2700 - 3000 m	2500 - 2699 m	2300 - 2499 m	2300- m
	F	2300+ m	2100 - 2300 m	1800 - 2099 m	1700 - 1799 m	1700- m
20-29	M	2800+ m	2400 - 2800 m	2200 - 2399 m	1600 - 2199 m	1600- m
	F	2700+ m	2200 - 2700 m	1800 - 2199 m	1500 - 1799 m	1500- m
30-39	M	2700+ m	2300 - 2700 m	1900 - 2299 m	1500 - 1899 m	1500- m
	F	2500+ m	2000 - 2500 m	1700 - 1999 m	1400 - 1699 m	1400- m
40-49	M	2500+ m	2100 - 2500 m	1700 - 2099 m	1400 - 1699 m	1400- m
	F	2300+ m	1900 - 2300 m	1500 - 1899 m	1200 - 1499 m	1200- m
50+	M	2400+ m	2000 - 2400 m	1600 - 1999 m	1300 - 1599 m	1300- m
	F	2200+ m	1700 - 2200 m	1400 - 1699 m	1100 - 1399 m	1100- m

Figure3; Cooper fitness test: source ([www.topened sports.com/](http://www.topenedsports.com/)Accessed Thursday August 27, 2020)

### **3.4.2 Psychological test**

#### Task and Ego Orientation

The Task and Ego Orientation in Sport Questionnaire (TEOSQ) can be used to assess whether an individual defines success in a sporting context as mastery (task orientated) or outperforming others (ego orientated).

#### Questionnaire

TEOSQ is a 13 item questionnaire measuring task orientation (7 questions) and the other ego orientation (6 questions). Before completing the questionnaire, the individual is asked to think of a time when they felt most successful in their sport and answer the questions based on this. The answers are indicated on a 5 point scale, where 1 = strongly agree and 5 = strongly disagree.

#### Target group

This test is suitable for all athletes.

#### Reliability

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

### **3.5 Procedure of Data Collection**

As long as the procedure of data collection was concerned, the researcher was gated through the following steps, so as to collect the relevant data. The first thing she was getting permission from the director/coordinator of the athletics club. The researcher recruited three data collectors of sport professionals, who have strong attachment with the athletics club and gave training on data collection.

### **3.6 Method of Data Analysis**

The data collected through by physical fitness components (speed, agility and endurance) and psychological variables (ego and task orientation) were presented as a group mean value and standard deviations. The data collected with the above mentioned instruments were presented in two forms. The first type of presentation was the discussion of the findings being sometimes supported by theoretical arguments. In order to analyze quantitative data, descriptive statistics such as mean standard deviation, percentage and frequency counts used. In addition to this, inferential statistics such as t test, ANOVA was used to identify differences among groups categorized by institution, class year, and participation group. Regression was performed between the tests of psychological and physical fitness.

## Validity and Reliability

For the pilot tests the researcher followed different procedures in order to increase the correctness of the responses to be obtained from the respondents as per the need of this research study. First, the questionnaires were developed as per the research objectives and research questions. This made the questionnaires to be easy for the respondents. Then, a pilot test was conducted to assess the questionnaire in order to eliminate possible problems created as a result of translation.

### **3.7 Ethical Consideration**

Ethical clearance obtained from Oromia regional sport bureau. The purpose of the study was explained to study participants in order to get informed verbal consent. Then an informed verbal consent was received from each study subjects and anyone who was not be would to take part in the study had the full right to exclude himself/herself. To ensure confidentiality of respondents, their names would not be registered on the questionnaire.



## Chapter Four

### 4. Result and discussion

In this study, there were 52 athletes involved, with in which 31 and 21; male and female athletes, consecutively. The data was gathered in 100% of response rate of Adama athletics project. The athletes average age was 25, 26 & 29; 19.2%, 21.2% & 19.2%, respectively. But the rest 40% is relied from 21-24, 27, 28 and 31 years of age.

#### 4.1 Descriptive statistics

Table 1; Psychological variables of Task and Ego orientation

Variables N=52		SD	D	N	A	SA	total
I am the only one who can do the play or skill	Fre.		5	12	28	7	52
	Per.		9.6	23.1	53.8	13.5	100
I learn a new skill and it makes me want to practice more	Fre.		9	8	14	21	52
	Per.		17.3	15.4	26.9	40.4	100
I can do better than my friends	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
The others cannot do as well as me	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
I learn something that is fun to do	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
Others mess up "and" I do not	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
I learn a new skill by trying hard	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
I work really hard	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
I score the most points/goals/hits, etc	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
Something I learn makes me want to go practise more	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
I am the best	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
A skill I learn really feels right	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100
I do my very best	Fre.		18	12	22		52
	Per.		34.6	23.1	42.3		100

Notice: SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree

Based on the above table 1 found out that, regarding I am the only one who can do the play or skill, measured from disagree, neutral, agree and strongly agree; 5, 12, 28 & 7; 9.6%, 23.1%, 53.8% & 13.5%; respectively. Thus, majority of the athletes have agreed that, they do have a feeling to execute athletics skills.

Concerning I learn a new skill and it makes me want to practice more from disagree, neutral, agree and strongly agree; 9, 8, 14 & 21; 17.3%, 15.4%, 26.9% & 40.4%; respectively. Thus, athletes whom found in the project have good anticipation to learn new skill and internalize the skill. Regarding I can do better than my friends measured from disagree, neutral, agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Thus, athletes have agreed that, they have good spirit to perform than their counterparts. Regarding the others cannot do as well as me measured from disagree, neutral, agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Thus, still have an argument to perform with their friends.

Regarding I learn a new skill by trying hard measured from disagree, neutral, agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Thus, athletes have learning through hard way of training. Regarding I work really hard measured from disagree, neutral, agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Thus, athletes are doing with strong commitment and no refrainment.

Concerning Something I learn makes me want to go practise more measured from disagree, neutral,

agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Thus, the skill that I brought from the camp drives me to work hard. Regarding I am the best measured from disagree, neutral, agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Regarding A skill I learn really feels right measured from disagree, neutral, agree; 18, 12 & 22; 34.6%, 23.1% & 42.3%; respectively. Thus, athletes whom found in the camp feeling sense of self-importance. Regarding

Table 2; Physical fitness results of the Athletics clubs of the male athletes

	Adama				Galan			ORA		Remark
	Type of tests	F	average Sec/min		F	average Sec/min		F	average Sec/min	Middle distance runners
1	Agility	11	17.8		6	18.0		4	16.7	
2	Speed	11	8.9		6	8.6		4	8.6	
3	Endurance	11	3200		6	3100		4	3100	
	Total				21					

Table 3; Physical fitness results of the Athletics clubs of the female athletes

	Adama				Galan			ORA		Remark
	Type of tests	M	average Sec/min		M	average Sec/min		M	average Sec/min	Middle distance runners
1	Agility	10	16.2		9	16.7		12	18.0	
2	Speed	10	8.0		9	8.5		12	8.1	
3	Endurance	10	3500		9	3200		12	3400	
	Total				31					

Table 4; Descriptive statistics for physical fitness

<b>Agility</b>			
Measurement in second	Frequency	Percent	M ± SD
15.9	3	5.8	16.7 ± .73
16.0	6	11.5	
16.2	6	11.5	
16.3	6	11.5	
16.4	6	11.5	
16.5	6	11.5	
16.7	5	9.6	
17.8	10	19.2	
18.0	4	7.7	
Total	52	100.0	
<b>Speed In second</b>			
7.5	7	13.5	8.4 ± .52
8.0	16	30.8	
8.5	8	15.4	

8.6	7	13.5	
9.0	14	26.9	
Total	52	100.0	
<b>Endurance in meter</b>			
3100	7	13.5	3448.08 ± 290.7
3200	13	25.0	
3400	8	15.4	
3500	8	15.4	
3600	8	15.4	
4000	8	15.4	
Total	52	100.0	

As table 2 depicted that, measuring the three physical fitness variables namely, agility, speed and endurance, they were measured in second and meter. In the first instance, the agility of athletes in Adama club were as follows, three individuals were found in 15.9 seconds, these were accounted for by 5.8%. Majority of the athletes, 35 are found between 16-16.7 seconds, these are explained by 67.1% from the total population. 10 athletes are achieved the agility test, within 17.8 seconds, these are 19.2%. The rest four athletes are achieved within 18 seconds; these are 7.7% from the total athletes. The average agility accomplishment was found in 16.7 and the difference between the group was .73 microseconds.

The athletes speed was measured in 60 meter dash, they were aliened in to three various groups. Seven individual athletes were executed the distance within 7.5 seconds and they were explained 13.5% from the total. Thirty one athletes are achieved the distance from 8-8.6 seconds and they are explained by 59.7% from the total. Finally fourteen athletes are completed the distance by nine seconds and they are explained by 26.9% from the total. The average athletes were found in 8.4 second and with the variation of .52 distances.

Endurance of the athletes was found in three different categories, they all are found from 3100-4000 meter of distances. Seven athletes have achieved in 3100 meter and they are explained by 13.5% from the total. Thirteen athletes have achieved by 3200 meter and they explained by 25% from the total. Thirty two athletes are found from 3400-4000 meter and explained by 61.6% from the total population. The average distance covered by athletes were 3448.08 and with the variation of 290.7 meter.

Table 5 Correlation between psychological and physical fitness variables

Fitness variables		task of the trainees	ego of the trainees
		Pearson Correlation	.011
Agility of the players in seconds	Sig. (2-tailed)	.937	.643
	N	52	52
speed of the players in seconds	Pearson Correlation	.062	.078
	Sig. (2-tailed)	.664	.580
	N	52	52
endurance of the players in meter	Pearson Correlation	.035	.036
	Sig. (2-tailed)	.804	.799
	N	52	52

Correlation is significant at the 0.05 level (2-tailed)

The correlation between agility (as measured by zigzag test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a small positive correlation between the two variables [ $r=.011$ ,  $n=52$ ,  $p<.05$ ] with low association between agility and task of the athlete achievement.

The correlation between speed (as measured by 60 meter speed test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a large positive correlation between the two variables [ $r=.062$ ,  $n=52$ ,  $p<.05$ ] with large association between speed and task of the athlete achievement.

The correlation between endurance (as measured by Cooper test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a medium positive correlation between the two variables [ $r=.035$ ,  $n=52$ ,  $p<.05$ ] with medium levels of association between agility and task of the athlete achievement.

The correlation between agility (as measured by zigzag test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a small positive correlation between the two variables [ $r=.066$ ,  $n=52$ ,  $p<.05$ ] with large association between agility and task of the athlete achievement.

The correlation between speed (as measured by 60 meter speed test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a large

positive correlation between the two variables [ $r=.078$ ,  $n=52$ ,  $p<.05$ ] with large association between speed and task of the athlete achievement.

The correlation between endurance (as measured by Cooper test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a medium positive correlation between the two variables [ $r=.036$ ,  $n=52$ ,  $p<.05$ ] with large levels of association between agility and task of the athlete achievement.

## **4.2 Discussion**

Distance events consist of the 800, 1500, and 3000 m, though there is some controversy regarding if the 3000 m should be considered as a distance or middle-distance event. The duration of middle distance events ranges from slightly  $<2$  min to  $\sim 8$  min. Middle distance running performance is an area that has received limited attention in the scientific literature, perhaps due to the variety of factors that are related to performance over this range of distances. Performance in middle distance events is unique in that it is characterized by intermediate factors of biomechanics and physiology, with the challenge being to run at high velocities while still maintaining economical movement. Middle distance events possibly create a realm where different intermediates in terms of biomechanics and physiology may be associated with high-level performance. The relative importance of mechanical power output and energy use likely varies across different middle distance events, as well as over the course of specific middle distance events. For example, power output likely plays a more dominant role in the 800 m than in the 3000 m, and it is suggested that early in the 800 m race mean power output plays a predominant role, whereas energy use is more important later in the race (Kadono et al. 2007).

The correlation between speed (as measured by 60 meter speed test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a large positive correlation between the two variables [ $r=.062$ ,  $n=52$ ,  $p<.05$ ] with large association between speed and task of the athlete achievement. The correlation between speed (as measured by 60 meter speed test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a large positive correlation between the two variables [ $r=.078$ ,  $n=52$ ,  $p<.05$ ] with large association between speed and task of the athlete achievement. The more ego oriented an individual is the most will try to outmatch his/her friends and the most will believe that this effort to outmatch others may lead to success. On the contrary the more task oriented an individual is the most he/she believes that success depends on effort,

interest and pursue of new abilities (Treasure & Roberts, 1995). Most of these studies showed that task orientation is significantly related to positive moral behaviours, while ego orientation appears to be significantly related to unsportsmanlike behaviours (Dunn & Dunn, 1999; Proios, Athanailidis, 2004). In contrast to these findings, there are other studies that claim that task orientation is not significantly related to moral behaviours (Kavussanou, 1997; Stephens & Bredemeier, 1996). Kleiber & Roberts, (1981) Orlick, (1981), by using competitive and non competitive conditions concluded that the behavior of an athlete depends on his/her orientation. Nicholls (1984,1989) stated that ego oriented individuals perceive ability and success from a canonical perspective while task oriented individuals deal mostly with learning and is possible to adopt more inherent motive schemes such is the development of ability and enjoyment (Papaioannou & Theodorakis, 1994).

According to Diggelidis & Krommydas (2008), task and ego are orientations representing opposite views on ability and the definition of success. Task oriented athletes present a pro social behavior and judgment in contrary to ego oriented athletes. These individuals perceive success differently, make less effort to approach it and are affected by outside rewards. The middle distance runner is an athletic hybrid. These runners must possess excellent aerobic capacity, coupled with the power to drive forward for a finishing kick that may be as long as 300 m to 400 m, the point where almost all middle distance races are decided. The middle distances also require the greatest degree of tactical sense and intelligence in the runner, as the decisions that must be made concerning concepts such as front running, pack position, or the timing of an accelerating burst will all be determinative. The absolutely fastest or strongest runner does not always win a middle distance race.

The middle distances place physiological emphasis on a number of factors. The distribution between fast-twitch and slow twitch muscle fibers in an elite middle distance runner is usually close to a 50% pattern, in keeping with the hybrid qualities of these athletes. To utilize this balance, most middle distance training programs combine aerobic and anaerobic training, with the anaerobic aspect often-intense speed training. In the 1980s, the successful middle distance runners of Africa, often athletes from the Rift Valley region, with an altitude of approximately 7,000 ft (2,200 m), pioneered a middle distance training program. In the program, the runners would warm up by running at a relaxed pace (7 minutes per mile) for approximately 4 mi (6.4 km). They would

then

run 40 400-m circuits of the track; each 400 m would be run in less than 60 seconds, with no more than one minute rest permitted between the 400 m intervals. Then the athletes would conclude the workout with another 4-mi run similar to that that began the session.

The focus of the African workout, which is extreme for any runner except those who are highly trained, is the mutual development of anaerobic strength (through the short recovery period), with the aerobic training that is supported by the significant volume of running (10 mi/16 km of high intensity track running, with 8 mi/12.8 km of easier unstructured running). Sprint racing has no particular tactics to be employed; the runners go all out for as long as they can maintain speed. Marathon runners (as well as triathlon and Ironman participants) must employ tactics, but the nature of the event permits such race planning to be made over a relatively long period of time; instantaneous decisions are rare in such races.

Middle distance races are often decided by tactical decisions. In the 800-m race, the runners begin in lanes and they are allowed to get to the inside of the track oval, and thus run the shortest distance possible, after 100 m. The 1 mi/1,500 m begins with all runners behind a gently arcing start line. The runner must make a number of important decisions, each based primarily on the runner's physical attributes. A front running middle distance competitor is one who often tries to wear down the rest of the field with a strong early pace. Racers who possess a well-developed finishing kick will often wait in the pack of runners and attempt to push to the lead over the last 200 m to 300 m. Many athletes will feint a move out of the pack to test the resolve of the other racers. As with any sport that engages a high level of tactical consideration, the successful middle distance runner must spend considerable time developing a resilience and hypercompetitive attitude.



## Chapter Five

### Summary, Conclusion and recommendations

#### 5.1 Summary

This study was to compare some selected physical and psychological measurement with Oromia athletics club middle distance runners.

In this research, the following research questions were addressed:

- What are the athletes' performance of agility, endurance and speed in Oromia athletics club middle distance runners?
- What are the task and ego orientation of psychological performance in Oromia athletics club middle distance runners?
- Do the performance of agility, endurance and speed related to the task and ego orientation of psychological performance in Oromia athletics club middle distance runners?

In this study, there were 52 athletes involved, with in which 31 and 21; male and female athletes, consecutively from the total of 123 athletes in Adama, Gelan and Oromia road authority Athletics club through random sampling technique. The data was gathered in 100% of response rate of Adama athletics project. The athletes average age was 25, 26 & 29; 19.2%, 21.2% & 19.2%, respectively. But the rest 40% is relied from 21-24, 27, 28 and 31 years of age.

Measuring the three physical fitness variables namely, agility, speed and endurance, they were measured in second and meter. The average agility accomplishment is found in 16.7 and the difference between the group is .73 microseconds.

Speed of athletes found in Adama athletics club was measured in 60 meter dash, they were aliened in to three various groups. The average athletes were found in 8.4 second and with the variation of .52 distances.

Endurance of the athletes was found in three different categories, they all are found from 3100-4000 meter of distances. The average distance covered by athletes were 3448.08 and with the variation of 290.7 meter.

The correlation between agility (as measured by zigzag test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a small

positive correlation between the two variables [ $r=.011$ ,  $n=52$ ,  $p<.05$ ] with low association between agility and task of the athlete achievement.

The correlation between speed (as measured by 60 meter speed test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a large positive correlation between the two variables [ $r=.062$ ,  $n=52$ ,  $p<.05$ ] with large association between speed and task of the athlete achievement.

The correlation between endurance (as measured by Cooper test) and task (as measured by task orientation in sport questionnaire) was investigated using Pearson correlation. There was a medium positive correlation between the two variables [ $r=.035$ ,  $n=52$ ,  $p<.05$ ] with medium levels of association between agility and task of the athlete achievement.

The correlation between agility (as measured by zigzag test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a small positive correlation between the two variables [ $r=.066$ ,  $n=52$ ,  $p<.05$ ] with large association between agility and task of the athlete achievement.

The correlation between speed (as measured by 60 meter speed test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a large positive correlation between the two variables [ $r=.078$ ,  $n=52$ ,  $p<.05$ ] with large association between speed and task of the athlete achievement.

The correlation between endurance (as measured by Cooper test) and ego (as measured by ego orientation in sport questionnaire) was investigated using Pearson correlation. There was a medium positive correlation between the two variables [ $r=.036$ ,  $n=52$ ,  $p<.05$ ] with large levels of association between agility and task of the athlete achievement.

## 5.2 Conclusion

Within the limitations of this study, the following conclusions were drawn.

- Measuring the three physical fitness variables namely, agility, speed and endurance, they were measured in second and meter. The average agility accomplishment is found in 16.7 and the difference between the group was .73 microseconds.
- Speed of athletes found in Adama athletics club was measured in 60 meter dash, the average athletes were found in 8.4 second and with the variation of .52 distances.
- Endurance of the athletes was found in three different categories, the average distance covered by athletes were 3448.08 and with the variation of 290.7 meter.
- There was a small positive correlation between agility and task with low association of the athlete achievement.
- There was a large positive correlation between speed and task with large association of the athlete achievement.
- There was a medium positive correlation between endurance and task with medium levels of association of the athlete achievement.
- There was a small positive correlation between agility and ego with large association of the athlete achievement.
- There was a large positive correlation between speed and ego with large association of the athlete achievement.
- There was a medium positive correlation between endurance (as measured by Cooper test) and ego with large levels of association of the athlete achievement.

### **5.3 Recommendation**

On the basis of the findings of this study, the following recommendations are made to compare physical and psychological variables of the middle distance runners for the athletes and also to conduct further research;

- ❖ Ego and task orientation shall be encouraged in athletes for speed component.
- ❖ Training programmes shall be designed that can emphasize more on the dominant physical and psychological characteristics of the athletes.
- ❖ Studies may be conducted to find out the relationship between physical and psychological variables.
- ❖ Findings for this study will add to the existing data in the area of exercise and sports science.
- ❖ Sport officers and professionals shall aware and prepare trainings for trainers about progressive assessment and evaluation of each training sessions to enhance their athletes' performance too.
- ❖ It is necessary to raise awareness among athletes with the importance of psychological training.
- ❖ Further research in the area shall be conducted on other specific fitness components through increasing subjects and adding athletes of other teams.

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**Appendix**  
**JIMMA UNIVERSITY**  
**COLLEGE OF NATURAL SCIENCE**  
**DEPARTMENT OF SPORT**

I. Task and Ego Orientation in Sport Questionnaire

Consider the statement "I feel most successful in sport when..." and read each of the following statements listed below and indicate how much you personally agree with each statement by entering an appropriate score where:

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and  
5 = strongly agree

I feel most successful in sport when...

1. I am the only one who can do the play or skill
2. I learn a new skill and it makes me want to practice more
3. I can do better than my friends
4. The others cannot do as well as me
5. I learn something that is fun to do
6. Others mess up "and" I do not
7. I learn a new skill by trying hard
8. I work really hard
9. I score the most points/goals/hits, etc
10. Something I learn makes me want to go practise more
11. I am the best
12. A skill I learn really feels right
13. I do my very best.

Analysis

The ego orientated questions are questions: 1, 3, 4, 6, 9 and 11

The task orientated questions are questions: 2, 5, 7, 8, 10, 12 and 13

A mean score is calculated by adding all the scores for all the task orientated questions and dividing by 7 and doing the same for the ego orientated questions but dividing by 6.

This gives a mean score between 1 (low) and 5 (high) for each orientation.

### 2.3.4 505 Agility Test

The objective of the 505 agility test is to monitor the athlete's speed and agility with a 180 degree turn.

Required resources



To undertake this test you will require:

4 6 cones

4 Tape measure

4 Non slip surface

4 Stop watch

4 Assistant.

How to conduct the test

The 505 agility test is conducted as follows:

4 Mark out the course as per the diagram above. The distance from A to B is 10m and the distance from B to C is 5m

4 The athlete runs from the start line (A) towards the 10m line (B) (run in distance to build up speed)

4 The assistant starts the stop watch as the athlete passes through the 10m line (B)

4 The athlete runs on to the 15m line (C), turns and runs back towards the start line

4 The assistant stops the stop watch when the athlete passes through the 10m line (B) on their return to the start line

4 The best of two trails is recorded.

Analysis

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

## 2 4 A G I L I T Y

Target group

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

Reliability

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

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### 6.3 4 60 Meter Speed Test

The objective of this test is to monitor the development of the athlete's acceleration and pick up to full flight.

## Required resources

To undertake this test you will require:

4 400m – 60m marked section on the straight

4 Stop watch

4 Assistant.

## How to conduct the test

The test comprises of 3 x 60m runs from a standing start and with a full recovery between each run.

The athlete uses the first 30m to build up to maximum speed and then maintains the speed through to 60m.

The coach should record the time for the athlete to complete 30m and 60m.

## Analysis

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

## Predictions for 100 and 200 meters

The athlete's 100m time can be predicted from their 60m time using the following algorithm:

4  $7.3829894 + ("60m\ Time" \times -0.431975) + ("60m\ Time" \times "60\ Time" \times 0.1394189)$

The athlete's 200m time can be predicted from their 60m time using the following algorithm:

4  $13.795573 + ("60m\ Time" \times -0.720532) + ("60m\ Time" \times "60m\ Time" \times 0.2806044)$

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## Target group

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

## Reliability

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

## On-line calculator

Select the following link to access the on-line calculator

4 60 meter speed test.htm

## 1.12 4 Three Minute Step Test

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

## Required resources

To undertake this test you will require:

4 12 inch step

4 Stop watch (or watch displaying seconds) for timing test and counting recovery heart rate

4 Metronome to set cadence.

How to conduct the test

The test is conducted as follows:

4 The athlete conducts a warm-up

4 Athlete steps up and down at a rate of 24 steps per minute (metronome setting of 96) for 3 minutes

4 Immediately after the 3 minutes of stepping, the subject sits down on the bench and finds pulse (at neck)

4 A 60 second heart rate is taken 5 seconds after completion of stepping

4 This recovery heart rate is the athlete's score.

Analysis

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

Target group

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

Reliability

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

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