CURRENT CONDITION AND FUTURE PROSPECT OF YOUTH ATHLETES: IN ALICHO WURIRO ATHLETICS TRAINING CENTERS

BY

NURU MOHMMED USMAN

A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN SPORT SCIENCE

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Acronyms and Abbreviations

ATDE-	Athletic Talent Development Environment
ATP-	Adenosine Triphosphate
ATP-	Adenosine Triphosphate
BMI-	Body Mass Index
CO2-	Carbon Dioxide
CP-	Creatine phosphate
g/dl-	Gram per Deciliter
L/min-	Liter per Minute
Ml/kg/min-	Milliliter per Kilogram per minute
mlO_2/g hb-	Milliliter of Oxygen per Gram of Hemoglobin
MVV-	Maximal voluntary ventilation
O2-	Oxygen
USA-	United State of America
VO_2max-	Volume of Maximum Oxygen Consumption

Abstract

The main purpose of this study was to examine the current conditions and forecast the future prospect of youth athletes in the athletics training centers established in silte zone southern Ethiopia. The study aimed at addressing the existing problems of coaches to find the best children and youth for track by a multi-factorial modeling in the zone. The study explains the present status of the youth, talent identification process and provides suitable suggestions to improve. This study was conducted on 35 track athletes from athletic training centers found in silte zone southern Ethiopia, comprised of 17 sprinters (100 m 400m), 10 middle distance runners (800 & 1500 m), 8 long distance runners (5,000 & 10,000 m). In terms of methodology, a researcher-made questionnaire was used to collect the data about existing training environment and talent identification from both coaches and trainees. Different field based fitness tests were administered to collect data of the current conditions of track athletics trainees and forecast their future prospect. Anthropometric measurements were taken from the participants of different track events. The results show that 60 meter dash time is of 100 m athletes is below from the recordings so far in the event. Anthropometrical characteristics are as well unsatisfactory compared to the records in the event. The youth in 100 meters also scored poor on the explosive leg power. Male 400 meters youth potential is below the standard set for regional level. The youth identified in middle distance posses a significant potential which can be flourished to world class performance. The youth identified in long distance posses' superior Vo2max value which provided with appropriate training environment will enable the youth to excellence. Moreover, the athletes showed pressure of time, financial hardship, and luck of facility, equipments, and sports suits as challenges. Coach's didactic methodology is also found a problem in the training center.

Key Terms: Talent Detection, Talent Identification, Athletics, Talent Development, Youth Athlete.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The importance of developing and sustaining sporting success is one of the Visions of Ethiopian national strategies for sport. Nothing Left to Chance in sport which us reminds to recognize and nurture sporting talent. To support this vision, particularly in the athletics, different activities have been accomplished by different stake holders in the years before.

The nature-nurture interaction is central to athletic excellence. Is a highly skilled athlete gifted by nature with innate talent or with a certain disposition to sporting performance? Or is exceptional performance a result of countless hours of high quality training? The talent discovery approach is based on the notion that there is an innate reservoir of talent. Using an advanced assessment of the prerequisites for athletic excellence, sporting organizations are able to identify such talent and predict who is likely to excel with the provision of all environmental factors considered to be effective and will take that talent to its potential limit.

Empirical data also supports the importance of creating the 'right' environment and Opportunity; in other words, a change of training methods has been demonstrated to lead to performance increments even in individuals who appear to have plateaued.

All major composers without exception have required at least ten years of concentrated training in order to reach the highest degrees of mastery confirming to us that long periods of preparation and training are equally essential in order to achieve high standards.

Research on expert performance and expertise has also shown that important characteristics of experts' superior performance are acquired through experience and that the effect of practice on performance is larger than believed possible. However, it is not just the time spent practicing that is important; training must be directed at improving or developing a skill. In this regard, the theory of deliberate practice differentiates between activities and purposeful, goal directed work. Deliberate practice requires time, energy, access to teachers, facilities and training materials, and is not inherently enjoyable. Findings indicate that if practice is appropriate, the more time an individual spends practicing the faster they will develop.

For the theory of deliberate practice to be of practical use, more empirical information is needed about the way to practice, rather than about the amount of time to be spent in practice.

In order to be of use, an account of exceptional performance must specify the environmental circumstances, such as the duration and structure of activities, and necessary biological attributes that lead to the acquisition of such characteristics and performance.

In conclusion, talent therefore appears to depend on genetics, environment, opportunity, encouragement, and the effect of these variables on physical and psychological traits. The question is no longer whether genetic or environmental factors determine behaviour, but how they interact. Furthermore, such abilities are not inherited in a simple fashion. It is true that genetic factors are likely to contribute not only to specific abilities, but also to traits such as persistence, the capacity to concentrate and confidence. It also is likely that psychological qualities are indirectly influenced by genetic influences. In other words, psychological factors are affected by an individual's genetic makeup, albeit not in a stable rigid manner. Genetic factors will affect an individual's response to training and tuition, as genetics appear to underpin exposure to nurturing social and physical experiences. However, without the

'correct' environment, namely one in which the individual is encouraged and supported, and has opportunity to learn and practice, optimum performance will never be obtained. It is accepted that certain physiological and anthropometric factors can distinguish between athletes in different sports and this on the 21 century is playing a great role in the modern athletics.

The above scientific review clearly shows the importance of recognizing genetic factors (talent identification) and allowing them the right environment in to which deliberate practice and training will take that talent to high athletic standards. As far as athletics is concerned, scientific investigations in different events of athletics have uncovered all the requirements that are needed to produce high standard performance.

Very recently, with the help of different stake holders including federal government through federal sport commission, regional sport commission and volunteer from private organizations in different parts of Ethiopia opened centers where talent can be developed.

The ultimate goal of the athletics training centers established in different parts of Ethiopia is to produce athletes in different events who will perform and compete at different national and international (continental and world standards) arenas.

It is believed that the youth who joined these centers do posses the physical, anthropometrical and psychological minimum limits required for success in athletics to the respective event they are chosen and being trained.

The ultimate goal of this study was to examine the athletic training centers opened in silte zone, southern Ethiopia. The study mainly focused on the current conditions of the youth being trained in the centers. The study was delimited to only those youth involved in running events currently joined the training centers established in Silte zone southern Ethiopia.

Lastly the researcher recommends for the need to revisit the project in light with the suggested problems.

1.2 Statement of the Problem

Tomorrow's elite athletes are the results of today's youth; the heart of the focus of youth sport development where talent is preserved. This is the reason why different sport organizations all over the world invest on youth. In order to be successful in this regard series attention should be paid which allows preventing waste in terms of monetary resource and the youth being involved in the project. This warns us that the youth that will be in different athletics training centers should at least posses some indicators which as a result of the training and education in the centers will be sharpened to high athletic standards. There are different indicators such as psychological indicators, physiological and physical and anthropometrical indicators which shall be judged objectively. So early identification of future elite performers allows the best youngsters to access to the best coaching and training at an early age, thus increases the likelihood of success. Track and field events are marked by an exceptional variety of duration of a single event, energetic demands and the tempo of energy release. As long as this study is concerned running events do require particular physical and physiological characteristics'. This study therefore examined the youth physical and physiological characteristics'.

Research Questions

The study was targeted mainly to answer the following research questions;

a. What are the ways by which young athletes are selected and allowed to join the training centers where deliberate practice and training is provided?
b. What is the physical and anthropometric characteristics' of youth involved in the running events of the training centers in silte zone?

c. What is the current condition (physiological characteristics) of the youth involved in the running events of training centers in silte zone as a function of field tests?
d. What is the future prospect of the youth involved in the running events of training centers in silte zone?
e. What internal and external environmental factors exist?
f. How is the coaching methodology of the coaches?
g. What is the relationship of the training centers with other stake holders?

1.3 Objectives of the Study

Athletics exceptionally to other sports demands certain physiological, physical and anthropometrical characteristics' which should be judged objectively. These characteristics' can be objectively assessed using different mechanisms. As long as this study is concerned running events from short distance to long distance have their own demands as well. This has then forced different sport organizations particularly in the athletics arena to look for those young with the minimum requirements in different aspects. For this reason training centers and sport academies are becoming very popular these days to reach those young who possess the minimum requirement to high athletic standards through goal oriented deliberate practice and training.

1.3.1 General Objective of the Study

The general objective of this study is to examine current condition and forecast the future prospect of youth involved in running events in the athletics training centers opened in silte zone southern Ethiopia.

1.3.2 Specific Objectives of the Study

- ✓ asses the ways by which young athletes are selected and allowed to join the athletics training centers

- ✓ asses the physical and anthropometrical characteristics of youth involved in the running events of athletics training centers
- ✓ asses the current physiological condition of youth involved in the running events of athletics training centers as a function of field tests
- ✓ assess the coaching methodology of the coaches
- ✓ assess internal and external factors and suggest recommendations on the basis of the evidence

1.4. Significance of Study

This study will have high importance for various reasons. First it shows the current physical, anthropometrical physiological condition and gives future prospect of the youth currently train in the athletic training centers opened in silte zone. Beside this study will be significant as it examine current condition and forecast the future prospect of youth involved in running events in the athletics training centers opened in silte zone southern Ethiopia. The research also comes up with recommendations that can be used by other athletics clubs to strengthening their organizational and operational structures so as to enhance their athlete's performance and achievements. And lastly this study will initiate other researchers to conduct further studies.

1.5 Delimitation of the Study

This study mainly is focused on the assessment of current physical, anthropometrical physiological condition and gives future prospect of the youth currently working in the athletic training centers opened in silte zone. The scope of this study is therefore delimited to the athletics training centers established in southern Ethiopia silte zone. There are two athletics training centers opened in the zone; one by the help of the federal sports commissions the other one by the help of the regional sport commission. One of the athletics training centers named Alicho Wuriro regional project is located in Alicho wereda where as the second one Alicho Wuriro federal project is also located in

Alicho wereda. A total of 29 youth athletes were attending in the regional project center where as 17 youth athletes in the federal project center. All the youth attending both centers are focused on the running events.

1.6 Limitations of the Study

- ✓ The study did not control the underlying variables such as injuries, sickness or tiredness.
- ✓ The study did not control the subject's dietary and health behavior
- ✓ Budget was the leading constraint which forced the study to be only focused on running events in Alicho Wereda
- ✓ The trainees leaved with their families and are forced to travel some distances on foot before and after practice sessions

1.7. Definition of Terms

Anthropometric measurement: Defined as the measurements of the dimensions of the human body and include among others, measurements of height, weight and body composition.

Athletics: sports such as running jumping, throwing etc.

Field: an area of land used for sports such as jumping and throwing.

Physiological: Defined in this study as the outcome of measurements of components such as anaerobic and aerobic endurance, strength, and flexibility.

Prospect: expectations of success.

Talent detection: Discovery of potential performers who are not currently involved in the sport in question

Talent development: providing athletes with a suitable learning environment so that talent can be realized.

Talent identification: process of recognizing current participants with the potential to become elite players".

Track: race course, running track.

Young athlete: refers children specifically who are successful in school, club teams, local, national and or international age-grouped competition

1.8. Organization of the thesis

This thesis consists of five chapters. The first chapter deals with the back ground, statement of the problem, research questions, objectives, significant of the study and scope and limitations and organization of the study. Chapter two reviews literature related to the research topic. Methodological issues including description of the study area are presented in the third chapter. The fourth chapter presents the results of the study and their interpretation. The final chapter summarizes, concludes and presents recommendations.

CHAPTER TWO

LITERATURE REVIEW

The focus of this study is to examine the current condition of the youth athletes and their future prospects in the ALICHO WORIRO athletics training centers. The study examines the existing condition of the training center, the talent identification mechanism in practice, the coaching methodology of the coaches working with the youth, the physical and physiological characteristics and the motor behaviors.

This chapter discusses about the pertinent literature regarding the talent identification and development in track events of athletics, the physiological, physical and psychological make up required for track events.

2.1 Talent Identification and Development

2.1.1 Talent Detection and Selection

The talent discovery approach is based on the notion that there is an innate reservoir of talent. Using an advanced assessment of the prerequisites for athletic excellence, sporting organizations are able to identify such talent and predict who is likely to excel. The following properties notes to the composition of innate talent;

(1) Talent originates in genetically transmitted structures and hence is at least partly innate.
(2) Its full effects may not be evident at an early stage, but there will be some advance indications, allowing trained people to identify the presence of talent before exceptional levels of mature performance have been demonstrated.
(3) These early indications of talent provide a basis for predicting who is likely to excel.

(4) Only a minority is talented, for if all children were, there would be no way to predict or explain differential success. Finally,
(5) Talents are relatively domain-specific.

This talent discovery approach advocates the systematic detection of talent as an essential part of elite sport programs (Henriksen, 2010). He point out the following advantages of systematic talent detection and selection: Improved motivation derived from recognition of a special talent; less likelihood of specialization in "the wrong sport"; and better financial support for truly talented athletes once those without the right preconditions have been eliminated, which all results in a more efficient use of resources.

It has been suggested that there should be a differentiation between talent as raw material and as end product. In consequence of this distinction, and with an eye to soccer, Williams and Reilly (2000) defined *talent detection* as the discovery of potential performers not yet involved in the sport, and *talent identification* as the recognition of current participants with the potential to become elite players. These definitions have the potential to clarify the field, but they have not been widely implemented within talent research in sport (Henriksen, 2010).

Mapping early indications that could potentially predict later success, all the models in talent development highlighted influences such as anthropometry (e.g. body size and composition), physiology (e.g. muscle fiber composition) and fundamental motor skill, but varied in the relative importance they attributed to psychological factors. It has been suggested that psychological factors are of primary importance in determining whether an athlete reaches and stays at a high level (Henriksen, 2010).

Research has shown that elite athletes possess significantly higher levels of mental skills than do less elite athletes. The development and maintenance of psychological skills is obviously important for the evolution of talent. It is

noteworthy that commitment and self-confidence have consistently been associated with high level performance. Henriksen, 2010 mentioned psychological skills such as goal setting, realistic performance evaluation, imagery and commitment as factors that may potentially distinguish between successful and less successful elite level athletes.

2.1.2 Problems and Limitations Regarding Talent Detection and Selection

Systematic attempts to select athletes based on identification of their special talent are subject to criticism for a number of reasons. The overall problem is simply that talent is so complex a construct that it is not easily defined nor measured.

As a consequence of the multidimensionality of athletic talent, some athletes who score low in certain areas are able to compensate with high scores in other areas and reach the international elite level in spite of seemingly bad odds, as in the case of a short basketball player or a tall wrestler. This makes assessing the relevant areas in relation to each other a virtually impossible task and compounds the risk of selecting or de-selecting the wrong athletes.

A number of factors unrelated to talent seem to play a significant role in determining the likelihood that a young athlete will make a successful transition to elite sport. One such factor is age. The relative age effect highlights birth date as a predictor of athletic success, with athletes born in the beginning of a selection year being more likely to make it to the senior elite level than athletes born late within the selection year because older athletes in a group are likely to be bigger, stronger and faster. This means that they are (1) more often selected for special training and put in decision-making roles, which gives them more time on task, and (2) more often reinforced by coaches, team mates or others in the sense that they achieve success and their success brings congratulation and added confidence. Although likely to be outbalanced during

maturation, physical maturity seems to play a role in the selection processes and to define who has access to superior training conditions [Ibid].

2.2 Athletic Talent Development Environment

In studying child development, an ecological systems theory depicts the environment as a series of nested structures. The micro-system is made up of relations in which the person spends a good deal of time, such as home or school; the meso-system consists of the interrelations between different micro-systems; the exo-system is formed by contexts in which the individual is not actually situated but which have direct influence on development, such as the parents" work place; and the macro-system made up of larger cultural patterns of the society. Bronfenbrenner"s use of the word ecology refers to the interrelatedness between the individual and his context (Henriksen, 2010). The ecology of child development stressed how development is affected by the complex interrelationship between process, person, context and time.

As the primary mechanism of human development, the process refers to proximal processes that are interactions between the individual and the context (objects, symbols and people on the micro-, meso-, exo- and macro-level) over an extended period of time. The person refers to the dispositions and resources of the developing person and the way in which this person invites or discourages reactions from the social context. Context refers to the four levels of the environment (micro-, meso-, exo-, and macro-levels) and includes both objective properties of the context and the way in which the context is perceived by the person. Finally, time includes micro-time (what happens during an activity) and macro-time (the importance of historic events or periods). The model acknowledges that the person affects as well is affected by the context. Thus, Bronfenbrenner definesthe ecology of human development as:

> *" ... The scientific study of the progressive, mutual accommodation, throughout the life course, between an active, growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by the relations between these settings, and by the larger context in which the settings are embedded." (Cited in Henriksen, 2010, p. 34,)*

Aspects of the development of sports talent are linked to all components of Bronfenbrenner's bioecological model on a general semantic level which includes, but is not restricted to, the settings in which the talented athletes are active. Environments evolve and cannot be examined without a reference to the time frame. As a final feature adopted from ecological psychology, proximal processes of daily life such as training and competitions are seen as the engine of development. The systems theory framework view athletic talent development environments as systems with certain functions and components, with a structure and a development, in other words as organized wholes that are self-regulating in terms of maintaining a fit with the context and maintaining stability (Henriksen2010).

Athletic talent development environments' are always nested in a broader societal and cultural sphere that cannot be neglected. The phenomenon of culture is not restricted to a broader societal level but also relevant in small groups. This element was incorporated into the working models by using the concept of an organizational culture that defines central values, directs behavior and guides the socialization of new members.

2.2.1 Athletic Talent Development Environment (ATDE) Model: A Descriptive Working Model

Figure 1 presents the ATDE working model as a framework for describing a particular athletic environment and for clarifying the roles and functions of the different components and relations within the environment in the talent development process.

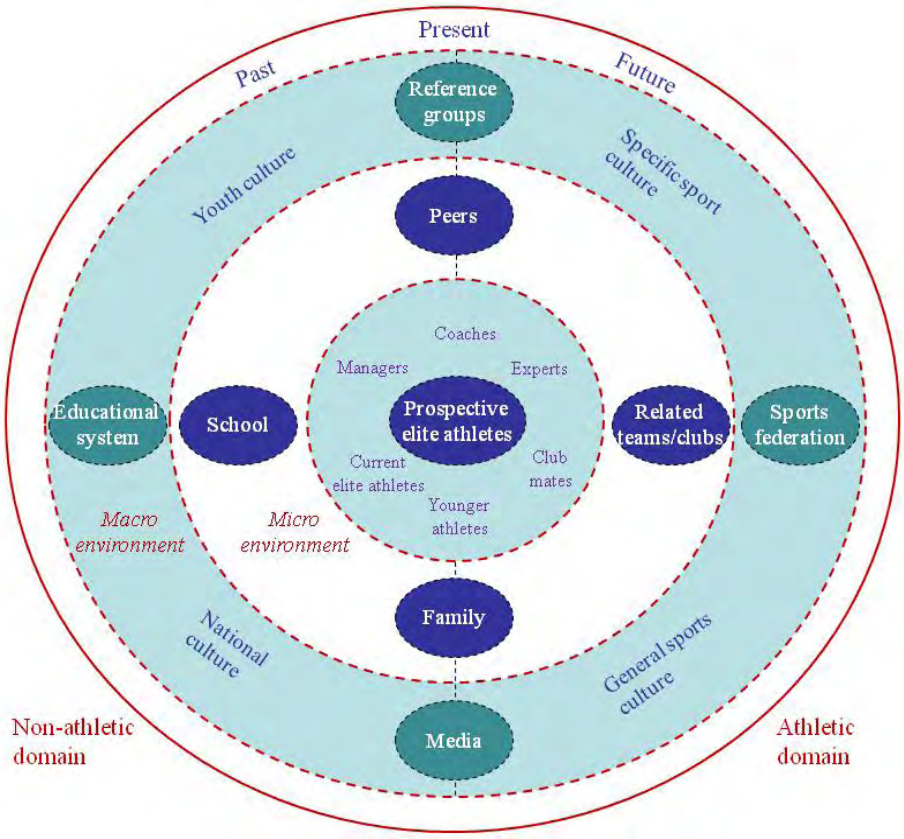

Figure 1: Athletic Talent Development Environment (ATDE) working model taken from Henriksen 2010, p. 40

The environment is viewed as a system with functions, a structure and components. The main function of an ATDE as a system is to help promising young athletes make a successful transition from junior to top-level senior sports. The young prospective elite athletes, therefore, appear at the centre of the model. Other components of the ATDE are structured into two levels (micro and macro) and two domains (athletic and non-athletic). The micro-level refers to the environment where the prospective elite athletes spend a good deal of their daily life and is thus characterized by real communication and interactions. The macro-level refers both to social settings, which affect but do not contain the athletes, and to the values and customs of the cultures to which the athletes belong. The athletic domain covers the part of the athletes"

environment that is directly related to sport, whereas the non-athletic domain presents all the other spheres of the athletes" lives.

At the micro-level directly surrounding the young athletes is the club environment. The club environment typically involves managers, coaches and experts such as sports psychologists, sports physiologists, nutrition experts and physiotherapists. It also often includes younger athletes and elite senior athletes, who may serve as role models. Beyond the club environment, the micro-level includes school, family, peers and also related teams and clubs, who may be perceived as opponents or opportunities for enriching interactions.

2.3 Requirements of Athletic Excellence in Track Events

Specific anthropometric characteristics are needed to be successful in certain sporting events. It is also important to note that there are some differences in body structure and composition of sports persons involved in individual and team sports. The tasks in some events, such as shot put or high jump, are quite specific and different from each other and so are the successful physiques. This process whereby the physical demands of a sport lead to selection of body types best suited to that sport is known as “morphological optimization” Abraham, 2010 . Track and field events are marked by an exceptional variety of duration of a single event, energetic demands and the tempo of energy release. The fact that runners need to carry their body weight, which means they need to overcome the force of gravity on different distances, stipulates a specific (lean) body composition as a prerequisite for more efficient and economic performance in a single event. Athletes who have (or) acquired the optimal physique for a particular event are more likely to succeed than those who lack the general characteristics. Studies on somatotype of athletes, elite athletes and Olympic athletes have generally shown that strength and speed dependent athletes tended to be basically mesomorphic while distance

dependant athletes were found to be more ectomorphic with limited amount of mesomorphic muscularity (Abraham, 2010).

In running at any sub maximal speed, the oxygen requirement is increased with any increment in body weight that is, oxygen consumption is increased due to the greater energy demand required to initiate and sustain movement of a larger weight. Previous research has demonstrated that athletes in all running events have less body fat compared to most other disciplines.

2.3.1 Physical and Physiological Characteristics of Sprinting

The word 'sprinting' is used in modern sport to describe behavior as different as a runner racing flat-out over the last 150 m of a 10 000 m race, a tennis player running flat-out to return a drop-shot at the end of the fifth set of a tennis match, a schoolboy or girl running 100 m in the school sports, and a rugby forward running short bursts of 10–15 m as part of his or her training. Used in this way, the word 'sprinting' is a relative expression conveying the sense that someone is trying to run as fast as possible in the circumstances, even though the circumstances may not always be favorable to running at great speed, nor the performer particularly suited to the activity.

This use of the word 'sprinting' to convey the relative intensity of effort in running is unsatisfactory from the sports scientist's point of view. Many of the factors that tend to limit the performance of a 10 000 m runner who attempts to 'sprint' after nearly half an hour of continuous exercise, or a tennis player who attempts to 'sprint' after two to three hours of intermittent work, are quite different from the factors that operate when an elite sprinter comes fresh to the start of a 100 m race.

To make matters even more confusing, the word 'sprinting' is commonly used to describe fast and relatively short efforts in a whole range of other activities including swimming, skating, and cycling, in which the relative intensity and duration of the activity varies considerably.

For the purpose of this study it will be necessary to focus specifically on one particular form of sprinting and I have selected the widely known 'pure' version of sprinting—running a 100 m race in a track and field competition and the sprinters (male and female) who excel at it.

Short and high intensive athletic events (sprints) require high anaerobic capacity. Anaerobic work capacity which requires highly power full and efficient muscle contraction for a short time is the main factor of fitness index for maximum strength and competitive athletic. An athlete's capability to cover a distance in a short period of time is a factor of power and explosive strength of the muscle. Power refers to the ability of the neuromuscular system to produce the greatest possible impulse in a given period of time. The time period depends on the resistance or load against which the athlete has to work and the organization of the acceleration. Explosive strength on the other describes the ability of the neuromuscular system to develop a high action velocity.

As far as this research is concerned, explosive strength or power is the physiological requirement for sprint events of 100 meters, 200 meters and 400meters. There are different ways of measuring the anaerobic power of athletes. One approach is to describe changes in chemical substances either used in alactic or lactic anaerobic metabolism and the other approach determines work performed or power generated during short duration high intensive activity Abraham, 2010).

Vertical Jump Norm Table

The table below categorizes the vertical jump height in centimeters and inches for adult men and women. This ranking scale is based on my observations, and will give a general idea of what is a good score.

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

http://www.topendsports.com/testing/etid.htm

Sprinters are shown to be mesomorphic in their somatotype. Speed is also the distinguishing physiological predictor in sprints. Speed, according to different authors, is a genetically predetermined physiological attribute which training does only bring it to the physiological limit. Speed is the result of anaerobic capacity combined with explosiveness.

Sprint or speed tests can be performed over varying distances, depending on the factors being tested and the relevance to the sport. The 60 Meter Sprint is part of the Talent Identification Testing Program for Track and Field.

Anthropometrical Characteristics of Sprinters

In their anthropometrical qualities, sprinters are assumed to be long in height in general and the length of the extremities' are also assumed to be longer. The longer the athlete the longer the stride length hence along with frequency enables the athlete to achieve high running velocity.

Male Sprinters Anthropometric

Sprinters come in a remarkable range of shapes and sizes. Elite male sprinters have ranged in height from 1.57 m to 1.90 m and in weight from 63.4 kg to 90 kg (Reilly, Secher and Snell 2005). They are on average the heaviest of all runners, but not the tallest and the majorities are significantly mesomorphic, and in relation to their skeletal dimensions they tend to be more heavily muscled than runners in other events.

It is concluded that elite male sprinters were naturally endowed with large muscles, rather than having developed them by training. A large muscle mass may confer some advantages at the start of the race and in the early stages of acceleration, as the larger the cross-sectional area of a muscle the greater the forces it can develop.

Before the body has developed any great forward velocity, absolute muscular strength can play its largest part. It is probably for this reason that the more heavily muscled sprinters do well at this stage: later in the race having the right type of muscles and the necessary skill and neuromuscular organization may be more important than muscle size.

In running 100 m the elite males take between 44 and 53 strides at a rate from 4.23 to 5.05 strides per second, with the sprinters having the longest legs producing the greatest stride lengths and the slowest striding rates compared with other elite male sprinters. In the Second World Athletics Championships in Rome in 1987, the eight finalists in the 100 m had a mean of 45.69 strides at a mean rate of 4.59 strides s−1 (Reilly, Secher and Snell 2005). If a sprinter's

legs are above an optimal length he will find it increasingly difficult to produce the rapid leg cadence that seems to be a prerequisite for good sprinting.

Female Sprinters Anthropometric

Female sprinters typically range in height from 1.57 m to 1.78 m, and in weight from 51.0 kg to 71.0 kg (Reilly, Secher and Snell 2005). They too, like the males, are the heaviest runners, but not the tallest.

In running 100 m, however, they use their physical resources quite differently from the males. Like the males, the females too take between 44 and 53 strides to run 100 m, and their typical rate of striding from 4.0 to nearly 5.0 strides s–1 is also very similar to their male counterparts. In the 1987 World Championships in Rome, the finalists averaged 49.35 strides which was 8% more than the males, but their mean rate of striding was 4.54 strides s−1 which was very similar to the males. As the leg length and standing height of elite female sprinters is less than their male counterparts, it is not surprising that their maximum stride length is shorter: 2.05–2.30 m compared with 2.17–2.40 m for the males.

It is, however, sometimes misleading to talk of mean values for stride rate and stride length, for each sprinter runs the race with his/her own unique blend. There are, however, some interesting overall differences between males and females. In particular it should be noted that in comparison with males of the same leg length the female elite sprinters run with a markedly slower striding rate. Nevertheless the same general trend exists as for the males: the tallest sprinters run with the longest strides and the slowest rates, and the shortest run with shorter strides and the faster rates of striding.

Although being tall may have disadvantages for sprinters, it may provide some advantages as well. A taller runner's longer limbs will enable longer step length (Winter, 1990) cited in Uth, 2005, which could be advantageous since running speed is a function of step frequency and step length. Accordingly, one may

expect a smaller stature to be a disadvantage in sprint running. In sprint running, one may therefore expect a smaller proportion of world-class sprinters to be short in stature compared to the normal population (Uth, 2005).

Table 1. Characteristics of male world-class sprinters, young American and Danish normal populatio

		Sprinters	USA	DK	Statistical Difference ($p < 0.05$)
Height (m)	mean	1.80	1.77	1.82	USA < Sprinters = DK
	SD	.06	.08	.07	Sprinters < DK < USA
Body mass (kg)	mean	77.0	83.4	79.8	Sprinters = DK < USA
	SD	6.6	19	13	Sprinters < DK < USA
BMI ($kg \cdot m^{-2}$)	Mean	23.7	26.6	24.1	Sprinters = DK < USA
	SD	1.5	5.2	3.4	Sprinters < DK < USA

USA = American normal population, DK = Danish normal population.

Table 2. Characteristics of female world-class sprinters, young American and Danish non-athletes.

		Sprinters	USA	DK	Statistical Difference ($p < 0.05$)
Height (m)	Mean	1.68	1.63	1.69	USA < Sprinters = DK
	SD	.07	.08	.07	DK = Sprinters = USA
Body mass (kg)	Mean	58.1	66.2	71.1	Sprinters < DK < USA
	SD	5.2	23	12	Sprinters < DK < USA
BMI ($kg \cdot m^{-2}$)	Mean	20.4	26.7	23.1	Sprinters < DK < USA
	SD	1.4	6.7	4.0	Sprinters < DK < USA

USA = American normal population, DK = Danish normal population.

Muscle

It becomes clear that most of 100 m sprinters, that their special talents revolve around their ability to produce very large forces very rapidly.

In the average human vastus lateralis muscle, men have been found on average to be slightly below, and women slightly above, 50% Type II fibers (Reilly, Secher and Snell 2005).

Finding a large percentage of Type II fibers in sprinters' muscles should not come as a surprise for their presence confers both metabolic and mechanical advantages for running 100 meters. In the first 2–3 s of the sprint race,

muscles increase their rate of fuel utilization one thousand fold (Reilly, Secher and Snell 2005) and power output and ATP turnover reaches its peak.

Metabolically, Type II fibres are well equipped for the rapid production of energy, possessing a high level of stored energy in the form of creatine phosphate, and the ability to rapidly convert muscle glycogen to lactic acid and so generate the ATP required for muscle contraction. Mechanically, these fibers can deliver very considerable forces in a very short period of time, possessing as they do much shorter contraction times than Type I fibers and the capability of producing much greater maximum tension.

The main contractile difference between Type II and Type I fibers, however, is in the differences in the rates of hydrolysis of the myosin ATPase, but the maximum tension that a muscle fiber can achieve is a function of the number of actin and myosin filaments and the number of cross-bridges formed, regardless of the ATPase activity. There are, however, disadvantages: Type II fibers rapidly become fatigued and many of these fibers tend to remain un-recruited in all but the most intensive efforts. Type II fibers come in two main subtypes; and sprinters possess not only more of the Type IIb, which is the classic 'sprint' type, easily fatigued but capable of high tension and short contraction time, and which are recruited in rapid and powerful movements; they also possess an unusually large number of Type IIa fibers. These, although of the FT (fast twitch) type, are reddish in colour and have better endurance capabilities than the other Type II fibers. Reilly, Secher and Snell (2005) found nearly 28%Type IIb fibers and nearly 40% IIa in their best sprinters. The presence of Type II fibers is important at the start, during acceleration and at top speed. It is now a familiar and predictable observation that elite male sprinters have a greater percentage of Type II fibers and that these fibers represent a greater cross-sectional area than for non-elite males. Further it is now usual to relate a sprinter's success to the presence of these fibers with their characteristics of high force generation and relatively rapid

fatigability (Reilly, Secher and Snell 2005). It should be pointed out, however, that these observations are based on male sprinters; data demonstrating the same relationship between Type II fibres and the mechanical and metabolic characteristics of female sprinters are lacking. Gender differences are not well explored for sprinting, but evidence is growing for other populations that the interrelationships between fiber type, muscle elasticity, fatigue, muscular power and running speed are not the same for females as for males.

2.3.2 Neuromuscular Organization

For sprinters to be successful they must have the right sort of muscles, but they must also have the right sort of nervous system to drive them. Discussion of muscle fiber types of sprinters tends to draw attention away from the fact that muscle fibers are only part of an individual motor unit that consists of the motor nerve cell in the spinal cord, the motor nerve fiber to the muscle, the end-plate or junction between the nerve fiber and the muscle, and the colony of muscle fibers innervated by the motor nerve.

The large forces produced by the sprinters are not merely the result of the mechanics or bioenergetics of contraction; they are also the result of the number, size, and speed of the motor units recruited, the synchrony of their firing and their excitability (Reilly, Secher and Snell 2005).

Elite sprinters seem to have central nervous systems that are particularly suited to making fast, alternating movements, even when insignificant forces are involved. There is ample evidence that they can run with faster striding rates than others (Reilly, Secher and Snell 2005), but they can also alternate their legs unusually rapidly even when running on the spot, and they can also alternate each of their hands and feet in simple tapping tasks faster than controls). These are all indications that elite sprinters are well 'organized' neurologically and that they possess better co-ordination that controls for rapid, alternating tasks. This of course makes them particularly suited to running

races in which arms and legs are required to alternate 4.5–5.0 times per second.

2.4 Physical and Physiological Characteristics of Middle Distance Running

Traditionally, events involving primarily speed (100, 200, and 400 meters) were classed as 'sprints', those from 5000 meters and up were referred to as 'distance' races and events in between (800 and 1500 meters) were known as 'middle distance'. Thus the somewhat arbitrary classification distinguished events that required mainly speed, endurance or a combination of the two. The 800 meters is an event that is within the scope of a long sprinter (400 meters), whereas an endurance runner with some speed may be successful at 1500 meters. This suggest that the physiology of middle distance running has some aspects common to the physiology of shorter and longer events, but possesses its own unique features.

2.4.1 Physiological Characteristics of Middle Distance Running

A characteristic of middle distance running is that the energy demands for muscle contraction are considerably higher than the capacity of the athlete to provide using aerobic metabolism; thus there is a strong anaerobic component in particular in the 800 and 1500 meters events.

Middle-distance running is a relatively complex event, drawing on both aerobic resources and anaerobic reserves.

As it is extremely difficult to train both of these metabolic pathways simultaneously, the importance of scientific assessments as part of training prescription cannot be understated.

In addition to assessments and development of these two capacities, tests that evaluate body composition and muscular function may reveal a competitive advantage, which could be used to contribute to ultimate success.

In events lasting up to about 30 s, adenosine triphosphate (ATP), the immediate fuel for muscle contraction, is provided anaerobically by high-energy stores of creatine phosphate (CP) present in muscle, and by the glycolytic breakdown of glycogen to lactic acid. From 50 s and longer, there is a rapid increase in the reliance on ATP production by aerobic metabolism. These energy sources have finite limits and accordingly govern the level of exertion possible for a particular time span.

The energy required for running speeds of up to about 75% of maximum oxygen uptake (V O_{2max}) is produced primarily by the complete oxidation of glucose (from muscle and liver glycogen) and to a lesser extent fatty acids from both intramuscular stores and mobilized in the blood from extra-muscular stores (Reilly, Secher and Snell 2005).

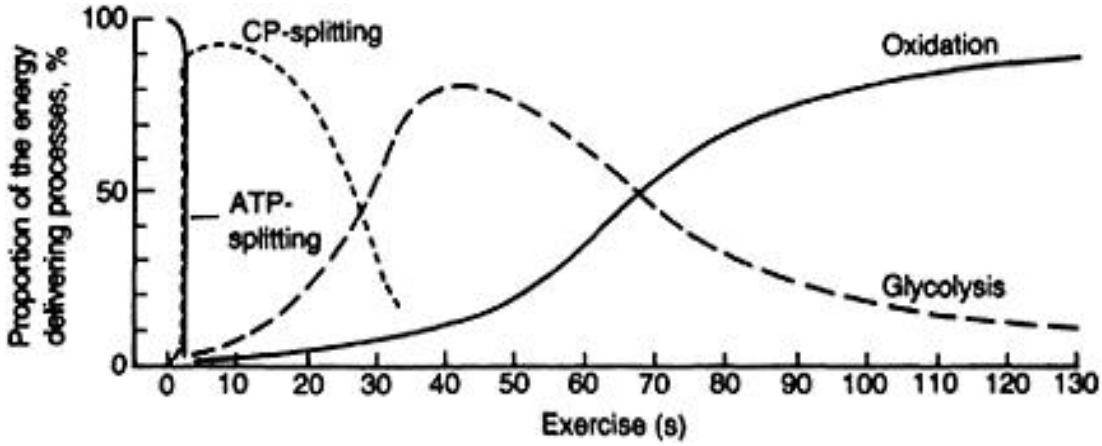

Figure 2: Schematic representation of the contribution of energy sources during maximal runs of different duration (Reilly, Secher and Snell 2005)

From a physiological perspective, it is clear that the shorter middle-distance events have large anaerobic and aerobic contributions (especially the 800m and 1500m), but as the distance and duration of the events increase, the aerobic component becomes dominant. For this reason, it may be erroneous to regard the 10 000m as a middle-distance event, due to the large aerobic component required for success, despite the high running velocity which must involve significant anaerobic energy.

The recent trend in physiological assessment has been primarily in the areas of anaerobic performance, muscular function (particularly isokinetic strength and dynamic function) and biomechanical aspects (such as stride length and the effect of body mass), where a number of investigators have all utilized middle-distance runners in experimental samples (V. Heerden, 2005). Approximately 40% of the total energy used during an 800 meter run, and up to 65% during a 1500 meter run is provided by aerobic metabolism (Astrand et al, 2003) cited in V. Heerden, 2005. It is clear that although anaerobic energy is required, aerobic capacity is also a determinant of success in middle-distance events (Brandon, 1995) cited in V. Heerden, 2005.

Both long- and middle-distance runners are known to possess higher levels of aerobic function, although there is some variation in middle-distance runners. Long-distance runners need to provide energy for prolonged periods of time, and are typically able to operate at an intensity corresponding to a level of approximately 75 – 90% of VO_{2max} for over two hours (Daniels, 1985; Brandon, 199n) cited in V. Heerdem, 2005. Middle-distance runners, however, are able to sustain intensities corresponding to above 110% of the velocity of VO_{2max}, but only for periods of approximately 10 minutes (Daniels, 1985; Brandon, 1995) cited in V. Heerden, 2005.

The term aerobic power is synonymous with VO_{2max} and defines the maximal amount of oxygen that the runner can utilize during a short (5–10 min) effort to exhaustion on a treadmill. Its value, which has a strong genetic component,

appears to be determined by central circulatory capacity, in particular the pumping capacity of the heart. An athlete's O_{2max} is important because theoretically it sets the upper limit of endurance performance. However, among those with values above 70 ml kg^{-1} min^{-1}, local muscle adaptations appear to be the key factor in performance.

Aerobic metabolism which provides approximately 40 to 66% of the energy requirement during an 800m run only provides energy during the latter stages of the run. The initial energy requirement, in addition to the remainder, must be met by other forms of energy production, which consequently induce excess lactate production, V. Heerden, 2005. As stated previously, a large amount of the energy required for middle-distance running is derived from aerobic sources, but the balance (35 – 60%) needs to be made up from anaerobic energy, V. Heerden, 2005.

Contributions from the two energy systems occur simultaneously, although the dominant energy source early in the run will be primarily anaerobic. After a period of approximately 45 seconds, aerobic energy begins to be utilized to a greater extent, as oxygen consumption starts to reach maximal values (Brandon, 1995; Snell, 1990) cited in V. Heerden, 2005.

The initial anaerobic energy sources for events of this intensity are stored phosphor-creatine, ATP and oxygen attached to myoglobin. Anaerobic glycolysis (with the concomitant production of lactate) is an essential subsequent metabolic pathway for energy production in middle-distance running, as metabolic stores only account for about 20kJ of available energy. The ability to tolerate elevated blood lactate concentration is therefore an important contributor to performance, as is the efficient removal and resynthesis of the by-products of anaerobic metabolism (Astrand et al, 2003; Maffulli, 1991a) cited in V. Heeerden, 2005.

The early work on fiber type indicates that middle distance runners have an even distribution of fast and slow twitch muscle fibers. The metabolic properties of these fibers as revealed by the activity of oxidative and glycolytic enzymes reflect the emphasis placed by these runners on training intensity (Reilly, Secher and Snell 2005).

2.4.2 Physical Characteristics of Middle Distance Running

Anthropometrical measurements of elite male middle-distance athletes have yielded that the ideal body type or physique should be a combination of moderate height, light weight and low body fat. This should provide an athlete with a mechanical advantage in these high-intensity running events. Their somatotypes characteristics should yield either dominant ectomorphic or mesomorphic characteristics. Proportionality data indicates the importance of long limbs and shorter trunk for these events, (Carter, 1982c, 1984; Ross et al, 1984; Tanner, 1964), cited in V. Heerden, 2005.

Various anthropometric studies on Olympic athletes have shown that the combination of moderate height, light weight and low body fat is the predominant feature of middle distance runners. There is some variability in height, and in shorter events, particularly 400 m, there is a tendency towards greater mesomorphy.

2.5 Physical and Physiological Characteristics of Long Distance Running

Long distance running relies on the efficiency of the cardio respiratory system to efficiently consume oxygen for prolonged period. VO2 max is the maximum volume of oxygen that by the body can consume during intense, whole-body exercise, while breathing air at sea level (Sieler, 2000). This volume is expressed as a rate, either liters per minute (L/min) or milliliters per kg

bodyweight per minute (ml/kg/min). Because oxygen consumption is linearly related to energy expenditure, when we measure oxygen consumption, we are indirectly measuring an individual's maximal capacity to do work aerobically.

Every cell consumes oxygen in order to convert food energy to usable ATP for cellular work. However, it is muscle that has the greatest range in oxygen consumption. At rest, muscle uses little energy. However, muscle cells that are contracting have high demands for ATP. So it follows that they will consume more oxygen during exercise. The sum total of billions of cells throughout the body consuming oxygen, and generating carbon dioxide, can be measured at the breath using a combination of ventilation volume measuring. The figure below (fig 2.1) summarizes this process of moving O2 to the muscle and delivering CO2 back to the lungs.

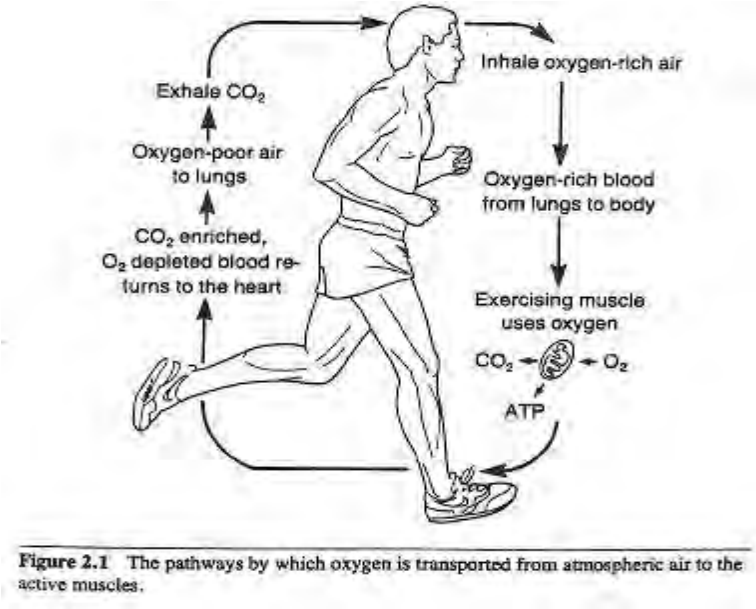

Figure 2.1 The pathways by which oxygen is transported from atmospheric air to the active muscles.

Figure 3: the pathways by which oxygen is transported from atmospheric air the active muscle

Stephen Seiler, *EXERCISE PHYSIOLOGY,* the Methods and Mechanisms Underlying Performance (sections 1-2)

So, if we measure a greater consumption of oxygen during exercise, we know that the working muscle is working at a higher intensity. To receive this oxygen and use it to make ATP for muscle contraction, our muscle fibers are absolutely dependent on 2 things: 1) an external delivery system to bring oxygen from the atmosphere to the working muscle cells, and 2) mitochondria to carry out the process of aerobic energy transfer.

Endurance athletes are characterized by both a very good cardiovascular system, and well developed oxidative capacity in their skeletal muscles. Endurance athletes need efficient pump to deliver oxygen rich blood to the muscles, mitochondria-rich muscles to use the oxygen and support high rates of exercise. Which variable is the limiting factor in VO_2 max -- oxygen delivery or oxygen utilization? This is a central question that has created considerable debate among exercise physiologists over the years, but for most.

Normative data for VO_2max

Normative data for Female (values in ml/kg/min)

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

http://www.brianmac.co.uk/Vo2max.htm

Normative data for Male (values in ml/kg/min)

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<35.0	35.0 - 38.3	38.4 - 45.1	45.2 - 50.9	51.0 - 55.9	>55.9
20-29	<33.0	33.0 - 36.4	36.5 - 42.4	42.5 - 46.4	46.5 - 52.4	>52.4
30-39	<31.5	31.5 - 35.4	35.5 - 40.9	41.0 - 44.9	45.0 - 49.4	>49.4
40-49	<30.2	30.2 - 33.5	33.6 - 38.9	39.0 - 43.7	43.8 - 48.0	>48.0
50-59	<26.1	26.1 - 30.9	31.0 - 35.7	35.8 - 40.9	41.0 - 45.3	>45.3
60+	<20.5	20.5 - 26.0	26.1 - 32.2	32.3 - 36.4	36.5 - 44.2	>44.2

http://www.brianmac.co.uk/Vo2max.htm

2.6 Ventilation and Endurance Performance

The term ventilation is used in physiology circles exclusively in reference togas exchange in the lungs. The purpose of the lungs is to ventilate the blood.

Blood is the transport vehicle that carries oxygen to all of our cells, and carts off the constant production of CO2 that is produced as a by-product of both metabolism and pH buffering. The lungs are the site of pickup from and delivery to, the atmosphere. The greater the demand for oxygen delivery and CO2 removal, the greater the air volume that must circulate in and out of the lungs each minute.

Is ventilation volume a limiting factor to maximal endurance?

We can measure a person's maximal voluntary ventilation (MVV), the maximal volume of air they can breathe in and out while at rest, and compare it with their maximal ventilation during exercise. What we see is that untrained people only use about 60 to 85% of their maximum ventilatory capacity even at maximal exercise. For example the MVV for an average male might be nearly 200 l/min. However, during a treadmill VO2 max test, they reach a peak ventilation of only 140 l/min. Highly trained athletes use more of their capacity, perhaps over 90%, but ventilation capacity is still not a limitation on performance **(Sieler, 2000).**

2.7 Hemoglobin Concentration

Hemoglobin concentration X oxygen binding capacity of hemoglobin (ml O2/g hb) X percent saturation of hemoglobin = oxygen carried in a given volume of blood.

Hemoglobin concentration is expressed in grams of hemoglobin per deciliter of blood (g/dl). Typical values range between 12-14 for women and 14-16 for men. The binding capacity of hemoglobin for oxygen is a constant and equals 1.34 ml O2/g hemoglobin. Finally, the percent oxygen saturation of hemoglobin when it leaves the lungs is normally about 96% (it is not 100% largely because the lung tissue has its own blood supply and this small volume of deoxygenated blood mixes in with the fresh stuff).

If hemoglobin concentration is higher, the blood can carry more oxygen. This is an important point with relevance to altitude training.

2.8 Youth Sport and the Future of Sport

Youth sport has been indicated to be the component of sport development. Youth are the reservoirs of talent required for the future of sport.

International studies have highlighted the role of sport in the development of the social fabric and cultures in many countries. Physical activity in its various forms has been used to preserve indigenous cultures and traditions, which have been passed on form one generation to another.

The pattern of sports participation can be represented by a pyramid shape with the majority of performers near the bottom (or what is often referred to as the grass-roots level). At this level, schoolchildren and those playing sport as a hobby or social activity participate purely for the enjoyment it brings.

Figure 4: Hill, IN PURSUIT OF EXCELLENCE, 2007 p4

Higher up the pyramid, performers are more skilful and determined so that at approximately the halfway point we find performers training and competing on a regular/weekly basis. At or very near the top of the pyramid are the elite or

high-level performers who are totally committed to sport, often as a career, although not all of them may be professionals.

These elite groups contain those individuals with a special ability in sport that transcends the norm. They have reached, or are on the verge of reaching, the pinnacle of performance in their sport and are likely to be competing at national and international level.

The term 'excellence in sport' does, therefore, tend to be associated with this elite group of performers at the top of the sports pyramid.

The experiences of the nations that prosper in sport tell us that there is a strong systematic selection of elites from the grass root level. For instance we can look at the experiences of Chinese;

> "*China has one of the most effective systems in the world for systematically selecting and producing sporting talent from a very young age. This system was officially created in 1963 when the Sports Ministry issued the 'Regulations for Outstanding Athletes and Teams'. On the instructions of the Ministry, the selection of talented young athletes took place in every province. Over the years it has developed into a well-organized and tightly structured three-level pyramid: primary, intermediate and high level. The sports schools at county, city and provincial levels formed the base of the pyramid. After several years of training about 12 per cent of talented athletes from sports schools were selected to go on to provincial teams and become full-time athletes. From there, outstanding athletes progress to the top: the national squads and Olympic teams. The system remains in place today.In terms of selection procedures, when boys and girls between the ages of 6–9 years old are identified as having some talent in particular sports, they are sent to local sports schools throughout the country. They are trained 3 hours per day and 4–5 times per week. After a period of hard training the promising ones are promoted to semi-professional training: 4–5 hours".*

Houlihan, B. and Green, M. Comparative Elite Sport Development: systems, structures and public policy 2008, p40.

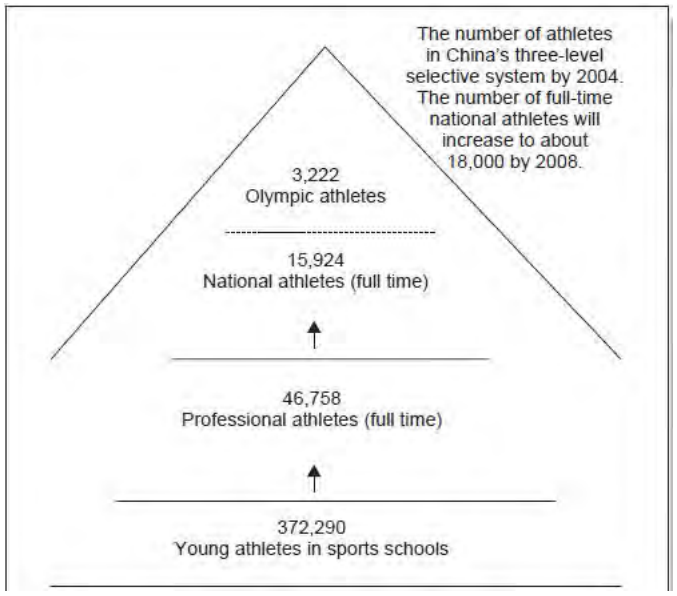

Figure 5: Houlihan, B. and Green, M. Comparative Elite Sport Development: systems, structures and public policy 2008, p40.

In order to produce elite sport 'stars' from a young age, local and provincial competitions should be a regular basis.

Sporting success depends upon having a structure in place that supports talented young performers every step of the way. Coaching, competition, facilities and support services need to be available at the appropriate level throughout the system not just at the elite end of sport. Creating a linked,

progressive system of talent development is vital if we are to provide an opportunity for the very best to emerge.

Carefully structured approaches to talent identification are now becoming commonplace in many sports. The use of talent scouts has traditionally been the major means by which the pathway to sporting excellence has been opened.

Formal or scientific testing involves a series of tests to determine the physical and physiological potential of young athletes for a specific sport. It is envisaged that psychomotor and even psychological testing will be increasingly utilized and become even more sophisticated as scientists continue to develop expertise in this area as a result of the increasing amount of data they receive.

CHAPTER THREE

STUDY DESIGN AND METHODOLOGY

This study ultimately focused on assessing the current condition as well as the future prospects of youth under athletics training centers of silte zone southern Ethiopia. This section of the study deals about the design which was employed in the study, subjects of the study, sampling method, data instruments and materials, procedure of data collection, organization and analysis of the data that will be collected.

3.1 Design of the Study

A descriptive survey design was employed in this study where summery of the characteristics of study variables of all samples was given. A quantitative approach was employed.

3.2 Subjects of the Study and Sampling Method

The population of this study is those youth currently working in the athletic training centers opened in Silte Zone southern Ethiopia. There are two athletics training centers currently working with youth. As long as this study is delimited only to those youth involved in the running events a total of 29 youth are currently involved in the running events in Alicho Wuriro regional project center where 7 of them refused to be subjects and 22 youth willingly accepted to be subjects. There are 17 youth in Alicho Wuriro federal project center where

4 refused to be samples and 13 youth came to be subjects of the study making a total of 35 samples. Specifically to every respective event 17 in 100 meters and 400 meters , 10 in 800 meters and1500 meters, 8 in 5000 meters and 10,000 meters.

3.3 Instruments of Data Collection

Primary data was collected using anthropometric measurement (height and weight) field tests for the identified samples of subjects, and questionnaire for youth athlete and coaches.

3.3.1 Anthropometric Measurement

Data on Weight and height of the samples is collected using available equipments. The procedures are indicated in the appendices.

3.3.2. The Field Tests for 100 Meters Athletes

Field tests are used to collect data on the physiological and motor abilities of the samples. The tests are indicated below accordingly to the events to which the samples are being training;

100 meters sprint youth athletes

a. 60 meter Speed Test

b. Explosive leg power Vertical jump

The detailed procedures used in the tests is indicated in the appendix

400 meters sprint youth athletes

c. 400 meters Predictor Test; Frank Horwill's 40 yard (36. 6 metres) tests

The detailed procedures used in the tests is indicated in the appendix

Middle distance athletes (800 and 1500 meters)

d. The 1500 meter Predictor Test was used to predict an athlete's 1500 meter time

Long distance athletes (5000 meters)

e. Long distance athletes (, 5000 and 10,000 meters)

   Cooper VO2max Test

   The Cooper Test is used to assess the development of the athlete's aerobic endurance and to obtain an estimate of their VO2max

3.3.3 Questionnaire

A researcher-based questionnaire was be used to collect data about the existing situation and the ways by which talented youth are identified. The questionnaire was designed for both coaches and youth in both centers.

The questionnaire of the youth athletes is constructed with 5 point ranking likert scale. The items are categorized as to deduce data regarding the coaches' methodology, pressures the athletes are feeling about and provision of facility and equipments.

Data was also collected from coaches working with youth athletes in the training centers. This as well is constructed with 5 point ranking likert scale. The items are categorized in blocks of experience of coaching, challenges prevailing in the center, coaching methodology, talent selection and identification and relationship of the center with stake holders.

3.4 Data Organization and Analysis

The data that was gathered by questionnaire was organized in tables. The data collected through field tests was analyzed using descriptive statistics of mean and range and comparison made using the standards at regional and national level. The quantitative data collected via field tests was organized for each specific event that is considered in this study. A discussion was provided that shows the existing status along with the currently developed literature.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

This chapter discusses the findings obtained as a result of the data analysis and provides interpretations as well.

Table1: 100 Meters Athletes' Physical and Physiological Condition

Sex	Age		Height		Weight		Leg Power		60 meters Dash (sec)	
	x	r	x	r	x	R	x	r	x	r
Male	16.8	4	1.66	0.14	57.3	16	20.33	8	8.73	0.57
Female	17.3	2	1.56	0.10	45.66	11	15.33	3	8.66	0.30

Table 1 shows the 100 meters physical characteristics and the potential time as a result of their maximum speed achieved over 60 meters. Accordingly, the mean age is 16.8 and 17.2 years of male and female athletes respectively, mean height 1.66 and 1.56 meters for male and female respectively, mean weight 57.3 and 45.66 kilograms for male and female respectively. Mean Leg power 20.33 and 15.33 centimeters for male and female athletes respectively, and 8.73 and 8.66 seconds of 60 meters sprint for male and female athletes respectively. The age range of male 100 meters athletes (youth) is indicated as 4. The age rage therefore is wide; the youth in this distance should not be

trained together. According to table 1, it can be concluded that the results of the 60 meter dash time is below from the age recordings so far in the event. Moreover, the anthropometrical characteristics are as well unsatisfactory compared to the records in the event. The youth in this event scored poor on the explosive leg power. The explosive leg power of both the male and female youth in the centers as well is found to be poor where as explosive power is among the physiological requirements in the distance.

Table 2: 400 Meters Athletes' Physical and Physiological Condition

	Age		**Height**		Weight		**3x36.6 m Dash test**		**Potential Time(sec)**		**Regional Standard**	
	X	**r**	**x**	**r**	**x**	**r**	**X**	**r**	**x**	**r**	**x**	**r**
Male	17.16	1	1.70	0.16	58.4	9	5.18	0.16	53.8	2.6		50.90
Female	16.66	2	1.52	0.22	46.33	12	5.36	0.06	57.56	0.06		61.60

According to table 2, the mean age of male and female 400 meters athletes is 17.16 and 16.66 years respectively, the mean height of male and female 400 meters athletes is 1.70 and 1.52 meters respectively, and the mean weight for male and female athletes' is 58.4 and 46.33 kilograms respectively. Table 2 also shows the potential time scored as a result of 3x36.6 dash test. Hence, the mean potential time for 400 meters for males and females athletes is 53. 8 and 57.56 seconds respectively. The potential of the female 400 meters runners' shows hope only and only if worked well and nurtured properly, they can perform at least up to the regional standard. Even though that the females in this distance show closer potential time to the regional standard, it is not so significant that it will be actualized. According to table 2, it can be concluded that that male 400 meters youth potential is below the standard set for regional level and it should be noted that a potential prediction will not be realized and is much different from the actual performance. Therefore, the concerned body

in training center shall take possible measures of recruiting the athletes in the 400 meters race as well investigate the currently working youth in the distance which they become very comfortable with and will achieve success. The goal of the training centers should be directed towards leading the youth to success.

Table 3: 800 and 1500 Meters Youth Athletes' Physical and Physiological Condition

	Age		**Height**		**Weight**		**Predicted Time(sec)**		**Regional Standard**
	x	r	x	r	x	R	x	r	
Male	17	2	1.69	0.21	55.29	26	198.53	10.12	240.20
Female	17.67	1	1.45	0.24	50.33	13	225.82	7.56	287.36

Table 3 shows the physical and physiological profile of 1500 meters athletes. Accordingly, the mean age of male and female athletes is 17 and 17.67 years respectively, mean height of male and female 1500 meters athletes is 1.69 and 1.45 meters respectively, and the mean weight of male and female 1500 meters athletes is 55.29 and 50.33 kilograms. Table 3 also shows predicted time which shows the potential of the athletes, i.e. 198.5 and 225.82 seconds for male and female 1500 athletes respectively. According to table 3, it can be concluded that the youth being identified in the distance posses a significant potential which can be flourished to world class performance provided the training environment will be geared towards the standardized level at least up to the standard in the nation. More over, the results of table 3 indicate that there is talent in this distance of the event and hence the concerned body in the area shall search talented youth from surrounding schools and different settings.

Table 4: long distance athletes' physical and physiological condition (5000 meters)

	Age		Height		Weight		12 min test(m)		VO2 max	
	x	r	x	r	x	R	x	r	x	r
Male	18	2	1.65	0.17	60.66	28	4048	10.2	79.21	2.28
Female	18	0	1.60	0	49	2	3965	10	77.36	0.23

Table 4 shows the physical and physiological profile of the 5000 meters athletes. The table shows that the mean age is 18 years for both male and female athletes, mean height is 1.65 and 1.60 meters of male female respectively, and mean weight 60.66 and 49 kilograms respectively for male and female athletes. As table 4 shows the mean value of 12 minutes test of male and female 5000 meters athletes' is 4048 and 3965 meters respectively and VO2 max 79.21 and 77.36 respectively. In conclusion, table 4 shows that the youth in the long distance posses the required physiological capacity of cardio respiratory performance. The results of table 4 show the youth in the distance posses superior or superb Vo2max value which provided with appropriate training environment will enable the youth to excellence. Accordingly, the concerned body shall work exhaustively to searching more talented youth in this category.

Athletes' responses from questionnaire

Table 5: Barriers of Athletes to their Athletic Development

	v. Insignificant 1		2		3		4		v. significant 5		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Financial hardships	6	17.1	-	-	1	2.9	2	5.7	26	4.3	35	100
Absence of quality competition	-	-	4	11.4	3	8.6	5	14.3	23	5.7	35	100

Time pressure (school and others)	2	5.7	3	8.6	8	22.9	8	22.9	14	40	35	100

Table 5 shows the athletes to their athletic development. Accordingly, 74.3 % of the athletes indicated that financial hardship is very significant, 65.7 % showed that absence of quality competition as very significant while 40 % responded time pressure to be very significant. According to table 5, it can be concluded that the athletes are suffering from barriers like financial hardship and absence of quality competition which possibly can hider and even lead them to drop out. Therefore, the local federation should strive to collaborate the society and organizations to find mechanisms whereby the youth in the center will get strong support and avoid pressures of such kind. Competition is vital for youth athletes and hence they shall be provided with continuous and progressive competition structure. Competition schedule or calendar also helps the coaches to periodize the training process so that all the activities will be designed accordingly.

Table 6: Access to Facilities and Services in the Training Center

	unsatisfactory 1		2		3		satisfactory 4		5		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Track	18	51.4	11	31.4	3	8.6	1	2.9	2	5.7	35	100
Academic service	7	20	12	34.3	10	28.6	-	-	6	17.1	35	100
Nutritional service	14	40	12	34.3	4	11.4	2	5.7	3	8.6	35	100
Equipments required for the event	21	60	2	5.7	2	5.7	2	5.7	8	22.9	35	100
Sport suits of training, competition	18	51.4	6	17.1	3	8.6	-	-	8	22.9	35	100
Shower and toilet in the center	22	62.9	2	5.7	2	5.7	1	2.9	8	22.9	35	100

Table 6 shows the athletes access to facilities and services provided in the training center. According to table 6, 51.4 % and 31.4 % showed that the track provided in the training center is very unsatisfactory and unsatisfactory respectively, 40 % and 34.3 % showed that the nutritional service provided is very unsatisfactory and unsatisfactory respectively, 51.4 % responded that sports suits provided for training and competition is very unsatisfactory 22.9 % indicated satisfactory. From table 6 it can be concluded that significant number of athletes suffer from lack of access to facility and services like track, nutritional provision, equipments and suits, as well as shower and toilet in the training center. All the above obstacles can be minimized provided the stake holders in the sport are made cognizant of the potentials of the youth. The training environment plays a vital role for the youth to excel in the sport he/she takes part in and success is achieved from the strong interplay between nature and nurture.

Table 7: Athletes Experience While Practicing in the Training Center

	Insignificant 1		2		3		4		significant 5		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Extreme fatigue	4	11.4	5	14.3	5	14.3	5	14.3	16	45.7	35	100
Lack of motivation	12	34.3	3	8.6	4	11.4	11	31.4	5	14.3	35	100
Severe practice conditions	5	14.3	5	14.3	5	14.3	11	31.4	9	25.7	35	100
Injury	11	31.4	3	8.6	9	25.7	8	22.9	4	11.4	35	100
Overtraining	7	20	4	11.4	9	25.7	11	31.4	4	11.4	35	100
Luck of support from coach	6	17.1	9	25.7	4	11.4	1	2.9	15	42.9	35	100
Luck of support from parents	7	20	7	20	4	11.4	10	28.6	7	20	35	100
Luck of support from team mates	10	28.6	9	25.7	5	14.3	10	28.6	1	2.9	35	100

Excessive amount of pressure	16	45.7	2	5.7	9	25.7	4	11.4	4	11.4	35	100
Unrealistic expectation form coach	16	45.7	1	2.9	5	14.3	**12**	34.3	1	2.9	35	100
Luck improvement	11	31.4	7	20	6	17.1	3	8.6	8	22.9	35	100
Reduced sense of accomplishment	19	54.3	6	17.1	6	17.1	-	-	4	11.4	35	100

Table 7 shows the athletes experiences in the training centers. Accordingly, 45.7 % of the athletes responded very significantly regarding the extreme fatigue they experience while 14.3 % responded insignificant. 31.4 % showed lack of motivation significantly while 34.3 % showed lack of motivation insignificant. 25.7 % and 31.4 % showed sever practice condition very significant and significant respectively. 22.9 % responded significant regarding incidence of injury while 31.4 % indicated very insignificant. 31.4 % indicated significant regarding experiencing overtraining while 20 % indicated very insignificant. 42.9 % indicated very insignificant support from the coach while 25.7 % indicated significant support from the coach. 20 % and 28.6 % indicated very significant and significant lack of support from parents respectively while 20 % and 20 % indicated very significant and insignificant lack of support from the parents. Coaches are the very immediate persons for athletes and hence the role of coaches is multidimensional. Significant number of studies has indicated that the cause of athlete drop out from their sport is coach related.

Table 8: Athletes' Feelings about their Performance

	S.Disagree 1		2		3		4		S. Agree 5		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
I often feel the time constraints that affect my performance	7	20			5	14.3	1	2.9	22	62.9	35	100
If I were less involved in other activities I would be a better athlete	-	-	-	-	4	11.4	3	8.6	28	80	35	100
How frequently do you get injured in the training center	f	%	f	%	f	%	f	%	f	%	f	%
Once in a week	-	-	7	20	2	5.7	1	2.9	25	71.4	35	100
Once in two weeks	3	8.6	-	-	13	37.1	-	-	19	54.3	35	100
Once in a month	6	17.1	7	20	-	-	-	-	22	62.9	35	100
Not at all	6	17.1	-	-	16	45.7	-	-	11	31.4	35	100

	Yes		No		Total	
	f	%	f	%	f	%
Have you suffered from a serious injury or illness that forced you to take significant time off during your training?	12	34.3	23	65.7	35	100
If your answer for the above item is yes, have you had received medical attention timely?	1	8.3	11	91.7	12	100

Table 8 shows the athletes feelings about their performance. Accordingly, 62.9 % strongly agreed that time constraint affected their performance where as 20 % responded strongly disagree on the same case and 80 % showed that they would be a better athlete if other activities are reduced. Like wise, 34.3 % % are identified to have suffered from serious injury or illness that forced them to take significant time from their training while 65.7 % responded no for serious

injury or illness. From the 34.3 % who indicated to have suffered from serious injury, only 8.3 % have received timely medical attention. In conclusion time constraint is found to be a limitation by the majority of youth athletes to come to better achievements. Likewise, significant numbers of athletes are forced to take time off from training as a result of illness and injury. This has been found to be the result of luck of timely medical treatments. These factors altogether

will lead the athletes to drop out from the sport hence serious medical attention follow up should be done in collaboration with the health centers around and education for coaches should be arranged progressively.

Athletes' Responses of the Didactic Methodology of Coaches

Table 9 a: Training Errors, Adequacy of Instruction, and Coach's Encouragement

	Strongly Agree 1		2		3		4		Strongly disagree 5		Total	
Training and adequacy of instruction	f	%	f	%	f	%	f	%	f	%	f	%
I do understand what he says easily	11	31.4	-	-	4	11.4	2	5.7	18	51.4	35	100
He used to make mistakes in demonstration	11	31.4	-	-	4	11.4	3	8.6	17	48.6	35	
He demonstrates step by step	14	40	2	5.7	3	8.6	2	5.7	14	40	35	
The activities go from easy to difficult	12	34.3	3	8.6	14	40	4	11.4	2	5.7	35	

Table (9 a) shows errors encountered, and adequacy of instruction of the coaches. Accordingly, 51.4 % strongly disagreed to easily understand what the coach says while 31.4 % strongly agreed, 48.6 % strongly disagreed that the

coach is used to make mistakes in demonstration while 31.4 % strongly agreed that the coach commits mistakes during demonstration. Simultaneously, 40 % replied strongly agree and 40 % strongly disagree that the demonstration is done step by step. Accordingly, it can be concluded that there is a significant gap in didactical procedures utilized by the coaches in the training centers. Teaching methods are relevant for coaches working with youth athletes where youth need to have adequate instruction and shall be addressed in a way that they understand what they says. Therefore, the coaches shall be given continuous education on how to work with youth athletes.

Athletes' Responses of the Methodology of Coaches

Table 9 b; Coach's Encouragement

	Strongly Agree 1		2		3		4		Strongly disagree 5		Total	
The coaches encouragement	f	%	f	%	f	%	f	%	f	%	f	%
Makes me believe that I can change	26	74.3	6	17.1	2	5.7	-	-	1	2.9	35	100
Shouts at me when I fail	7	20	8	22.9	-	-	-	-	20	57.1	35	
Very patient when I fail to perform	24	68.6	-	-	-	-	5	14.3	6	17.1	35	
Tells me that I am improving	29	82.9	3	8.6	1	2.9	-	-	2	5.7	35	

According to table (9b), 74.3 % responded strongly agree that the coach makes them believe that they can change, 20 % strongly agreed and 57.1 % strongly disagreed that the coach shouts when they fail where as 68.6 % strongly agreed that the coach is very patient when they fail to perform and 82.9 % strongly agreed that the coach tells them that they are improving. Learning

takes Place through repeated practice and hence the coaches should be made cognizant of the learning process.

Table 10; Motivation and Feedback of the Coaches to the Athletes

	Strongly Agree 1		2		3		4		Strongly disagree 5		Total	
Motivation	f	%	f	%	f	%	f	%	f	%	f	%
Recognize correct execution	22	62.9	4	11.4	9	25.7	-	-	-	-	35	100
Praise correct execution using word	23	65.7	4	11.4	4	11.4	2	5.7	2	5.7	35	100
hits parts of the body for recognition of	4	11.4	8	22.9	6	17.1	-	-	17	48.6	35	100

	Strongly Agree 1		2		3		4		Strongly disagree 5		Total	
Feedback of the coach	f	%	f	%	f	%	f	%	f	%		
Identifies areas of weakness exactly	9	25.7	-	-	6	17.1	14	40	6	17.1		
Provides corrections on spot	8	22.9	5	14.3	-	-	6	17.1	16	45.7		
Provides clear statements' on what to	17	48.6	-	-	-	-	15	42.9	3	8.6		

do												
Has got remedial to get my weaknesses solved	14	40	1	2.9	-	-	15	42.9	5	14.3		

Table 10 shows the motivation and feedback provided from the coach to the athletes. Accordingly, 62.9 % replied strongly agree that the coach recognizes correct execution and 65.7 % responded strongly agree that the coach praise correct executions while 48.6 % responded strongly disagree that the coach hits part of body for recognition of correct execution. Similarly, 40 % disagreed regarding the coaches role in identifying weakness exactly where as 25 % strongly agreed on the coaches' role in identifying weaknesses. 45.7% strongly disagreed that coaches' feedback and corrections are immediately given during practice while 22.9 % strongly agreed, and 42.9 % of respondents disagreed that the coach provides clear statements on what to do and on getting remedial for their weaknesses. According to table 9 it can be concluded that coaches luck sufficient knowledge on identifying weakness, timing of feedbacks and organizing remedial practices. This is the central point in youth learning and should be given serious attention through education for coaches.

Analysis of Coaches' Responses from Questionnaire

Table 11: Demographic Information of Coaches

			Masters		Degree		Diploma		Below diploma		Total	
			f		f		F		f		f	
Educational qualification in physical education			-		1		1		1		3	
	No at all		1st level		2nd level		3rd level		Interme diate		Total	
	f	%	f	%	f	%	f	%	F	%	f	%
Level of	3	100	-	-	-	-	-	-	-	-	3	100

coaching												

According to table 11, none of the coaches showed level coaching they hold. Regarding the educational qualification of the coaches, table 10 shows that 1 bachelor's degree holder, one diploma holder and one with below diploma. Accordingly, the number of the coaches and the level of coaching is found unsatisfactory, hence continuous training education shall be considered in plan as with increasing the number of coaches working with the youth.

Table 12: Experience of Coaching

	V.significant 5		4		3		2		Insignificant 1		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
As an assistance coaches with youth	-	-	-	-	-	-	3	100	-	-	3	100
Having a mentor	-	-	-	-	-	-	-	-	3	100	3	100
Experience of being athlete	-	-	-	-	-	-	-	-	3	100	3	100
Interaction with parent	-	-	-	-	-	-	-	-	3	100	3	100

Table 12 shows the experience of the coaches. Accordingly, all (100%) showed insignificant experience as an assistance coach with youth before, 100 % showed very insignificant experience working with a mentor, 100 % indicated very insignificant experience of being an athlete and 100 % responded very insignificant interaction with the parents. It can be concluded that the coaches luck progressive experiential knowledge as being athlete, either as assistant coach or having a mentor. Education, continuous training and professional development along with practical experience make coach a better person ready to help and assist the youth.

Table 13: Coaches' Response on the most Important Criterion of Talent Detection and Selection

	V. significant 5		4		3		V. Insignificant 2				Total	
	f	%	f	%	f	%	f	%	f	%	f	%
7 Motor Ability	1	33.3	2	66.7	-	-	-	-	-	-	3	100
8 Physiological	-	-	1	33.3	2	66.7	-	-	-	-	3	100
9 Anthropometrical	-	-	-	-	-	-	3	100	-	-	3	100
10 Psychological	-	-	-	-	-	-	-	-	3	-	3	100

Table 13 shows the figures obtained on the most important criterion prioritized for talent detection and selection. Table 13 shows that 66.7 % and 33.3 % indicated significant and very significant consideration for motor ability while 33.3 % responded significant consideration for physiological aspects. Contrary to this, 100 % indicated insignificant consideration of anthropometrical aspects and similarly 100 % indicated very insignificant consideration of psychological aspects. In conclusion, anthropometrical and psychological consideration are neglected from the criterions used to select talent where as the current literature is in favor of the predictive role of anthropometrical and psychological component.

Table 14: Method of Talent Detection and Selection

V.significant 5	4	3	Insignificant 2	1	Total

	f	%	f	%	f	%	f	%	f	%	f	%
Observation	1	33.3	-	-	2	66.7	-	-	-	-	3	100
Competition	-	-	-	-	1	33.3	2	66.7	-	-	3	100
Tests of the four aspects	3	100	-	-	-	-	-	-	-	-	3	100

Table 14 shows that 33.3 of the respondents replied very significant on observation as method of talent detection, 66.7 % indicated insignificant for utilization of competition as a method of detecting and selecting talented children where as 100 % responded very significant on the use of tests to detect and select individuals.

Table 15: Challenges Faced in Training Centers

	V.significant 5		4		3		2		Insignificant 1		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Limited practice time	1	33.3	2	66.7	-	-	-	-	-	-	3	100
Lack of Equipments and facility	3	100	-	-	-	-	-	-	-	-	3	100
Financial hard ship	-	-	-	-	3	100	-	-	-	-	3	100
Absence of quality competition	2	66.7	1	33.3	-	-	-	-	-	-	3	100
Time pressures	-	-	2	66.7	1	33.3	-	-	-	-	3	100
Very few coaching staff	1	33.3	2	66.7	-	-	-	-	-	-	3	100
Lack of Parent support for the youth	3	100	-	-	-	-	-	-	-	-	3	100
Lack the community involvement	3	100	-	-	-	-	-	-	-	-	3	100
Lack of relationship with other clubs and organizations	3	100	-	-	-	-	-	-	-	-	3	100

Table 15 shows the figures of coaches responses regarding challenges faced in the training centers. Accordingly, 66.7 % and 33.3 % showed significant and very significant for limited practice time, 100 % responded very significant on the lack of equipments and facilities. 66.7 % and 33.3 % answered very significant and significant on the absence of quality competition. 66.7 % indicated significant time pressure, 66.7 % and 33.3 % replied significant and very significant for shortage or few coaching staff. Similarly, 100 % indicated very significant lack of support, 100 % indicated very significant lack of community support and involvement and 100 % indicated very significant lack of relationship with other clubs and organizations. Accordingly, limited practice time, equipments and facility, quality competition, coaching staff, lack of parent and community involvement and luck of link with sister organizations and clubs are found to significant challenges.

Table 16: Methodology of Coaching Utilized by Coaches

	S. Agree 5		4		3		2		S. Disagree 1		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Planning of every practice session	-	-	-	-	1	33.3	2	66.7	-	-	3	100
Instructions are clear and precise	-	-	2	66.7	1	33.3	-	-	-	-	3	100
Demonstrations in every practice session	-	-	1	33.3	-	-	2	66.7	-	-	3	100
Identify errors in the practice	1	33.3	2	66.7	-	-	-	-	-	-	3	100
Provide timely feedback in words and actions	1	33.3	2	66.7	-	-	-	-	-	-	3	100
Activities are appropriate to the age group always	1	33.3	-	-	-	-	2	66.7	-	-	3	100

According to 16, 66.7 % disagreed to planning of every practice session, 66.7 % agreed on providing clear and precise instruction. 66.7 % disagreed to providing demonstrations in every practice session while 33.3 % agreed. 66.7 % and 33.3 % responded agree and strongly agree on identifying errors in practice respectively. 66.7 % and 33.3 % replied agree and strongly on providing timely feedback respectively. 66.7 % replied agree on providing age appropriate activities while 33.3 % strongly disagreed. Accordingly, preparation for every session practice, demonstrations and devising age appropriate activities are found to be lucking in the coaches.

Table 17: The Centers Interaction with the Environment around and with Different Organizations

	V. significant 5		4		3		2		V. Insignificant 1		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
School	-	-	2	66.7	1	33.3	-	-	-	-	3	100
Parents/family	-	-	-	-	1	33.3	2	66.7	-	-	3	100
Related team or clubs	-	-	-	-	-	-	-	-	3	100	3	100
Federation	-	-	-	-	1	33.3	2	66.7	-	-	3	100

According to table 17, 66.7 % responded very significant for the centers interaction with schools, 66.7 % indicated insignificant interaction with parents and families of the youth. Similarly, 100 % indicated very insignificant relation with clubs and 66.7 % showed insignificant relation federation at different levels. In conclusion, relationship with stakeholders is insignificant.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary

The ultimate goal of this study was to examine the athletic training centers opened in silte zone, southern Ethiopia. The study mainly focused on the current conditions of the youth being trained in the centers.

The study was targeted mainly to answer the following research questions;

a. What is the physical and anthropometric characteristics' of youth involved in the running events of the training centers in silte zone?
b. What are the ways by which young athletes are selected and allowed to join the training centers where deliberate practice and training is provided?
c. What is the current condition (physiological characteristics) of the youth involved in the running events of training centers in silte zone as a function of field tests?
d. What is the current condition and future prospect of the youth involved in the running events of training centers in silte zone?
e. What internal and external environmental factors exist?
f. How is the coaching methodology of the coaches?
g. What is the relationship of the training centers with stake holdrs?

The study was delimited to only those youth involved in running events currently joined the training centers established in Silte zone southern Ethiopia.

A total of 29 youth are currently involved in the running events in Alicho Wuriro regional project center where 7 of them refused to be subjects and 22 youth willingly accepted to be subjects. There are 17 youth in Alicho Wuriro

federal project center where 4 refused to be samples and 13 youth came to be subjects of the study making a total of 35 samples. Specifically to every respective event 17 in 100 meters and 400 meters , 10 in 800 meters and1500 meters, 8 in 5000 meters and 10,000 meters. Data was collected using fitness tests, anthropometrical measurements (height and weight) and researcher made questionnaire for athletes and coaches'.

5.2. Conclusion

According to the analysis of the data collected from fitness tests and questionnaire, the following conclusions are drawn;

1. 60 meter sprint time of 100 meters sprinters is below from the recordings so far in the event. Moreover, the anthropometrical characteristics are as well unsatisfactory compared to the records in the event. Youth athletes of 100 meters scored poor on the explosive leg power. The explosive leg power of both the male and female youth in the centers as well is found to be poor where as explosive power is among the physiological requirements in the distance (table 1 p 40).
2. The potential of the female 400 meters runners' it is not significant that it will be actualized. According to table 2 p41, it can be concluded that that male 400 meters youth potential is below the standard set for regional level and it should be noted that a potential prediction will not be realized 100% and is much different from the actual performance.
3. The youth identified in 800 and 1500 meters race posses a significant potential which can be flourished to world class performance provided the training environment will be geared towards the standardized level at least up to the standard in the nation. More over, the results of table 3, p 42 indicates that there is talent in these distances of the event and hence the concerned body in the area shall search talented youth from surrounding schools and different settings.

4. The youth in the long distance posses the required physiological capacity of cardio respiratory performance. The results of table 4, p 42 shows the youth in the 5000 meters distance posses superb Vo2max value which provided with appropriate training environment will enable the youth to excellence. The concerned body should undertake talent detection in these areas in the endurance sports very exhaustively.
5. According to table 5, p 43, it can be concluded that the youth athletes are suffering from barriers of financial hardship and absence of quality competition which possibly can hider and even lead them to drop out.
6. Significant numbers of athletes suffer from lack of access to facility and services of track, nutritional provision, equipments and suits, as well as shower and toilet in the training center (table 6, p 44).Time constraint is found to be a limitation by the majority of youth athletes. Likewise, significant numbers of athletes are forced to take abundant time off from training as a result of illness and injury. This has been found to be the result of luck of timely medical treatments (table 8, p 46).
7. It is found out that there is a significant gap in didactical methodology of coaching procedures utilized by the coaches in the training centers. Teaching methods are relevant for coaches working with youth athletes where youth need to have adequate instruction and shall be addressed in a way that they understand what the coach says (table 9a, p 48). Preparation for every session practice, demonstrations and planning age appropriate activities are found to be lacking in the coaches (table 16, p 55). It is also found out that the coaches luck sufficient knowledge on identifying weakness, timing of feedbacks and organizing remedial practices (table 10, p49). The coaches luck progressive experiential knowledge as being athlete, either as assistant coach or having a mentor (table 12, p 51).
8. Anthropometrical consideration are neglected from the criterions used to select talent where as the current literature is in favor of the predictive role of anthropometrical and psychological component (table 13, p53). It

is found out that there is significant shortage of coaching staff(table 15, p54) and the centers relationship with other stakeholders is insignificant (table17, p56).

5.3. Recommendation

Based on the conclusion drawn the researcher forwarded the following recommendation as follows.

1. The talent detection and selection procedure should incorporate all the criterions for each event in the training centers. Anthropometrical, physical and physiological as well as psychological aspects should be considered. The concerned body in training center shall take possible measures of recruiting the youth athletes in the 100 and 400 meters sprint. Moreover, the youth athletes currently working in the 100 meters and 400 meters shall be examined in all performance factors in the events as they luck the necessary predictor.

2. The youth identified in 800, 1500 and 5000 meters events posses' significant potential and physiological demands. Hence the concerned body in the area shall search more talented youth from surrounding schools and different settings with objective criterions which comprises all the four factors of performance.

3. The athletes have multitude of internal and external problems in the training centers which if allowed persisting will force them drop out from the center. The majority of youth take their time to compensate for financial hardship which they have indicated as time pressure. The concerned body with the help of stakeholders should find ways of sponsoring and fundraising activities and at least assist the very needy youth athletes'. Training equipments' required for each specific event and training suits should be provided and the concerned body in cooperation

with stake holders should facilitate shower and toilet services around the training centers. The concerned body should look for quality competitions for the youth locally, regionally and nationally in cooperation with stake holders. Success for the youth is the result of accumulated experience whish literature also supports. The concerned bodies provide at least well prepared ground with standard measurement to replace track. Nutritional provision as well should be considered as long as youth training is concerned when this is a critical growth period and relies strongly on what the youth athlete consume.

4. The coaches should be given additional training and education, should be full time coaches where time pressure might be solved. The number of coaches should be increased. The coaching staff should have the experiences of other well established centers which will help them to promote and enhance. The training centers should establish strong relationship with the organizations around like schools, health centers, NGO's and private organizations including families. The Centers link should extend to clubs and academies so that it will be possible to periodically examine the potential of the youth athlete and hence the youth will be promoted to a higher level of training and preparation.

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Web Sites

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APPENDIX A

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULTY OF LIFE SCIENCE

DEPARTMENT OF SPORT SCIENCE

QUESTIONNAIRE TO BE FILLED BY YOUTH ATHLETES IN THE TRAINING CENTERS

Dear athletes this questionnaire is prepared to assess the problems that exist in your training center and forward possible recommendation. Here in this format you are not requested to write your personal profiles and feel confident that the answers will be used only for the research purpose. Your genuine answers are therefore significantly important for the study to be fruitful. All thanks in advance for the cooperation and genuine answers.

Athlete General Information

Please fill in the blank space with appropriate response regarding your personal information.

1. **Sex** M☐ F ☐
2. **Age**_____ Training Age_____
3. **Weight**_____
4. **Height**_____
5. **Discipline** - Long distance ☐
   -Middle distance ☐
   - Short distance ☐

Event you train _____

DIRECTION:-The followings are statements referring to current condition and future prospect of youth athletic training centers opened in silte zone southern Ethiopia. Five point scales (from **strongly agree** to **strongly disagree)** are given corresponding to each statement. Please put **circle** for one of the scale which best describe your assessment of each statement.

1. How significant are the following barriers to your athletic development. Please respond using the following scale

	V. Insignificant	*Insignificant*	*Neutral*	*Significant*	*Very Significant*
Financial hardships	1	2	3	4	5
Absence of quality competition	1	2	3	4	5
Time pressures (School/other interests)	1	2	3	4	5
Parental support	1	2	3	4	5

Other (please specify) _____

2. How is **your** assessment to the following services and facilities in your athletic training center? Circle the number that best indicates your answer

	V. Unsatisfactory	Unsatisfactory	*Neutral*	Satisfactory	Very satisfactory
Track	1	2	3	4	5
Academic Service	1	2	3	4	5
Nutritional Services	1	2	3	4	5
Equipments required for Your event Sports suits (Spikes, shorts and jerseys)	1	2	3	4	5
Shower and toilet	1	2	3	4	5

3. I believe I have experienced

	V. Insignificant	Insignificant	*Neutral*	*Significant*	*Very Significant*
Extreme fatigue	1	2	3	4	5
Lack of motivation	1	2	3	4	5
Severe practice conditions	1	2	3	4	5
Injury	1	2	3	4	5
Overtraining	1	2	3	4	5
Lack of support from coaches	1	2	3	4	5
Lack of support from parent (s)	1	2	3	4	5
Lack of support from teammate (s)	1	2	3	4	5
Excessive amounts of pressure	1	2	3	4	5
Unrealistic expectations	1	2	3	4	5
A lack of improvement	1	2	3	4	5
Reduced sense of accomplishment	1	2	3	4	5

4. I often feel the time constraints that affect my performance.(Circle the number that best applies)

Definitely Disagree Definitely Agree

1 2 3 4 5

5. If I were less involved in other activities I would be a better athlete.

Definitely Disagree Definitely Agree

1 2 3 4 5

6. Have you suffered from a serious injury or illness that forced you to take significant time off during your training in the training center?

__ Yes ___ No

7. If your answer for item 6 is yes, have you had received medical attention timely?

_____

8. How frequently do you get injured in the training center

	Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
___Once a week	1	2	3	4	5
___Once in two weeks	1	2	3	4	5
___Once in a month	1	2	3	4	5
___Not at all	1	2	3	4	5

9. Coaching methodology of the coaches

	Strongly Agree	Agree	*Neutral*	Disagree	Strongly Disagree
Training errors and inadequate instruction					
I do understand what he says easily	1	2	3	4	5
He used to make mistakes in demonstration	1	2	3	4	5
He demonstrates step by	1	2	3	4	5

step					
The activities go from easy to difficult	1	2	3	4	5
Encouragement from the coach	1	2	3	4	5
Makes me believe that I can change	1	2	3	4	5
Shouts at me when I fail					
Very patient when I fail to perform	1	2	3	4	5
Tells me that I am improving	1	2	3	4	5
Motivation					
Recognize correct execution	1	2	3	4	5
Praise correct execution using words	1	2	3	4	5
Hits parts of the body for recognition of correct execution	1	2	3	4	5
Feed back of the coach					
Identifies areas of weakness exactly	1	2	3	4	5
Provides corrections on spot	1	2	3	4	5
Provides clear statements' on what to do	1	2	3	4	5
Has got remedial to get my weaknesses solved	1	2	3	4	5

Thank you in advance

APPENDIX B

QUESTIONNAIRE DESIGNED FOR COACHES WORKING IN THE CENTERS

Dear coaches this questionnaire is prepared to asses the problems that exist in your training center and forward possible recommendation. Here in this format you are not requested your personal profiles and feel confident that the answers will be used only for the research purpose. Your genuine answers are therefore significantly important for the study to be fruitful. All thanks in advance for the cooperation and genuine answers.

1. Level of coaching

Position/ Rank Intermediate ------1st-----2nd ------- 3rd------- lowest level

Educational Status- M.A. (physical education) B.A. (physical education)

Diploma

2. Experience of coaching

	V. Insignificant	*Insignificant*	*Neutral*	*Significant*	*Very Significant*
As an assistance coaches with youth	1	2	3	4	5
Having a mentor	1	2	3	4	5
Interaction with parents	1	2	3	4	5
Experience of being athlete of any sport	1	2	3	4	5

3. The priority of the most important criterion to select individuals

	V. Insignificant	*Insignificant*	*Neutral*	*Significant*	*Very Significant*
Motor Ability	1	2	3	4	5
Physiological	1	2	3	4	5
Anthropometrical	1	2	3	4	5
Psychological	1	2	3	4	5

4. Method of talent identification

	Strongly agree	Agree	*Neutral*	Disagree	Strongly disagree
Observation	1	2	3	4	5
Competition	1	2	3	4	5
Tests of the four aspects	1	2	3	4	5

5. Challenges faced in training centers

	V. Insignificant	*Insignificant*	*Neutral*	*Significant*	*Very Significant*
Limited practice time	1	2	3	4	5
Equipments and facility	1	2	3	4	5
Financial hardships	1	2	3	4	5
Absence of quality competition	1	2	3	4	5
Time pressures	1	2	3	4	5
Very few coaching staff	1	2	3	4	5
Parent support for the youth	1	2	3	4	5
The community involvement	1	2	3	4	5
The centers relationship with other clubs	1	2	3	4	5

6. Method of coaching

	Strongly agree	Agree	*Neutral*	Disagree	Strongly disagree
Planning of every practice session	1	2	3	4	5
Instructions are clear and precise	1	2	3	4	5
Demonstrations in every practice session	1	2	3	4	5
Identify errors in the practice	1	2	3	4	5
Provide timely feedback in words and actions	1	2	3	4	5
Activities are appropriate to the age	1	2	3	4	5
Group always	1	2	3	4	5

7. How do you see the way in which the center interacts with the environment around it and stakeholders?

	Very Significant	*Significant*	*Neutral*	Very insignificant	Insignificant
School	1	2	3	4	5
Parents/family	1	2	3	4	5
Related team or clubs	1	2	3	4	5
Federation	1	2	3	4	5

8. Please provide examples of the center's working in relations with

_____

_____

9. How would you describe the training center's main resources?

Facilities _____

Coach education

level_____

Other staff _____

Financial resources

_____

Other? _____

Thank you in advance

Appendix C

Weight and Height Measurement Procedure

Weight

Purpose of test/measurement: To determine the body weight of the participant.

Equipment used:

Calibrated electronic digital scale or with available equipments in clinics or local health centers

Procedure used:

- The participants will be barefoot and wear only light clothing.
- The electronic scale was zeroed before the participants stepped to it.
- The participant will stand still and erect with his body weight evenly

Number of measurements

1 **Scoring:** the participant's weight will be recorded in kilograms to the nearest 0.01kg.

Height

Purpose of test/measurement: To measure the distance from the floor or standing surface to the vertex on the head in the mid-sagittal plane with the head.

Equipment used: Stadiometer or with available equipments

Procedure to be used:

- The participant stands erect, bare feet with his heels, buttocks and shoulders pressed against the wall.
- The heels are together with arms hanging freely by the side (palms face thighs)
- The head will not tilt backwards
- The participant is instructed to look straight ahead, breathe in and stand as tall as possible with the weight of the participant evenly distributed over both feet and the participant's heels will not be raised. The measurement was taken at the end of the deep inward breath

Number of measurements

1 Scoring: The participant's height was measured in centimeters to the nearest 0.1cm.

Appendix D

Short distance athletes 100 meters youth athletes physiological and motor measurement procedure

100 meters athletes

60 meter Speed Test

Purpose of test/measurement: To measure the acceleration speed predict 100 meter time

Required Resources

To undertake this test you will require:

- Flat non-slip surface
- Stopwatch
- An assistant

Procedures

This test requires the athlete to sprint as fast as possible over 60 meters

- The athlete warms up for 10 minutes
- The 60 meter straight section will be marked on the track with cones
- The assistant gives the command "GO" and starts the stopwatch
- The athlete sprints as fast as possible over the 60 meters
- The assistant stops the stopwatch as the athlete's torso crosses the finishing line and records the time
- The test was conducted 3 times
- The fastest recorded time to assess the athlete's performance will be used.

Explosive leg power Vertical jump

Purpose of test/measurement: To assess the power of the legs by measuring the vertical distance that the participant could jump

Equipment used:

Wall painted

Powder chalk

Procedure to be used:

- The participants stand facing forward (perpendicular to the wall) with their right shoulder facing the wall.
- The fingertips of their right hand then be used to put a mark upward to set their reaching height at the zero level of the wall without lifting their heels off the ground.
- The right hand fingertips are then be chalked and with the right hand side to the wall while facing forward (standing perpendicular to the wall), arms hanging at their sides, a jump will be made straight upward and another mark will be made at the top of the jump on the wall with the chalked fingertips of the right hand.
- No preliminary run or hop was allowed, however, the participant is allowed to bend their knees preparatory to the jump.
- The highest distance jump to the nearest 1cm (jumping height) was recorded.

Number of trials 2

Scoring: The jumping height of the two trials was measured to the nearest 1cm. The highest distance was used.

Appendix E

400 meters youth athletes' potential time prediction test procedure

400m Predictor Test

Objective

Frank Horwill's 40 yard (36. 6 metres) tests was used to predict an athlete's potential 400 meter time.

Required Resources

To undertake this test you required:

- Flat non-slip surface
- Measuring tape
- Stopwatch
- Cones
- Assistant

Procedure to be used

This test requires the athlete to conduct 3 x 40 yard time trails.

- The athlete warms up for 10 minutes
- a 40 yard straight section was marked with cones
- The athlete takes up a sprint start position
- The assistant gives the commands "On Your Marks, Set, GO" and starts the stopwatch
- The athlete sprints the 40 yards
- The assistance stops the stopwatch when the athlete's torso crosses the finishing line and records the time
- The athlete conducts 3 x 40 yard sprints with a 5 minute recovery between each sprint
- The fastest time to assess the athlete's performance will be used

The athlete's potential 400 meter time, in seconds, can be calculated as follows:

- Male athletes = (Time for 40 yards × 10) + 2
- Female athletes = (Time for 40 yards × 10) + 4

Appendix F

Middle distance athletes (800 and 1500 meters) predictor test procedure

800 meters athletes

1500 meters athlete

The 1500 meter Predictor Test was used to predict an athlete's 1500 meter time.

Required Resources to undertake this test:

- 400 meter track
- Stopwatch
- Assistant

How to conduct the test

The athlete was required to run 2 sets of

- 400 meters
- 45 seconds recovery
- 800 meters
- 90 seconds recovery
- 300 meters
- 3 minutes recovery

The time for each run was recorded and the accumulated time for each set is recorded. The average time of these two accumulated times is the predicted 1500 meters time for the athlete.

Appendix G

Long distance athletes (5000 meters) Cooper VO2max Test procedure

Cooper VO2max Test

The Cooper Test is used to assess the development of the athlete's aerobic endurance and to obtain an estimate of their VO2max

Required Resources

To undertake this test you required:

- 400 meter track
- Stopwatch
- Whistle
- Assistant

Procedure
This test requires the athlete to run as far as possible in 12 minutes.

- The athlete warms up for 10 minutes
- The assistant gives the command "GO", starts the stopwatch and the athlete commences the test
- The assistant keeps the athlete informed of the remaining time at the end of each lap (400m)
- The assistant blows the whistle when the 12 minutes has elapsed and records the distance the athlete covered to the nearest 10 meters
- The distance covered was used to calculate VO2max

VO2max
An estimate of VO2max was calculated as follows:
(Distance covered in meters - 504.9) ÷44.73

Declaration

I, the undersigned declared that this is my original work, has not been presented for a degree in any other university and that all sources of materials used for the thesis has been duly acknowledge.

Name: _____

Signature:_____

Place: Department of Sport Science

Addis Ababa University

School of Graduate Studies

Date of submission:_____

This thesis has been submitted for examination with my approval as a university advisor.

Name: _____

Signature:_____

Date of submission:_____