DEBRE BRHAN UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE DEPARTMENT OF SPORT SCIENCE

THE MAJOR DETERMINANT VARIABLES INFLUENCE JAVELIN AND DISCUS THROW ATHLETES PERFORMANCE IN FOUR AMHARA NATIONAL REGIONAL STATE ATHLETICS SPORT CLUB

BY:-

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JUNE, 2011

DEBRE BIRHAN, ETHIOPIA

A THESIS SUBMITTED TO GRADUATE PROGRAM OF DEBRE BIRHAN UNIVERSITY COLLEAGE OF NATURAL AND COPUTETIONAL SCEINCE DEPARTMENT OF SPORT SCEINCE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN SPORT MANAGEMENT

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APPROVAL SHEET

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As member of the examining board of final M.Sc. open defense, we certify that we have read and evaluated this thesis prepared by **YESHISEW GASHAW** entitled: **THE MAJOR DETERMINANT VARIABLES INFLUENCE JAVELIN AND DISCUS THROW PERFORMANCE IN FOUR AMHARA REGIONAL STATE ATHLETICS SPORT CLUB** and recommended that it be accepted as fulfilling the thesis requirements for the degree of MASTER OF SCIENCE IN SPORT MANAGEMENT

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Name of Chairman, DGC Signature Date

4._____ _____ _____

Name of Chairman, CGS Signature Date

Declaration

This thesis is for the degree of Master on "**THE MAJOR DETERMINANT VARIABLES INFLUENCE JAVELIN AND DISCUS THROW PERFORMANCE IN FOUR AMHARA REGIONAL STATE ATHLETICS SPORT CLUB"** It is my original work and it has not previously formed by other researcher.

Name: - YESHISEW GASHAW

Signature ----------

Date ----------

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Finally, I would like to say thank you my research participants athletes, coaches and club coordinators who showed their willingness and cooperation in giving me the adequate and valuable information and support to undertake this study..

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ABSTRACT

This research was aimed at identifying the major determinate variables that influence javelin and discus throw performance. The research was employed descriptive survey and inferential statistics. The participants of this study were 11 discus, 12 javelin thrower and 9 coaches, 2 managers and 2 coordinator were involved in the study. The purposive sampling techniques are used to conduct and select the respondents. Methods of data gathering tools were used to structure questioner's in-depth interview and observation have been employed. The data have been analyzed and interpreted based on both quantitative and qualitative method. Correlation analysis and multi-linear regression is used to analysis the quantitative data obtain from research questions. For the interview an open ended questions and the data can be obtained through observation and documentation it is described form of qualitative explanation methods & percentage is used to analyze all descriptive survey and based on the characteristics of respondents such as age, sex, educational qualification and experience. As the findings showed that, knowledge, skill and technique gape have been observed in both athletes and coaches, lack of interest and commitment of coaches, athletes ,coordinators and managers for the throwing event and the training program is not conceded as the level of athletes performance ,experience and training age, coaches have little emphasis for scientific ways of anthropometric measurement and athlete recruitment procedure, lack of clear communication and discussion between coaches and athletes for their training plan, coaches have good management and leadership qualities and lack of necessary sport facilities standardize gymnasium materials.

Key words: - *Aerodynamic, Anthropometry, Delivery phase, Power position, Release speed: Recruit, Release Angle, , influence, Variables*

ACRONYMS / ABBRIVATION

AAF: - Amhara Athletics Federation

EAF: - Ethiopian Athletics Federation

ENSF: - Ethiopia National Sport Federation

ENSP: - Ethiopia National Sport Policy

NGO:- Non-Governmental Organization

IAAF: - International Athletics Association Federation

IOC: - International Olympic Committee

SRT: - Specific Resistance Training

SMST: - Specific muscular strength training

SLWT: - Specific lower body weight training

SUWT: - Specific Upper Body Weight Training

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Chapter one

1. Introduction

1.1. Background of the study

Modern sport has a history of over half a century in this country. Even if, many types of games are introduced within this period, the development of modern sport is still at the infancy level. The causes for these are organizational, economical and that of outlook. As the leadership in sports lacked a popular base in this country, it has been undergoing a series of continuous reorganization. Its focus has been on organizing competitive sports for the very few elite athletes (Ethiopian National Sport Policy [ENSP], 2004).They have gained recognition by themselves rather than nurturing sport as publics‟ culture.

Athletics was listed into game events in Athens first ancient Olympic Games in 776 B.C. In the earliest athletics game, only short-distance run such one item, still the 10th Olympic Games it listed into javelin throw, discuss throw and long jump as well as other game events, and hammer hasn't been listed into field events until the 2nd Olympic Games in 1900, is a kind of later development field event.

Discus Throw can be traced back into the ancient Greece, where in the Olympiad games this sport was used to be organized to judge the physical strength of the athletes. This game was also popular because it requires high precision and coordination. During that time it was believed to be one of the easiest sport events. Some eminent historic proofs shows that the trace of this game was found during the period of 708 B.C. soon after its addition into 18th Olympiad games it was also introduced into pentathlon games that included wrestling, running, javelin throw, and jumping. According to the facts of Perseus digital library, earlier times the discus used to be made up from stones, bronze, or iron.

During the Middle Ages organized track and field all but disappeared. The true development of track and field as a modern sport started in England during the 19th century. English public school and university students gave the sport impetus through their interclass meets, or meetings as they are still called in Britain, and in 1849 the Royal Military Academy held the

first organized track and field meet of modern times. Not until the 1860s, however, did the sport flourish. In 1866 the first English championships were held by the newly formed Amateur Athletic Club, which opened the competition to all "gentlemen amateurs"--specifically, athletes who received no financial compensation for their efforts. In 1896 the first modern Olympic Games were staged. Although initially of limited appeal, the Olympics captured the imagination of athletes and grew steadily, making track and field an international sport for the first time. In 1912 the International Amateur was formed by representatives from 17 countries. The IAAF was charged with establishing standard rules for the sport, approving world records, and ensuring that the amateur code was adhered to; it continues to carry out these duties today. The participation of women in track and field is a relatively recent development. In 1921 representatives from six countries formed an athletic federation for women, which merged with the IAAF in 1936. Participation by women has grown rapidly in many countries in recent years, particularly in the United States, where many schools have added women's track and field to their athletic programs. (http://www.iaaf.org/.../index.html) Athletic Federation (IAAF)

Sport activities including athletics have long past but short history in Ethiopian. In Ethiopian the exact roots of Athletics sport cannot be traced accurately. However, there is a belief that sport was widely practiced in schools and military before 1897. Moreover, it is widely believed that modern athletics has been originated following the start of modern education and military Services.

Ethiopia has indeed offered the world some remarkable athletes that will never be forgotten in history of the sport. In order to achieve all they can in their sporting pursuits and receive all benefits listed above, athletes regardless of age, level of competition, sporting activity, or ability need to be supported and afforded certain rights. Athletes' are also, however required to meet certain obligations and responsibilities in order for all involved to benefit fully from their sporting pursuits. It is therefore, essential that athletes operate professionally and with integrity both on and off the field and in their relationships with those who participated in or associated with their sport. To create an enabling environment as policy makers, to understand the requisite traits and strategies that have successfully sustained athletes in running positions and performance improving is one of the principles of the countries and

detailed in the country's Plan of Action. Strategies for sport and youth's Affairs Ministers' to present unique insights offered by decision sciences and international research on athletes in or aspiring for strengthening positions should sets out the business background. Sport training involves many subjects, but most importantly the athlete and the coach are the most important individuals in the way of increasing training performance of the athletes (Erin C. White, 2009)

Now days in Ethiopia, the public assumption is remarkably high in visualizing the future success in more steps-up in discus and javelin throwing events of athletics. Needless to say, it is not possible to dwell entirely up on the past success which has gone to the record books, instead on what is successfully being done today. Hence, active engagements with the current practice provide us fresh looks-- to see the far prospect. On the top of that, the retrospect footpaths do play a significant role on the overwhelming majority of youths in making them to be the part of the history. In amhara region, athletics sport specially in the field event, the regional youth sport office it cannot be give equal emphasize in financially and also to be design competition program to compare with track events. For this reason the researcher has inspire to conduct the study to investigate with determinant factors that influence discus and javelin thrower performance which is encounter in some part of the amhara national regional state athletics sport club.

1.2. Statement of the problem

In the fast change world, the increase in public expectation from sport sector creates changes in the sport policy. Consequently, this change would have effect on the javelin and discus throwing sport fields. So, in order to keep with this abreast changes, the organized athletics sport clubs in many sport activities have become the call of the day. In line with this, Ethiopian National Sport policy has been experiencing reforms in different depth and width clearly focusing in training talented youths a cross the threshold based on the club, to produce elite athletes with various fields of athletics including specifically discus and javelin throwing events that the country is not yet well known (ENSP, 2004).

In conformity to this, ENSP(2004) further disclose and puts ,"…register great achievements of international standard by tapping the overall sports activity within the community and in

particular from among the youth by creating awareness and participation amongst them‘‘‘‘ To this effect, appropriate implementation of the program can favorably influences the overall development of the countries sport in many aspects. To happen and see as expected: talents identification, proper recruitment procedures, interest of athlete and coach, skill gap concerning to the event, research, scientific based training, setting within reachable goals, competent and effective organizational structure are precondition, as Sharkey (1986) agreed.

In the field of coaching the researcher would have seen profusion of talented and physically well improve athletes are clearly observed in the amhara national regional state athletics sport clubs. Because of that the researcher initiated to study throwing event specifically javelin and discus.

The researcher was observe the physical fitness qualities and technical aspects of the thrower and compared with the western athletes mostly they are far. However, in case of morphological structures or anthropometric variables such as height and weight mostly they have been nearly similar. In some extent strongly varies in according to technical aspects specially power position, delivery phase, upper limb speed (release velocity), muscular strength and bon size.

The researcher viewed that in fact not only the club owners and concerning stakeholders, managers and the regional state athletics federation as well as at the Ethiopian national sport federation (ENSF) level which could not have offer equal attention and concentration for discus and javelin thrower athletes just like other long distance running event, even to design the competition program and again they don’t have necessary throwing event sport facility, alternative throwing training field and there is no adequate and efficient training facilities ,standardize gymnasium materials and equipment.

So that researcher believe that because of the fact throwing event such as discus and javelin throwing athletes they did not go far like other long distance running event in the history of Ethiopia, even in the country level we didn’t have naming or model athletes that compete at the Olympic standard and also they could not have brought about the Olympic minima. But Ethiopia has been dominated in the long distance race as the begging of Abebe Bekela he

was run on bare foot at Rome 1960 won gold medal, up to now we are winner in the long distance race.

However, the researcher argument focus on the fact that Ethiopian throwing event athletes such as javelin and discus would repeat like what has been achieved by track event and road race athlete's". Provided that the journey of throwing event athletic preparation is conducted under well organized and worked together in harmony and smoothly with all club owners and respective stakeholders. Again, it is necessary to repeat at this stage that from well-organized structure of athletics training sector and adequate training method have a great deal is anticipated in order to keep and continue the achievements in more steps-up under the fields of throwing athletics. Ultimately, the researcher found out that timely and crucially to see the basic questions: what are the major determinant variables influence javelin and discus thrower athletes' performance.

1.3. Basic research question

The study would be guided by the following basic research questions

1. What are the major factors potentially influence discus and javelin thrower athletes' performance?

2 .Are coaches and athlete's having interest and commitment to participate the discus and javelin throw?

3. Is the plan designed clearly for achieving athletes training goal?

4. Is their clear relationship discussion and communication between coaches and athletes for achieving their objectives and goals?

5. Are coaches and trainees having proper knowledge, skill, technique and attitude for achieving discus and javelin throwing performance?

6. Are there enough available sport facilities and equipment related to the field?

7. Does the club coach and other concerned stakeholder's conceder physical fitness, anthropometric measurement and talent identification during athletes' selection?

1.4. Objective of the study

1.4.1. General objective

The main purpose of the research was to investigate the major determinant variables that influence discus and javelin thrower athletes' performance in four amhara national regional state athletics sport club and find out clear practical solution.

1.4.2. Specific objective of the study

1. To identify determinant variables that influence discus and javelin athletes' performance.

2. To examine the level of interest and commitment of trainees, coaches and other related sport stakeholders.

3. To evaluate the training program and plan with related to achieving their performance.

4. Assess the level of communication and integration of work between coaches and athletes concerning their goals and objectives.

5. To assess the level of skill, knowledge, technique gap of trainees and coaches in the field of discus and javelin throw.

6. To identify the availability of necessary sport facilities, equipment and standardize gymnasium material this is contributing to the performance of the trainees.

7. Identify the impacts of physical fitness, anthropometric measurement and talent identification on throwing performance.

1.5. Significance of the study

It is hope that the findings of this study have provided the following key benefits:

It benefits of the outcome of the research it may be initiated the sport organization, athletics sport federation, officials, coaches, athletes, managers other concerned stakeholders to pay attention the discus and javelin throwing event and it can provide possible problem identification in order to improve throwers performance. Moreover, this study may have offer special opportunity who may wish or to conduct further and in-depth investigation on the issue. Finally the research may initiate other trainee to conduct the throwing event.

1.6. Definition of terms

Aerodynamic; is calculated from the difference between the official distance and the vacuum flight distance and the lost distance **(Hay & Yu, 1995).**

Anthropometry: involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape.

Athlete/thrower/trainees: -is someone who is good at sport, especially athletics, and takes parts sports competition **(Encyclopedia**).

Athletics: - track and field event sport comprises a group of athletic events or disciplines, each of which involves walking, running, throwing and jumping **(IOC, 2010).**

Coach–is a professional head of the team who is responsible for the preparation performance of single player or a teams as whole **(Johan et al. 2008).**

Coaching: -is often used to cover wide range of activates; usually to help someone Prepare for something **(Martens'., 1997).**

Delivery phase: is defined as the time between the left foot touching down and the release of the javelin and discus.

Power position: is defined as the time between the right foot touching down and the left foot touching down**.**

Release speed: is the absolute magnitude of the velocity vector of the center of mass of the javelin at the palm of aerodynamic flight.

Recruit: - it is a systematic ways of selecting an athlete based on his/her performance.

Release Angle: – It is the angle between the right arm and the horizontal ground made at the time of releasing the discus and javelin. Release angle and speed of throw are inversely proportional to each other.

Training: - is a systematic process with the objective of improving athlete fitness or performance in selective activity **[peter j l Thompson].**

Training principles:-are the guidelines govern human beings to develop physical, mental, intellectual, emotional, psychological and spiritual performance response to implement training as a product of that intelligence.

1.7. Delimitation of the Study

The study would be delimited only in three amhara national regional state athletic club and one athletic training center to make it easily resolve problems that are encounter major determinant variables influence discus and javelin throw performance. Since the researcher would be focus on the major determinant variables influence discus and javelin thrower performance.

1.8. Limitation of the Study

The study has been limited number of throwing athletes for the validity of the research and lacks of clear and relevant reference book, poor research experience, lack of review literature other journals primary source of magazine, article, and shortage of time.

1.9. Organization of the study

This research paper is organized in to five chapters. Chapter one deals with the background of the study which includes statement of the problem, basic questions of the research, objectives of the study, significant of the study, scope of the study, limitation of the study definition of terms and organization of the study. Chapter two deal with all about review of related literature. Chapter three research designs and method with detailed explanation on procedures of sampling techniques, instrument of data collection are included. Chapter four presents findings, interpretation and analysis of the study. The final chapter expresses a brief summary, conclusion and recommendation. Finally bibliography, sample questionnaires, sample interview questions, observation another relevant documents are attached to the last part of the thesis.

Chapter two

2. Literature review

2.1 Aerodynamic distance

2.1.1 Release variables

The javelin is the most aerodynamic of all the field event implements, therefore, aerodynamic forces must be included in any evaluation of performance. A javelin is five times more aerodynamic than a discus, and 500 times more aerodynamic than a shot or hammer (Hubbard, 1984). The javelin itself is a spear consisting of a solid or hollow smooth shaft made of metal, usually aluminum or steel, or carbon fiber, with a metal head that must have a sharp point, and a cord grip wound around the center of mass. In 1984 a men's javelin throw world record of 104.8 was achieved, and in 1986 the javelin specifications were changed to reduce the distances thrown and increase the likelihood of a point first landing. These changes primarily affected the aerodynamic distance (Hubbard, 1984). Similar changes were made for the women's implement in 1999.

The center of mass of the javelin was moved forwards in an attempt to cause the javelin to pitch forward in flight, and the minimum radius of the tail of the javelin was increased, thereby increasing drag forces (Hubbard, 1984). These new rules javelins must be a minimum of 260 cm long with a minimum mass of 800 grams for men, and a minimum of 220 cm long with a minimum mass of 600 grams for women. The center of mass of the men's javelin must be between 0.9 meters and 1.06 meters from the tip. The center of mass of the women's javelin must be between 0.8 meters and 0.92 meters from the tip. Strict rules govern the construction and dimensions of the javelins (IAAF, 2009).

2.2. The relation between technique, release variable and aerodynamic distance

Athletes' throwing techniques result in the release variables that principally determine the aerodynamic distance. The aerodynamic distance is calculated from the difference between the official distance and the vacuum flight distance and the lost distance (Hay & Yu, 1995). The release variables that are used to calculate vacuum flight distance are the release speed, release angle, release height, and acceleration due to gravity. The release speed and the release angle are also determinants of aerodynamic distance (Hay & Yu, 1995). Aerodynamic flight is complicated, however, and further release variables influence aerodynamic flight.

The release variables of the angle of attack, the angle of sideslip, the inclination angle, the yaw angle, the pitch rate, the yaw rate, the spin, and vibration of the javelin at release have a great influence on the lift and drag forces that act on the javelin, and the aerodynamic distance, but are not used in the calculation of vacuum flight distance (Hubbard, 1984). The aerodynamic characteristics of the javelin, such as its mass, shape, surface area, principal moments of inertia, lift and drag coefficients, and projection area also influence the lift and drag forces and the aerodynamic distance (Hubbard, 1984).

Aerodynamic distance is determined by the release speed, the release angle, the inclination and direction angles of the javelin, the angle of attack, and the yaw angle, the angle of sideslip, the pitch rate, the yaw rate, the spin, and the vibration of the javelin at release. The release speed is the absolute magnitude of the velocity vector of the center of mass of the javelin at for aerodynamic flight, this speed should be referenced to the wind vector (Hubbard, 1984), and however, in most studies wind speed and direction are not investigated, and are assumed to be zero. The release speed, then, is the speed of the javelin relative to the lens of the camera.

2.2.1. Javelin throwing technique

Javelin throwing technique has evolved for optimal performance, which is throwing as far as possible. Javelin throwing performance was determined by how far the javelin was thrown from the runway into the field (IAAF, 2011). This was known as the official distance, which was defined as the distance between the nearest landing mark of the javelin in the throwing sector and the inside edge of the throwing arc along a straight line connecting the landing mark and the center of the throwing arc (Hay & Yu, 1995; Leigh, Gross, Li, & Yu, 2008).

The official distance was divided into three partial distances: the vacuum flight distance, the aerodynamic distance, and the lost distance (Hay & Yu, 1995; Leigh, et al., 2008).

2.2.2. Vacuum flight distance

The vacuum flight distance was the greatest partial distance, it was defined as the distance thrown without regard for aerodynamic effects, and it was principally determined by the release speed (Bartlett, 1988; Best & Bartlett, 1986; Hay & Yu, 1995; Hubbard, 1984; Hubbard &Alaways, 1987; Morriss& Bartlett, 1996).

2.2.3. Aerodynamic distance

The aerodynamic distance was the second greatest partial distance, it was defined as the gestalt distance travelled due to aerodynamic effects, and it was strongly related to the orientation of the release of the javelin (Hay & Yu, 1995; Hubbard, 1984; Hubbard &Alaways, 1987; Hubbard & Rust, 1984).

2.2.4. Lost distance

The lost distance was defined as the distance thrown for which the javelin thrower was not credited, and had relatively minor effects on official distance (Hay & Yu, 1995). The performance measures for javelin throwing, therefore, were the official distance, the release speed, and the aerodynamic distance. To achieve maximum official distance, a javelin at release must have the optimal release characteristics for maximum theoretical vacuum projectile motion, as well as for beneficial aerodynamic effects (Best & Bartlett, 1986, 1987; Best, et al., 1996; Hubbard, 1984; Hubbard &Alaways, 1987; Rich, et al., 1985; Terauds, 1974b; Vitasalo, Mononen, &Norvapalo, 2007).

Vacuum projectile motion was measured by the vacuum flight distance, which is the primary partial distance of the official distance. It was defined as the distance travelled by the javelin as if it were a point mass in a vacuum as calculated by the range equation from release speed, release angle, and release height (Hay & Yu, 1995; Hubbard, 1984).

2.2.5. The release speed

Was defined as the magnitude of the release velocity, which is the velocity of the center of mass of the javelin at the instant of release (Bartlett, 1988; Best, et al., 1993; Hay & Yu, 1995; Morriss& Bartlett, 1996).

The release height was defined as the vertical distance above the runway of the center of mass of the javelin at the instant of release (Hay & Yu, 1995; Morriss& Bartlett, 1996.The release angle was defined as the orientation of the release velocity relative to the forward throwing direction in a vertical plane defined by the true vertical axis and the axis pointing along the longitudinal axis of the javelin (Bartlett, 1988; Best, et al., 1993; Hay & Yu, 1995; Morriss& Bartlett, 1996).

2.2.6. Optimal release

The optimal release characteristics for vacuum flight distance were determined as a release with a great release velocity at a suitable angle (Bartlett, 1988; Best & Bartlett, 1986; Best, et al., 1993; Hubbard, 1984; Hubbard &Alaways, 1987; Morriss& Bartlett, 1996; Rich, et al., 1985; Terauds, 1974a; Vitasalo, et al., 2007). The aerodynamic effect was measured by the aerodynamic distance, which is the secondary partial

distance of the official distance. It was defined as the difference between the official distance, the vacuum flight distance, and the lost distance (Hay & Yu, 1995).

The aerodynamic distance was primarily determined by the direction of the javelin relative to the velocity of the javelin (Hubbard, 1984; Morriss& Bartlett, 1996), which depended on the angle of attack and the angle of sideslip.

2.2.7. Angle of attack

The angle of attack was defined as the angle between the release angle and the orientation of the javelin relative to the forward throwing direction in a vertical plane defined by the true vertical axis and the axis pointing along the longitudinal axis of the javelin (Bartlett, 1988; Hubbard, 1984; Morriss& Bartlett, 1996).

2.2.8. Angle of sideslip

The angle of sideslip was defined as the angle between the yaw angle and the orientation of the javelin relative to the forward throwing direction in a horizontal plane parallel to the ground, and was defined by an axis pointing along the midline of the throwing sector and an axis pointing to the left of the runway (Bartlett, 1988; Hubbard, 1984; Morriss& Bartlett, 1996).

2.2.9. Yaw angle

The yaw angle was defined as the orientation of the release velocity relative to the forward throwing direction in the horizontal plane parallel to the ground, and was defined by an axis pointing along the midline of the throwing sector and an axis pointing to the left of the runway (Bartlett, 1988; Morriss& Bartlett, 1996).

The lost distance was the third partial distance of the official distance. It was defined as the distance for which the athlete did not get credit, because they released behind the foul line or the javelin travelled along a path longer than was measured by the meet officials (Hay & Yu, 1995).

It had relatively minor effects on official distance, and was minimized by releasing as close to the foul line as possible (Hay & Yu, 1995). The optimal release characteristics for javelin throwing were determined to be a release at a suitable angle with a great release velocity, and a precise direction of the velocity relative to the ground and to the javelin (Best & Bartlett, 1986; Hubbard &Alaways, 1987; Morriss& Bartlett, 1996; Terauds, 1974a). This approach was found to maximize the performance measures of javelin throwing, which were the release speed, the aerodynamic distance, and the official distance.

2.2.10. Performance and technique

Studies that have reported the optimal release characteristics have not investigated how those release characteristics may be achieved. Eight javelin studies have looked at associations between javelin throwing performance and technique (Ariel, 1973; Best, et al., 1993; Gregor& Pink, 1985; Komi&Mero, 1985; Kunz & Kaufman, 1980; Liu, Leigh, & Yu, 2010; Morriss& Bartlett, 1996; Terauds, 1978). Studies that have considered runway speed (Komi&Mero, 1985), progressive upper extremity motion (Ariel, 1973; Morriss& Bartlett, 1996; Terauds, 1978), and timing (Liu, et al., 2010) as variables that may influence official distance found no association between technique and performance.

Only backwards trunk tilt has been determined as a kinematic variable that has an influence on javelin throwing performance (Kunz & Kaufman, 1980). There was a need, therefore, to explore the factors that may have underlain javelin throwing performance, and to identify specific movement patterns that may have influenced performance. This information would be of direct use for practitioners – primarily coaches and athletes.

Javelin throwing technique is complicated and demanding (Ariel et al., 1980&Terauds, 1980; Bes et al1996; Morriss& Bartlett, 1996; Terauds, 1985). A javelin thrower makes complex, multi-joint movements that require great muscular strength, sophisticated coordination, and accurate control (Limpisvasti et al., 2007; Wilk et al., 2000). These movements must develop the great forces that are necessary to accelerate the javelin to great release speeds (Bartionetz, 2006; Bartlett, 1988; Wilk, et al., 2000), while carefully controlling the direction of the release (Bartlett, 1988; Best & Bartlett, 1986, 1987; Ganslen, 1967; Hubbard, 1984; Hubbard &Alaways, 1987; Rich, Whiting, McCoy, &Gregor, 1985; Terauds, 1974a, 1974b).

The generation of great forces exerts significant musculoskeletal stress on multiple joints (Andrews &Fleisig, 1998; Boden et al., 2000; Griffin, & Garrett, 2000; Fleisig et al., 1995; Limpisvasti, et al., 2007; Werner, Joneido, & Brunet, 2006; Wilk, et al., 2000).

2.2.11. The current practices of javelin throw

which consists of: (1) an approach run where the thrower runs forwards towards the throwing direction to build up momentum, (2) a series of crossover steps where the thrower runs sideways and stretches their trunk and throwing shoulder muscles, (3) a single-support phase where the thrower transitions from a running to a throwing motion, (4) delivery phase where the thrower comes to an abrupt stop, transfers runway momentum to javelin speed, and releases the javelin in an over-arm throwing motion, and (5) a

follow through where the thrower decelerates their throwing motion and regains their balance. (Babbitt, 2001; Bartlett, 1988; Gorski, 2003; Morriss et al., 1996). The single support phase was defined as the time between the right foot touching down and the left foot touching down (single support phase). The delivery phase was defined as the time between the left foot touching down and the release of the javelin (delivery phase). The throwing procedure was defined as the single support phase and the delivery phase together (Bartlett, 1988; Hay & Yu, 1995; Morriss& Bartlett, 1996).

2.3. Determinant variables for discus thrower

2.3.1. Technique and specific muscular strength training (SMST)

Discus throwing is one of a technical and physically demanding event in athletics that requires the athlete to perform high-speed rotational movements in a limited space (Dai et at, 2013). Factors that have been shown to predict superior performance include a large discus release velocity. Technical aspects that are shown to increase the release velocity are torsion between the hip, trunk, and shoulder, discus placement related to the body, and proximal-to-distal acceleration timing (Barlett, 1992; Leigh et al., 2008).

Another way to increase the release velocity is by the overload principle of either force or velocity to enhance the power of the athlete (Van Den Tillaar&Ettema, 2011). This can be done by either a-specific weight training or specific resistance training (SRT). In particular, SRT has been shown to improve athletic performance compared to non-sports specific weight training (Escamilla et al., 2000; Van Den Tillaar&Ettema, 2011). SRT uses weighted objects during the actual movement tasks (Szymanski, 2012).

However, it was also shown that throwing kinematics was highly sensitive to weight variation (Van Den Tillaar&Ettema, 2011). If the imposed resistance is inappropriate, it could have an undesirable influence on the athlete's technique (Escamilla et al., 2000; Lin & Chen, 2012). Furthermore, there may be an increased risk of injury when the loaded object does not fit the physical capabilities of the athlete (Escamilla et al., 2000). For this reason, SRT load should be adjusted for each athlete individually.

Although SRT is a commonly used training method for discus throwers, it remains unknown what the influence of either increased or decreased discus inertia are on discus trajectory in the delivery phase or athlete kinematics, which subsequently influence performance. As a result, it is possible that the utilization of SRT in discus throwing is not optimally applied. The aim of this study was to investigate determinant factors influences discus and javelin thrower performance. Discus and javelin release velocity and timing of

acceleration between the hip and sternum, where the timing of acceleration is a surrogate for the angle between the hip and trunk.

2.4. Effects of environment on aerodynamic flight

Environmental conditions, such as the atmospheric pressure, wind speed and wind direction, have no effect on the vacuum flight distance, but have a great influence on the drag and lift forces during flight, and therefore the aerodynamic distance (Hubbard, 1984). The aerodynamic flight of the javelin is a complicated concept. Considering the aerodynamic distance as representing all the complicated factors simplifies analysis and interpretation

Furthermore, the wind speed and direction change with altitude, so truly accurate measurements of wind need to consider a range of altitude, since the javelin reaches great heights as it flies. These measurements are very difficult to make, hence the assumptions of zero wind. In general, the velocity of the javelin is much greater than the wind speed, so the assumptions of zero wind speed may not have a great influence. Release velocities of 28 meters/second are common, which would be the equivalent of a storm force wind with a hurricane warning on the Beaufort scale.

2.5. Psychological and organizational variables

2.5.1. How stress influence performance

Stress comes in many forms, not all of which are directly related to competition performance. Many of the stressors an elite athlete faces do not come from the competition but rather come from the organization of the team he or she plays for (Mellalieu, Neil, Hanton, & Fletcher, 2009). This could be due to the possibility that athletes are acquainted with stressors that come within competition and because those stressors remain fairly constant.

Organizational stressors, however, can vary and remain inconsistent to both type and timing (Hanton, Wag staff, & Fletcher, 2012). Mellalieu et al. (2009) concluded that multiple organizational stressors affected athletes. One of the major stressors involved the playing environment and the organization of that environment.

The athlete's role within the organization of the team and the cohesiveness among players were also revealed to be stressors. In addition, the level of involvement from team management was found to add to an athlete's perceived stress (Mellalieu et al., 2009). Even though organizational stressors may not

continually worsen, they are regularly present and affect the athlete (Hanton et al., 2012). Mellalieu et al. (2009) also investigated the competition stressors faced by athletes. These included stressors such as being adequately physically prepared, internal and external expectations, an athlete's image, and the current opponents. Sustaining an injury was also a stressor to athletes as they have expressed concern over incurring a new injury, worsening an existing one, or feeling unstable at the site of an injury (Walker &Nordin-Bates, 2010).

2.6. Talent identification and performance

The most common and obvious way to identify athletic talent is to examine physical ability, but current research cautions against dimensional approach. As Simonton, 2001 notes that the idea that talent is a complex topic, stating that multiple components contribute to the development of talent in any domain. As Abbott et al, 2004 study denoted the importance of psychological skills in talent identification and development. They stated that **"**Athletes should not be excluded or identified based solely upon one attribute, such as height. Abbott and Collins maintained that other factors like speed and agility may compensate for a weakness.**"**

The authors claimed their approach to athletic talent identification and development acknowledges the difference between performance and potential: (a) Main emphasis should be placed on potential to develop rather than immediate performance; (b) one's potential to develop rests on psycho-behavioral components; (c) in order to develop in a sport, essential fundamental movement skills must be present in their vocabulary (psychomotor); and (d) talent identification and talent development processes should be combined.

2.7. Leadership of coach

According to Sullivan & Kent, (2003) Referred to the outcomes of coaching leadership style – instruction; democratic; autocratic; social support; positive feedback –is perceived to be part of coaching behavior. This is important to the extent that coaching performed adequately will result in the increase in the athlete's progress (e.g., skills, self-confidence). If a project does not have a leader, that project is likely to struggle in setting and, therefore, achieving goals. Furthermore, coaching efficiency is supported by the style of leadership that a coach adopts. It is necessary, however, to analyze the different perceptions of leadership among sports coaches. Leadership allows coaches to be more confident when motivating their players, and more efficient in doing their job.

Therefore, Athletics project without a strong leader as head coach may face problems in being considered

a successful project. Successful organizations are characterized for effectively conducting their internal processes – resulting in goal achievement. The adequate execution on these processes pertains to its members, in particular to the head of that organization.Therefore, the leadership process is essential for the "performance of the group and the satisfaction of the members".

2.8. Sport facilities and equipment

According to Ojeme, (2000), Having the right quality and quantity sports facilities and equipment is an integral parts of sports development. To a large extent, this is partly what makes the difference between the sports culture of developed and developing nations. In the developed world, sports facilities and equipment of the appropriate standard are available of promote the athletes performance. In support of this view**,** Talabi (1998) opined that most developing countries wish to arrive at the level of developed countries over night. While developed countries are putting so much into providing excellent facilities, equipment and conducive environment for athletes, developing countries seems to lag behind in the provision of these amenities and expect their players or athletes to excel in the international arena. Development countries are not paying enough attention to starting well so, ending up finishing badly or poorly.

According to Atoyebi (1992) stated that adequate planning and construction of facilities are necessary if performance and participation in inter collegiate sports program will be appreciated and enjoy good management. A few examples of such improved sports facilities include among others, synthetic and cinder tracks. Although adequate facilities are necessary for effective instruction in sports, it is the responsibility of the management to provide adequate space/facilities, equipment and personnel for the sporting program (Venkatewarlu, 2000). Sports Equipment Ladani (1990) observed that sport equipment can be said to represent the tools that the coaches and the participants must have or use to facilitate the coaching of sports and for competitions.

According to Aluko,(1999) The availability of adequate equipment and facilities play a major role in sports development. It would not be important to achieve satisfactory results from athletes, whose training facilities are inadequate or substandard which in actual fact will not compliment the work of the coach. Good sports program can function at full effectiveness only when they are supported with effective equipment in good conditions Athletes have come to realize that improved.

According to Awosika (1996) confirmed that facilities represent a sensitive area in all ramification of

sports management. They occupy an enviable position since their provision carries with them certain standards as determined by age, weight and experience of the user. He noted that the existing sports facilities in Nigerian institutions of learning are exceedingly inadequate and substandard.

According to Atoyebi (1992) stated that adequate planning and construction of facilities are necessary if performance and participation in inter collegiate sports program will be appreciated and enjoy good management. A few examples of such improved sports facilities include among others, synthetic and cinder tracks. Although adequate facilities are necessary for effective instruction in sports, it is the responsibility of the management to provide adequate space/facilities, equipment and personnel for the sporting program (Venkatewarlu, 2000). Sports Equipment Ladani (1990) observed that sport equipment can be said to represent the tools that the coaches and the participants must have or use to facilitate the coaching of sports and for competitions.

According to Ajayi (1994) supported that sports equipment and facilities should be provided in sufficient number so as to enable all students in the institution to participate actively in sports program. He saw lack of adequate equipment as lack of well-planned program of sports activities that are capable of providing for all round development of students. For this reason According to Umeiegbu (1981) reported that good sports program can function at full effectiveness only when they are supported with sufficient equipment in good condition. In other words, there must be adequate sports equipment in good condition for regular training and practice of athletes for intercollegiate sports.

According to Awosika (1996) maintained that inadequate facilities and equipment were consistently rated high as factors affecting both effective participation and performance in sports .Thus noting that equipment is very important in the management of sports in tertiary institution and opined that students should be exposed to real equipment and standard facilities so that they could see, feel and use the right material from the start.

2.9. Training methods

According to Ralph E. Steben and Sarnbell (1978), Track and field and administrative approach to the science of coach, one of the most important responsibilities of the coach is planning the athlete's training program. Planning is a long term process since elite athletes may not reach their full performance capabilities until 24 years of age or older. In this long term planning the coach usually looks at what the athlete wants to achieve for a particular year and divides this year into a number of periods. For younger,

inexperienced athletes performance targets may need to occur at more frequent intervals, such as the immediate season a head. This is because young athletes are often unable to work towards objectives that they think of as being too distant.

The term "per iodization' is used to describe the division of the training program into a number of periods of time. Each of these periods will have specific training objectives. The major objective of any plan is to bring the athlete to the most important competitions of the season, fully prepared and in a physical and mental state to perform at a level never previously achieved. Achieving optimum performance at the right place and time is called "peaking". Planning for the year or season a head is done backwards. The coach and athlete decide what, where and when the major competitions will be for the season a head. The next task is to work back in time through the early season competitions and the training periods until arriving at the beginning of the training year. All training plans should be simple and flexible as the plan will be modified according to the athlete's progress and improvements in the coach's knowledge and experience. What exercise of training activity will help achieve the individual's fitness goals? Plan the program in four week cycles where the work load in the first three weeks increase each week (easy, medium, hard) and the fourth week comprises of active recovery and tests to monitor training progress.

According to Jon Amunus etal (1995) foundation of track and field coaching manual describes that, the primary purpose of training is to improve and plan the performance of the athlete. The systematic application of skill instruction, biomechanics, and the principles of training to the development of track and field athletes is planned performance training. Planned performance training seeks to achieve maximum improvement in performance and is structured so that peak performance occurs at predetermined moments within the competitive season. That, after all, is the point of competition. Without such planning, the training of the athletes becomes haphazard and good results become a matter of happenstance rather than planning and prediction. The first requirement of successful planned training is assessment. A coach must evaluate the athletes and their abilities, the level of competition and the time available for training and competition. From this evolution, the objectives and goals for individuals and the team are defined. A set of expectations for the athletes establishes direction and purpose for their efforts. Expectations frame the goals the coach and the athletes will have for the season. At the same time though, goals must be realistic and open ended. Goals that are too grandiose only serve to discourage performance. Goals that do not evolve inhibit the unseen abilities of the athlete. Goals are most often achieved when accompanied by the true expectation of success.

According to Ralph E. Steben and Sarnbell (1978), the primary purpose of training is to improve and plan performance of the athlete. The systematic application of skill instruction biomechanics and principle of training to the development of track athletes is planned performance training. Planned performance training seeks to achieve maximum improvement in performance and is structured so that peak performance occurs at predetermined moments within the competitive season. That offer all is the point of competition without such planning. The training of the athletes becomes haphazard and good results become a matter of happenstance rather than planning and prediction.

2.10. The role of coach and its responsibility

Coaching In regards to performance stressors, coaches can play a critical role in preparing athletes with the ability to overcome mental obstacles. Coaches have the greatest amount of influence and responsibility for every aspect of the athletic program (Johnson et al., 2011). Differences among coaching styles through the characteristics of personality, knowledge, experience, communication skills, team leadership, and motivation methodology, can directly influence the same characteristics in the athletes (Barić&Bucik, 2009). Coaches who show sufficient knowledge in the technical skills of sport movements are better able to teach athletes correctly and decrease the amount of injuries from improper form and technique (Johnson et al., 2011).

2.11. Basic skills of coaching

2.11.1. Communication

Communication is one of the foundations of basic skills of coaching.

Another important factor in overall team performance is the ability of the coach to communicate. Coaches who do not communicate with the players, or who demonstrate poor communication skills, are more likely to mold athletes who feel less competent on the playing field. The athletes of these coaches also tend to maintain a business relationship rather than growing a personal, dynamic relationship with the coach (Barić&Bucik, 2009). Supporting and assisting with mental preparedness for game time is essential to the success of the team. An area of great interest concerning mental preparation is how a coach's leadership style influences self-talk in athletes. A study *(Zourbanos et al, 2010)* found that positive coaching environments correlated positively with positive self-talk. Positive self-talk is known to incorporate confidence, anxiety control, and competency. Positive self-talk–cultivated by positive coaching relationships–also correlates with improved individual performance. As leaders, coaches are the primary facilitator in enhancing program effectiveness, team relations, and group and personal performance

2.11.2. Developing basic skill of coaching

Tomass E. lerkinjr and Anita L.De Franz (2008, p19-36) Pointed out skills of coaching. It does not matter how much knowledge coach has, what & qualifications they hold or what other skills of coaching they posses.

2.11.2.1 Building relationship

If a coach can have build and develop effective relationships with athletes, he cannot be an effective coach. This should be the primary skill of coaching. Making the system smooth enables the athletes to do more. The coach should understand that each athlete expects a different amount of attention. Calling athletes by their name has a great significance; so a coach should, at the very least, know the name of each athlete that they are coaching.

Performance evaluation illustrated among the athletes and coaches. More effective coaches develop their knowledge as a foundation for the how they do their coaching. Effective coaches use their knowledge to meet the need of each individual. According to Tomass E, Larkinjr and Anita L.Defranz (2008), track and field coaching manual providing instruction and explanation is another basic skill of coaching. To provide effective instruction and explanation we have to keep flow of information.

2.11.2.2 Provide instruction and explanation

Most of the time instruction is given from the coach who is followed by explanation. In providing effective instruction and explanation we should always start by planning in advance what we are going to say. This should be a brief, clear & precise way to convey what we want. Athletes must be ready before the coach start speaking. Coaches need to do more on parents, partners, others coaches, officials, administrators and all the other people who are involved in athletics. Providing instruction &explanation is for the coach, giving or telling part of communication and is necessary for convey information.

2.11.2.3 Provide demonstration

Providing demonstrations is another skill of coaching; which involves a visual picture of technique or drill. Demonstrations can be used for a number of purposes. They may be used to introduce new skill. It may be use to motivate or inspire. It may be also used to illustrate a particular point. Demonstration has been shown to be a very important tool for helping novices in the first stapes of learning a new movement tend to very good at imitating the movement if they can see it demonstrated.

Demonstration must be accurate & appropriate. In the case of accuracy it provides correct image where as in the case of appropriate if focus on the level of athlete. Checking the purpose of demonstration is a good

way of ensuring that demonstration is the right coaching aid and also help to determine the type of demonstration required. Alive demonstration can be quickly organized viewed from different angles and can be adapted easily. Using video is very important thing in demonstration we can easily show the image. It can also provide a more accurate image that can be replicated over & over again without fatigue. Video can also used very effectively for providing feed back to both coaches and athletes.

2.11.2.4 Observation and analysis

Observation and analysis are crucial parts of skills of coaching. It helps as to know the real situation through observation & to justify the result through analysis. Accurate observation provides effective results (Thompson, 2008).Observation and analysis becomes increasingly important as the coaches skills develop with relation to biomechanical principles develop. Focusing on a phase or body part can assist observations whether it is a novice or not observation by identifying the phases and also the motion. Technical models may include breaking down of the action to improve the observation biomechanical principles that permit the athlete to develop optimum force & specific coaching points & tips on what to observe.

All this information assists our observation and analysis (Thompson, 2008).Providing feedback is the most recommended & significance part of skills of coaching. Feed back is essential to learning. Without feedback the athlete will not know where to focus their attention to improve their performance feed backs in athletics will be originate from two main sources. Thus, naturally available feedbacks and additional feed – backs that are providing by external party (Peter JL Thompson, 2008).

2.11.2.5 Provide feedback

Both types of feedback are important and their relatively importance depends partially on the stage of learning of the athlete. At the initial stage of learning the athlete does not have a clear idea of what the move men should look & feel like. Giving constrictive feedback has a great value to improve the performance of the athlete. Taking the feedback as a strong side enables the athlete to be effective in a short period of time. Common understanding between an athlete and coaches will help the athletics to be more effective and accomplish the goal of the federation (Peter JL Thompson,

Chapter three

3. Methodology

3.1. Research design and methods

This section of the thesis deals with the research design, data source, population size and sampling techniques. It also presents the instrument of data collection and methods of data analysis.

In order to have a clear picture about the determinant variables that influence throwing athlete's performance, the researcher so as to use descriptive survey design approach.

3.2. The Research area

The study is conducted in four amhara national regional state athletics sport club, which is found in different areas in the region those are the trite corporate athletics sport club, guan auskod athletics sport club, abikut athletics sport club and Debreberhan training center. Furthermore the researcher mainly concern on this specific area which is determinant variables influence discus and javelin throw athlete performance.

3.3. Research design

This study would be used descriptive survey design. The descriptive statistics have been used to describe the existing situation of amhara region athletics sport club by percentage, table, pi-chart, frequency and bar-chart the data obtained through questioner, deep interview, observation and document analysis.

3.4 Research method

In order to attain the objectives of the research valuable the researcher used both quantitative and qualitative data by using various data gathering tools to obtain for relevant information; intensive review of related literatures is made to support the study.

3.5 Source of data

The researcher uses: primary and secondary source of data. Primary source of data were obtained from the subject as the form of questionnaire, interview, observation and document analysis. The secondary data were taken from different articles, journals, documents, thesis, magazines and different books.

3.6. Population of the study

The total population of this study would be 23 male and female javelin and discus thrower athletes, in addition to that two managers and two coordinators and nine coaches include in the study area.

3.7 Sampling size

The study would involved those Athletes who were participating in discus and javelin throw in amhara national regional state athletics sport club, coaches and club coordinators and managers. The total sampling size for the study is 23 trainees &nine coaches, two club managers and two coordinators would be participated. The researcher would be used 6 discuses, 6 javelin male thrower and 5 discus, 6 javelin female thrower samples from the trainees and the 9 male whole coaches, 2 male managers and 2 coordinators.

3.8 Sampling technique

The researcher would be used only census sampling technique because of the number of population to be low and the nature of the research could be restricted the sampling technique. Purposive sampling method would be used to select trainee respondents; moreover the study area such as trite corporate, guna awuscod, abikut and D/b athletics training center and coaches of the club will be selected by purposive sampling techniques.

3.9. Data collection tools

The instruments used for data collection questionnaires; interviews, observational checklists and document analysis would be carried out.

3.9.1. Data collection procedure

3.9.2. Pilot study

Researcher would be used pilot study of the current performance of javelin and discus thrower athlete's in four athletics club. From four athletics sport club eight athletes, four coaches and two coordinators were involved in the pilot study. In the pilot study, data gathering was carried out immediately after designing the two sets of questionnaires in order to verify their validity. In order to ensure the validity and reliability of the instruments, the following measures were taken.

1. The questionnaires were tried on four athletics club for eight athletes, four coaches and two coordinators were participated in the pilot study.

2. The respondents who participated in the pilot study were not included in the main study.

3.10. Data analysis

3.10.1 Correlation analysis

The data can be analysis by SPSS, which is highly advanced statistical analysis method. The Bivariate Correlations procedure computes Pearson's correlation coefficient, with its significance levels. Correlations measure how variables or rank orders are related. Pearson's correlation coefficient is a measure of linear association. Two variables can be perfectly related, but if the relationship is not linear, Pearson's correlation coefficient is not an appropriate statistic for measuring their association. This model needs continuous variable and it is used to examine the bivariate association of the improvement of throwing performance and the set of predictor variables.

3.10.2 Multiple linear regressions

Multiple linear regressions explain the relationship between two or more independent variables and a response variable by fitting linear equation.

The general formula for multiple linear regression models of p-explanatory variables is defined to be:

$$Y_i = \boldsymbol{\beta}_O + \boldsymbol{\beta}_1 X_1 + \boldsymbol{\beta}_2 X_2 + \boldsymbol{\beta}_3 X_3 + \ldots\ldots\ldots\ldots\ldots + \boldsymbol{\beta} p X_P + \boldsymbol{\mu}_i$$

Where Yi ⟶ dependent variable (effectiveness of athletics project)

X'S ⟶ independent variables

β_o ⟶ is constant parameter

β's ⟶ are coefficient parameters

μ_i ⟶ residual due to measurement error

II Assumptions of multiple linear regressions

1. Var ($\acute{\varepsilon} i$) =δ^2, the error term should have constant variance (homoscedasticity)

2. The error term is independently and identically distributed random variable having normal distributed with mean 0 and variance δ^2 i.e. it distribute N (0, δ^2)

3) X's -are independent (no Multicolinearity) each other.

4. Explanatory variables and error term are uncorrelated.

5. There is no autocorrelation between error terms.

I. Estimation of model parameters

The most popular method of estimating the multiple linear regression parameters (β) is least square method. Least squares method is a method that obtains an estimate of β which minimizes the sum of square deviation of the observed values of the dependent variable (Y) from its function E(Y) = X β.

Hypothesis testing

1. Test of overall model parameter

The overall goodness of the model (the model is not significant) vs H1: at least one different from zero (the model is significant)

Step 2: Specify α level of significant

Step3: Test statistics

$f_{cal} = MS_R/MS_{RES}$, where MSR=the regression mean square with p-1 degree of freedom, MSE=mean square of error with n-p degree of freedom,

Step 4: Decision: If $f_{cal}>f_{tab}$ or p value <α then Ho will be rejected at a given significance level.

Step 5: give conclusion based on the above decision.

2. Test of individual parameter

Step 1: Ho: βi=0 vs. H1:ßi≠0. i=1, 2, 3……p

Or Ho: the variable has no significant effect on the response variable

H1: the variable has a significant effect on the response variable

Step 2: Specify α level of significant

Step3: Test statistics

For Small sample (n<30),

Step 4: Decision $t_{cal} > t_{tab}^{n-p}$ or p value $< \alpha$, then reject Ho at a given significant level (α)

Step 5: give conclusion based on the above decision

Chapter four

4. Analysis of results and discussion of findings

4.1. Over view

In this chapter, the results of the study were presented and discussed in detail to address the objectives of the research. The purpose of research to examine the determinant variables influences discus and javelin thrower performance. In the previous Chapter Data were captured, processed in a structured form, for analysis and interpretation. This chapter focused on the findings from the literature, as well as the empirical investigation based on processed data and guidelines.

4.1.1. Description of demographic data

The total of 36 questionnaires were distributed to trainees were to the selected 4 athletics club for its reliability and all were analyzed. Accordingly four demographic variables of the respondents were gathered as background information. These are sex, chronological age, educational back ground, and training age. These characteristics of the respondents are summarized in Table 2 and 3 respectively. Besides all returned questionnaire's responses from selected subjects/trainees were analyzed and discussed. They are displayed from table 5- were also discussed for their reliability.

Table 1, Demographic Characteristics of Respondents (Trainees)

Item		frequency	Percentage
Sex	Male	12	52.17%
	Female	11	47.83%
	total	23	100%
Chronological age	18-23	13	56.52%
	24-28	10	43.48%
	Total	23	100%
Educational background	1-4	-	-
	5-8	9	39.13%
	9-12	14	60.87%
	total	23	100%
Training age	Below 1 year	2	8.7%
	2-4 year	12	52.17%
	5-7 year	9	39.16%
	total	23	100%

According to table 1, Regarding to sex distribution of the respondent is concerned, there is t little number of difference distribution between male and female athletes in the club. Accordingly male ranked 12(52.17%) and female 11(47.70%) as indicated in the table. Therefore, one can assume that the participation of both female and male athletes in the athletics club in the training areas is almost equal and no more gender difference was observed.

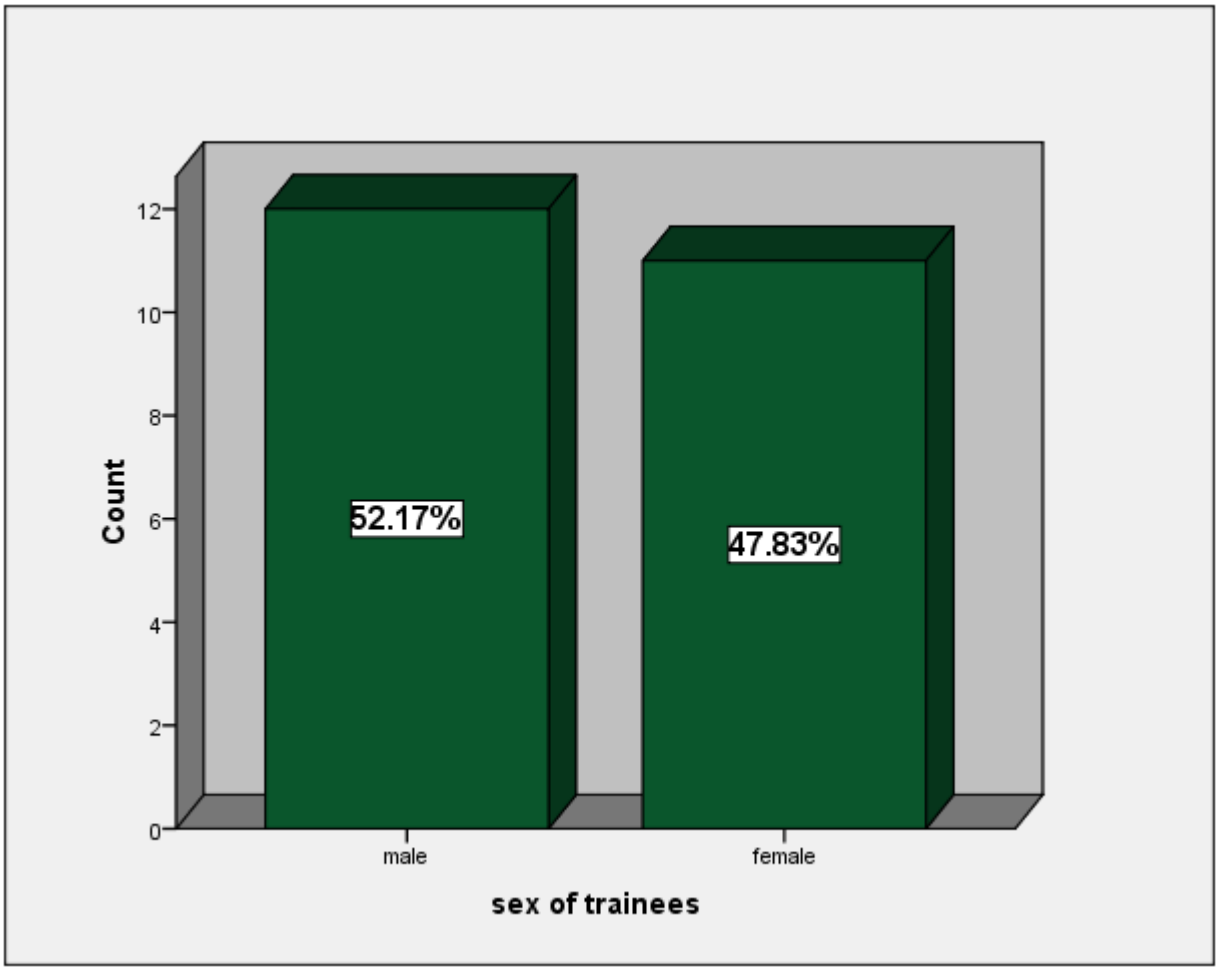

Figure 1 sex of trainees

According to chronological age also indicated that the respondents 13(56.52%) were in the range between 18-23 years and 10(43.48) were also in the age of between 24-28 years. This shows that in all club athletes they are well qualified to take and hold overload proper training , because that they were in the appropriate age for the training.

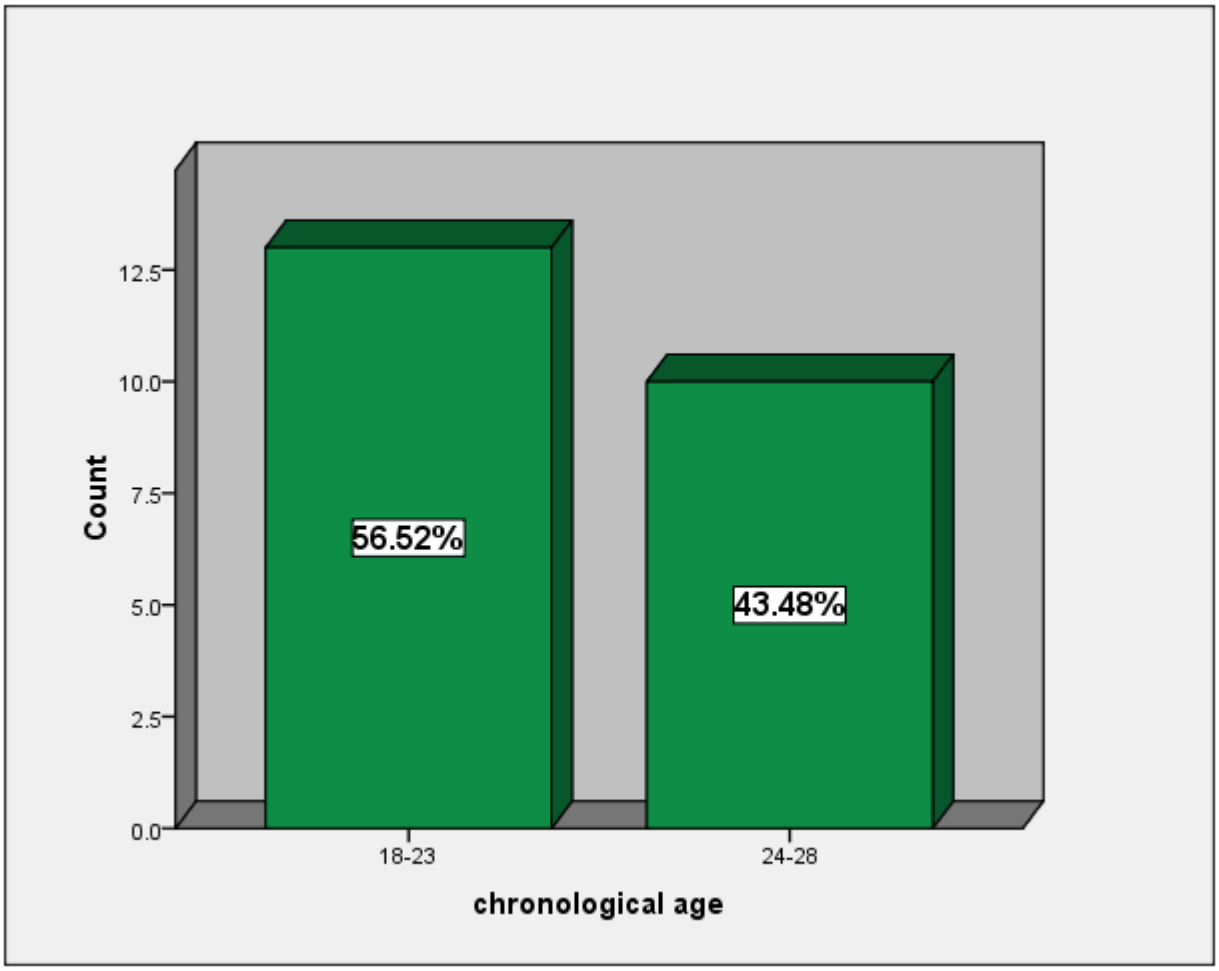

Figure 2 chronological age

As have seen from figure 2 and table 1, all participants were eager, energetic and force full and that found in the right place and the right time for the sport and have hope for the national team in the recent and that they contribute their potential for better achievement of their institutional goals for which they joined to train and excel in sport.

When the study of the educational background was done on the trainees involved in the survey were 9(39.13%) first cycle students and 14(60.87%) were second cycle students. The chart shows that the descriptive statics of the athletes educational background.

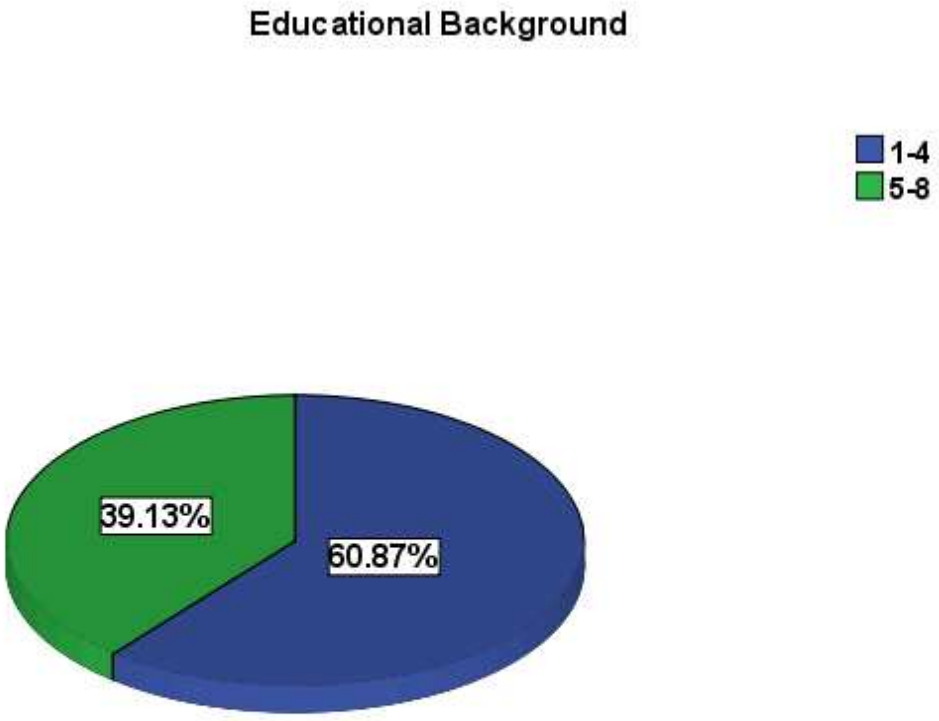

Figure 3 educational background

As observed from the descriptive statistics and pie-chart the educational states of the athletes they are not good enough in addition to that in training age also short. So that all club athletes they need to be adjustable quality education for the better achievement of their performance and to compete at the national level of standard.

Finally, Table 1 describes the extent of training age of the trainees were reported in the 2(8.7%) of respond are below 1 year, 12(52.17%) of respond are between the training age of2-4 and 9(39.13%) of respond that are between 5-6 training age. This implies that athletes predominantly they need to be additional training age for the better experience of their performance and to compete at the national level of standard.

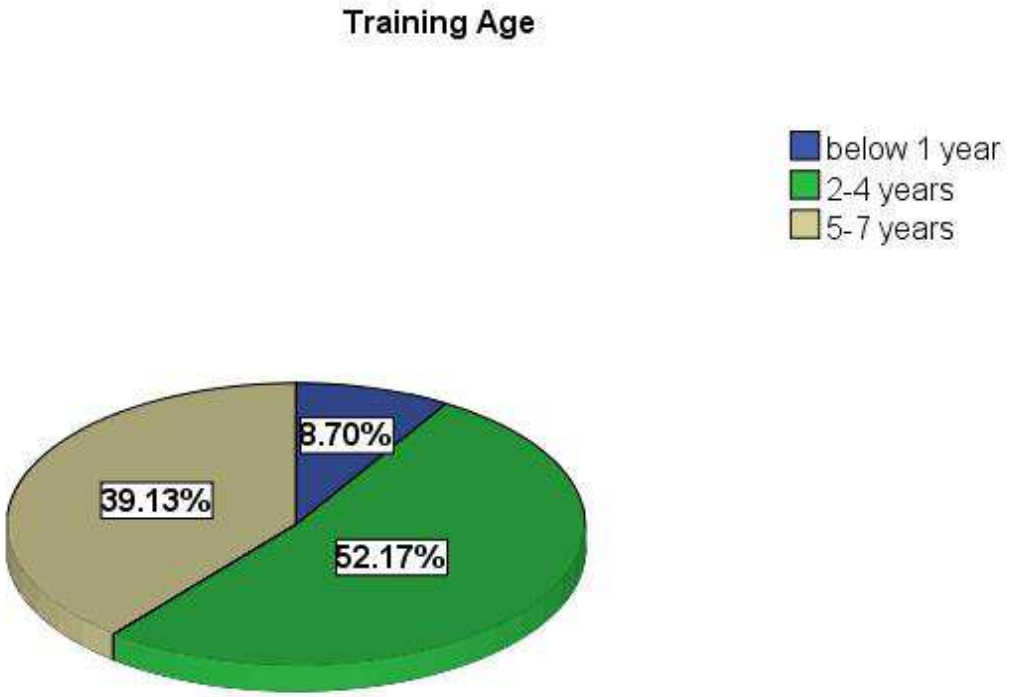

Figure 4 training age

Table 2 Demographic characteristics for (coach, managers and coordinators)

Items		Respondents					
		Coaches		Managers		Coordinators	
		F	%	F	%	F	%
Sex	Male	9	100	2	100	2	100
	Female	-	-	-	-	-	-
Age	21-30	3	33.33	-	-	-	-
	31-40	6	66.67	2	100	2	100
	41&above	-	-	-	-	-	-
Qualification	Msc in sport	2	22.22	-	-	2	100
	Degree in sport	6	66.67	2	100	1	100
	Diploma in sport	1	11.11	-	-	-	-
	Grade 10-12	-	-	-	-	-	-
Leadership experience	1-5yrs	4	100	2	100		
	6-10yrs	-	-	-	-	2	100
	11&above	-	-	-	-	-	-
Coaching experience	Below 1yr	-	-	-	-	-	-
	1-5yrs	6	66.67	-	-	-	-
	Above5yrs	3	33.33	-	-	-	-

According to table 2 sex distribution of the respondent was concerned in gender distribution, all coaches, coordinators, and managers were males but females were not involved on the club. This assures that there was clear gender inequalities in the coaching, and managerial position in the study area. Regarding to the respondents, 3(33.33%) of coaches only were between (21-30) years of age and 6(66.67%) coaches, 2(100%) of club managers and 2(100%) coordinators were between (31-40) years of age. From this, it is possible to conclude that all coaches, managers and club coordinators were matured to coach and coordinate and administers the athletics of the club in well organized manner.

According to the above table 2, 2 (22.22%) the coach had Msc degree, 6 (66.67%) of them had Bachelor degree holder and 1(11.11) diploma. Similarly regarding the respondents of the club coordinators,

2(100%) of them were second degree holder and the 2(50%) of club manager had first degree holder. From this, the researcher can conclude that coach, club coordinators and managers were highly qualified in education. So that this has been good opportunity for the development of athletics sport in the organization as well as at the national.

Eventually, Table 2 describes the extent of leadership experience of the club coordinators, managers and coaches of the athletics club. As reported in the table, all coaches 9(100%) and managers 2(100%) of them had 1-5years leadership experience and 2 (100%) of them club coordinator had 6-10 years of experience, whereas 6(66.66%) of coaches had 1-5 years' coaching experience in the club and, 3 (33.34%) of the coaching experience of the coach was above five years. From these results, it is easy to summarize all most all club managers and coaches had some leadership experience and also all coaches had the same leadership experience.

4.1.2. Data analysis of athletes

Table 3, Athlete response concerning on offering basic coaching knowledge, skill, technique and methods of training based on athletes performance with training age.

No	Response items	Category	Frequency	Percent
1	Methods of training concerned on athletes ability ,performance and training age	Strongly disagree	--	--
		Disagree	5	21.73
		Undecided	--	--
		Agree	13	56.52
		strongly agree	5	21.73
		Total	23	100
2		Strongly disagree	--	--
		Disagree	5	21.73
		Undecided	--	--
		Agree	12	52.17
		strongly agree	6	26.08
		Total	23	100

According to table 3, items 1 concerning to methods of training rely focus on athletes performance and training age, 5 (21.73%) of the respondents respond that disagree, 13(56.52%) of respondents told that agree and 5(21.17%) of respond that strongly agree. This result shows that half of respondents briefly replayed that they have gotten quality training based on performance and training age.

From table 3, items 2 coaching knowledge, skill and technique, 5(21.73%) of the respondents respond that disagree, 12(52.17%) of the respondent replayed that agree and 6(26.08%) of respond that strongly agree. The result shows that average, most of athletes responded that they have gotten appropriate knowledge, skill and technique.

Table 4, soft skills (their clear discussion and communication concerned on training plan.)

No	Variance	Category	Frequency	Percent
1	Clear discussion and communication concerned on training plan	Never	8	34.78
		Rarely	5	22.74
		Sometimes	4	17.39
		Mostly	6	26.08
		Usually	-	-
		Total	23	100

According to table no 4, concerning to clear discussion and communication on training plan,8(34.78%) of the respondents replayed that we never to clear communication and discussion on training plan,5(22.74%) of respond that rarely 4(17.39%) of respondents respond that sometimes we were communicate and discus with them . finally 6(%) of told that mostly, they have been clear communication and discussion on training plan with their coaches . Most of respondents told that there is no clear communication and discussion

between coaches and athletes ,this is also have impacted on their performance

Table 5.management and leadership qualities of a coach.

No	Respondents items	Category	Frequency	Percent
1	The coach management and leadership qualities that provide adequate skill and technique.	Excellent	4	44.45
		Very good	3	33.33
		Good	2	22.22
		Poor	-	-
		Very poor	-	-
		Total	9	100

Regarding to table 5, in no 1 according the coach management and leadership qualities that provide proper skill and technique ,4(44.45%) of respond that excellent management and leadership qualities that coaches they have been,3(33.33%) of the respondents told that very good management and leadership skills . At the end 2(22.22%) of the respondents replied that coaches have been good management and leadership qualities for providing proper skill and technique. As have been conclude that most coaches have offer excellent management and leadership qualities during and training

According to table 6, Coach's consider anthropometric variables during athlete's selection and club managers and coordinators give equal attention and material support like other running event.

No	Variance	Category	frequency	Percent
1	The coach considers physical fitness and anthropometric variables during athletes' selection?	Never	10	43.47
		Rarely	6	26.08
		Sometimes	7	30. 43
		Mostly	-	-
		Usually	-	-
		Total	23	100
2	The club managers and coordinators offer equal attention and material support like other running event?	Never	10	43.47
		Rarely	7	30.43
		Sometimes	4	17.39
		Mostly	2	8.69
		Usually	-	-
		Total	23	100

Regarding to table 6, in items 1 concerning to coaches consider physical fitness and anthropometric variables during athletes selection, 10(43.47%) of the respondents replied that we never to be consider, 6(26.08%) of the respondents told that rarely that has been consider physical fitness and anthropometric

variables. To the end 7(30.43%) of respond that sometimes we have been consider this basic variables. This result showed that, mostly coaches they are not consider physical fitness and anthropometric variability during athlete recruitment.

According to table 6, items 2 concerning to club managers and coordinators offer equal attention and material support like to others running event, 10(43.47%) of the respondents respond that never to support equally with other running event,7(30.43%) of the respondents replied that rarely that have been offering equal attention and material support and 4(17.39%) of the respondents told that, sometimes they have been providing equally. finally 2(8.69%) of replied that mostly they have gotten equal attention facility and material support. This implies that most of athletes respond that no equal attention and material support like to other running event.

Table 7, Sport facility and equipment for javelin and discus training shoes

No	Variance	Categorical	Frequency	Percent
1	The club have adequate sport facility and equipment for javelin and discus training shoes	Never	-	-
		Rarely	4	17.39
		Sometimes	8	34.78
		Mostly	6	26.08
		Usually	5	21.73
		Totally	23	100

From table 7, concerning to sport facility and equipment for javelin and discus throw training shoes, 4(17.39%) of the respondents respond that we have been rarely,8(34.78%) of the respondents respond that sometimes we have gotten the available facility and 6(26.08%) of the respondents that mostly they have got proper facility and equipment for training shoes . Finally 5(21.73%) of the respondents they told that we

have been available sport facility and equipment. It can be conclude that from the result showed that most of the respondents respond we have been rarely this implies there was in adequacy of facility and equipment.

Table 8, based on the awareness and concepts about discus and javelin throw.

No	Variance	Categorical	Frequency	Percent
1	The awareness and concepts about discus and javelin throw	Strongly disagree	-	-
		Disagree	7	30.43
		Undecided		
		Agree	9	39.14
		Strongly agree	7	30.43
		Total	23	100

From table 8, no 1, based on the awareness and concepts about discus and javelin throw, 7(30.43%) of the respondents told that disagree they haven't been base about the javelin and discus, 9(39.14%) of the coaches replied that agree and 7(30.43%) of they respond that strongly agree. These implies that most of the coaches they haven't been clear awareness and concepts in case of the event.

Table 9, Attitude and interest to go further in javelin and discus like other running event

No	Variance	Categorical	Frequency	Percent
1	The interest and attitude to go further in javelin and discus like other running events.	Strongly disagree	-	-
		Disagree	9	39.13
		Undecided	-	-
		Agree	10	43.47
		Strongly agree	4	17.39
		Total	23	100

From the above table 9, items 1 the interest and attitude to go maximum point in throwing event, 9(39.13%) of the coaches respond that disagree they couldn't expected at one days, 10(43.47%) of the respondent said that have been expectation to go further like any other running event and 4(17.39%) of told that strongly agree that have been an ambition to go maximum and compute with world players. As conclude most athletes have an interest to go far just like to running events.

Table10, items, 1 the coaches use properly plan training program based on athletes training age.

No	Variance	Categorical	Frequency	Percent
1	The coach use properly plan training program based on athletes training age.	Strongly disagree	-	-
		Disagree	9	39.13
		Undecided	-	-
		Agree	8	34.78
		Strongly agree	6	26.08
		Total	23	100

As have seen from the above table , concerning to the coaches use properly plan training program based on athletes training age,9(39.13%) of the coaches replied that disagree haven't been the training plan meet with the training age ,8(34.78) of the respondent told that agree that have been proper planning that concern the athletes training age. Finally 6(26.08%) of the coaches respond that strongly agree. These conclude that most coaches they have been used to properly plan training program based on athletes training age.

Table 11, the club have a criteria for talent identification and selection.

No	Variance	Categorical	Frequency	Percent
1	The clubs have a criteria for talent identification and selection	Strongly disagree	7	30.43
		Disagree	10	43.47
		Undecided	6	20.08
		Agree	-	-
		Strongly agree	-	-
		Total	23	100

According to the above table 11, the clubs have a criteria for talent identification and selection,7(30.43%) of replied that strongly disagree that haven't been criteria that mean simply have been used by guess,10(%) of the coaches told that disagree and 6(20.08%) of the respondents respond that undecided. from these result conclude that all most all coaches that haven't been a criteria for talent identification and selection, and also for this reason the throwing performance are un expected to maximize and near to the world athletes performance.

4.1.3. Discussion for talent identification

The most common and obvious way to identify athletic talent is to examine physical ability, but current research cautions against dimensional approach. As Simonton, 2001 notes that the idea that talent is a complex topic, stating that multiple components contribute to the development of talent in any domain. As Abbott et al, 2004 study denoted the importance of psychological skills in talent identification and development. They stated that **"**Athletes should not be excluded or identified based solely upon one

attribute, such as height. Abbott and Collins maintained that other factors like speed and agility may compensate for a weakness.”

The authors claimed their approach to athletic talent identification and development acknowledges the difference between performance and potential: (a) Main emphasis should be placed on potential to develop rather than immediate performance; (b) one‟s potential to develop rests on psycho-behavioral components; (c) in order to develop in a sport, essential fundamental movement skills must be present in their vocabulary (psychomotor); and (d) talent identification and talent development processes should be combined. Seemingly, it is difficult to include one aspect of the approach without addressing the others. "Is new approach may prove to be useful to those who are interested in talent identification and development.

4.1.4. Data analysis of coaches

Table12. Response regards on interest and commitments in coaching discus and javelin throw &sufficiency of facilities and alternative training field.

No	Response item	Scale	Frequency	Percent
1	The coach interest and commitment in coaching discus and javelin throw to go maximum	never	5	55.55
		rarely	2	22.2
		Sometime	1	11.11
		Mostly	-	
		usually	1	11.11
		total	9	100
2	The athletics clubs have standardized gymnasium and sufficient equipment (Facilities) during training session	never	4	44.44
		rarely	3	33.33
		Sometime	2	22.22
		Mostly	-	-
		usually	-	-
		Total	9	100
3	The sufficient training facility such as alternative training field, javelin, discus shoes, and proper wearing	never	-	
		rarely	6	66.66
		Sometim	3	33.33
		Mostly	-	
		usually	-	
		Total	9	100

As from table 12, above item 1, coaches respond on interest and commitment in coaching javelin and athletics ,5(55.55%) of the respondents that they would never to interested and commitment to be coaching the throwing athletics sport and, 2(22.22%) of the respondents responded that rarely interested to coaching athletics,1(11.11%) of the respondents told that sometimes they were interested and committed to be coaching throwing event and 1(11.11%) of respondents replayed that usually interested and committed to be coaching throwing. This implies that all most all coaches they are not interested and committed to coaching javelin and discus throw. This shows that it is difficult to improve the throwing performance because of interest and commitments are basic and prerequisite element of coaching athletics sport.

equipment, facilities and gymnasium, 4(44.44%) of the respondents responded that never that have been a sufficient equipment, facilities and gymnasium during the training session, 3(33.33%) of the

respondents responded that rarely that have been and 2(22.22%) of respond that sometimes they have been a sufficient equipment, facility and standardize gymnasium.

Finally above the table item 3, concerning to availability of alternative throwing training field, 6(66.66%) of the respondents respond that rarely they have been and 3(%) of the respondents replayed that sometimes they have been availability of alternative throwing field. As have been deduced that inadequacy of availability of alternative throwing training field, insufficient equipment facility and standardize gymnasium

Table 13 Respondent regards on training program

No	Response items	Scale	Frequency	Percentage
1	Does your athletes participate in planning the training planed program	Never	3	33.33
		Rarely	4	44.44
		Sometimes	2	22.22
		Mostly	-	-
		usually	-	-
		total	9	100
2	Does the training program consider athlete ability , chronological age and training age	Never	-	-
		Rarely	2	22.22
		Sometimes	7	77.78
		Mostly	-	-
		usually	-	-
		total	9	100
3	Does your club offer physical fitness and anthropometric measurement during athletes recruitment	Never	5	55.56
		Rarely	4	44.44
		Sometimes	-	-
		Mostly	-	-
		usually	-	-
		total	9	100
4	Do you think that having special skill and technique for throwing event	Never	-	-
		Rarely	4	44.44
		Sometimes	4	44.44
		Mostly	1	11.12
		usually	-	-
		total	9	100

5	Do you motivate your athletes during and after training program	Never	-	-
		Rarely	-	-
		Sometimes	-	-
		Mostly	9	100
		usually	-	-
		total	9	100
6	Do you have clear discussion and communication with your athletes	Never	-	-
		Rarely	-	-
		Sometimes	-	-
		Mostly	9	100
		usually	-	-
		total	9	100
7	Do you use different coaching method during training	Never	2	22.22
		Rarely	2	22.22
		Sometimes	5	55.56
		Mostly	-	-
		usually	-	-
		total	9	100

Scale: 5=Usualy4= Mostly 3=Sometimes 2=rarely 1=never

As seen from table 13, above items 1, coaches response athlete participate with planning the training planed program, 3(33.33%) of the respondents replied that we never follow-up the training plan program and 4(44.44%) of the respondents responded that rarely used to participate with training plan program. finally 2(22.23%) of the respondents told that sometimes we have been participated with training plan program. These conclude that most of athletes they were not to follow-up and participate with the training plan program.

As seen from table 13, above items 2, coaches response training program classified according to athlete's ability, age, and experience, 2(22.22%) of the respondents responded that rarely classified by ability, age and experience and 7(77.78%) of the respondents replied that sometimes . These conclude that coaches couldn't use the classification of athletes based on ability, age and experience.

As show from above table 13, items 3, does your club use physical fitness and anthropometric measurement during athletes recruitment, 5(55.56%) of the respondents believed that we never to measure, 4(44.44%) of coaches respond that rarely we have been measure the physical fitness and anthropometric variables. These imply that all most all coaches weren't to measure anthropometric and physical fitness variables during athletes' selection.

As show from above table 13, items 4, do you think that having special skill and technique for the event, 4(44.44%) of coaches' told that rarely we have skill and technique, 4(44.44%) of coaches replied that sometimes we have to be special skill and technique. Finally 1(%) of respondent respond that mostly have been special skill and technique. These deduce that most of beyond 85%of coaches they haven't enough skill and technique

As indicated from above table 13, items 5, coaches response motivate your athlete 9(100%) of the respondents replied that mostly motivated the athlete. This implies that coaches were mostly motivated athletes.

As indicated from above table 13, items 6 coaches response clear discussion and communication in various ways of life for your athletes, 9(100%) of the respondents responded that mostly communicate and discus with athletes. This concludes that coaches were mostly discus and communicate with their athletes.

As seen from table 13, above items7, coaches response use different coaching skill method during training, 2(22.22%) of the respondents confirmed that never they have been used different training method, 2(%) of the respondents respond that rarely have been used and 5(55.56%) of the respondents replied that sometimes have been used different training method. From this conclude that coaches weren't used different kind of training metrology, that means they were used always the same training method.

In line with the above finding, on coaching skill, Thompson, 2009 stated that when a coach first begins to work with athletes he tends to be initially focused on developing his competence in the doing of his coaching. With this competence comes confidence in working with athletes. Here the focus is on the competence of doing your coaching by identifying the **five basic skills of coaching** that all coaches should use as a foundation for their work with athletes. These five skills of coaching can also be represented on the fingers and thumb of a coaching hand.

- Building and developing relationships-the primary skill of coaching.
- Providing instruction and explanation –the „telling skill" of coaching.

- Providing demonstration- the „showing skill‟ of coaching.
- Observing and analyze- the „seeing skill‟ of coaching.
- Providing feedback-the „teaching skill‟ of coaching

Table14. Response concerns on leadership styles of coaching and practicing javelin and discus technique per week?

No	Response item	Scale	Frequency	Percent
1	What leadership style do you follow during training session?	Autocrat	1	11.11
		Lassies- fair	-	-
		Democratic	5	55.56
		all	3	33.33
		Total	9	100
2	How many days you practice javelin and discus technique per week?	3-4dayes	6	66.67
		2-3day	3	33.33
		1-2day	-	-
		Total	9	100

Scale: 1= Autocrat o =Lassies- fair 5=Democratic 3=All

Scale: 6=3-4days 3=2-3days =2 days o=days

In the table, above items1, respondents were told that what leadership style do you follow during training session, 1(11.11%) of respondents respond that autocratic style of coaching 5(55.56%) of respondents confirmed that they were used democratic styles of coaching and 3(33.33%) of coaches that used to all styles of coaching based on the situation. This implies that coach follows mostly democratic styles of coaching. As agreed that democratic styles of management or styles of coaching is crucial for the achievement of athletics performance, so that coaches should be used participatory styles (clear discussion and communication) styles of management in everyday life of the trainees. In the table items 2, how many days you practice throwing techniques per week, 6(66.67%) of respondents told that 3-4 days and3 (33.33%) of respondents they were used 2-3 days. This shows that mostly coaches they were used 3-4 days of practice.

Table 15 Response about on coaching training certificate and whom initiated to be throwing coach?

No	Response item		Frequency	Percent
1	Do you have coaching training certificate in javelin and discus throwing event?	Yeas	-	-
		No	9	100%
		Total	9	100%
2	Whom you initiated to be throwing Coach?	Your interest	1	11.11%
		Your coach	2	22.22%
		Your family	-	-
		Your friend	6	66.67%
		Total	9	100%

From table 15 concerning to items 1, coaching training certificate 9(100%) of club coaches respond that they haven't training certificate in the area of the event .Generally this shows that all most all sport organizational body, coaches and other related stakeholders did not give emphases or weight to the field, since there is no coaches have been a training certificate in the throwing field. According to the table whom you initiated to be throwing coach concerning to this 1(11.11%) of coaches respond that by their own interest, 2(22.22%) of coaches respond by other coach factor and 6(66.67%) of coaches told that by their teammates. This implies that most coaches were beyond 77.78% of inter to be coaching based on external factors by coaches and peers pressure means not by their interest this is the negative implication of throwing performance.

4.2. Inferential result of the study

It is the advanced type of statistical analysis, which shows the correlation of variables under the study. Basically regression and correlation have been used to examine the effect of major determinant variables

influence the improvement of throwing performance in selective amhara regional state athletics sport club.

Table 16, shows mean and standard deviation.

	N	Minimum	Maximum	Mean	Std. Deviation
The improvement of athletes performance	36	2.33	5.00	4.0278	.70542
Talent identification and athlete recruitment	36	2.33	5.00	4.0539	.71619
Technique , skill and knowledge factors	36	2.33	5.00	3.9722	.72320
Discussion and communication factors	36	2.33	5.00	3.9180	.71685
Sport facility and equipment factors	36	2.33	5.00	3.8585	.74555
Interest and commitment	36	2.33	5.00	4.0904	.66842
Training methods	36	2.33	5.00	3.8909	.72167
Management and leadership quality factors	36	2.33	5.00	3.9679	.65044
Valid N (listwise)	36				

4.2.1 Bivariate Correlation Analysis

Bivariate correlation analysis shows the effect of each predictor variable on the response variable. The correlation coefficients for each pair of study variables have been calculated. If the correlation value is greater than 0.5, there is a significant correlation between the variables and its significance can be shown by using the significance level or the so called p-value.

Table 16 below shows the bivariate association of the computed variables under the study. From the result of correlation it is evident that the improvement of throwing performance has strong association with Technique (skill) and knowledge factors, Interest and commitment, training method, Talent identification and athlete recruitment, discussion and communication factors, Management and leadership quality factors and sport facilities and equipment factors. Technique (skill) and knowledge factors are the dominant determinant of the improvement of throwing performance with Pearson correlation coefficient 0.910. The second most critical determinant of throwing performance with Pearson correlation coefficient 0.905 is

interest and commitment factors. The third dominant determinant of throwing performance with Pearson correlation coefficient of 0.*835 is* training method factor. The fourth significant of the improvement of performance with Pearson correlation coefficient 0.811 is talent identification and athlete recruitment. The fifth critical dominance factor of throwing performance is discussion and communication with personal correlation coefficient of 0.782.

Subsequently, leadership quality and availability of sport facility and equipment factors have a significant correlation with that of the improvement of throwing performance with Pearson correlation coefficient 0.757 and 0.735 respectively.

Table 17 .Bivariate association of throwers performance and the set of determinant variables'

Computed study variable		*The improvement of athletes performance*	*Talent identification and athlete recruitment*	*Technique , skill and knowledge factors*	*Discussion and communication factors*	*Sport facility and equipment factors*	*Interest and commitment*	*Training methods*
The improvement of athletes performance	*Pearson Correlation*	*1*	*.811***	*.910***	*.782***	*.735***	*.905***	*.835***
	Sig. (2-tailed)		*.000*	*.000*	*.000*	*.000*	*.000*	*.000*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*
Talent identification and athlete recruitment	*Pearson Correlation*	*.811***	*1*	*.503***	*.655***	*.537***	*.810***	*.606***
	Sig. (2-tailed)	*.000*		*.002*	*.000*	*.001*	*.000*	*.000*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*
Technique , skill and knowledge factors	*Pearson Correlation*	*.910***	*.503***	*1*	*.386**	*.479***	*.579***	*.511***
	Sig. (2-tailed)	*.000*	*.002*		*.020*	*.003*	*.000*	*.001*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*
Discussion and communication factors	*Pearson Correlation*	*.782***	*.655***	*.386**	*1*	*.575***	*.790***	*.659***
	Sig. (2-tailed)	*.000*	*.000*	*.020*		*.000*	*.000*	*.000*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*
Sport facility and equipment factors	*Pearson Correlation*	*.735***	*.537***	*.479***	*.575***	*1*	*.674***	*.659***
	Sig. (2-tailed)	*.000*	*.001*	*.003*	*.000*		*.000*	*.000*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*

Interest and commitment	*Pearson Correlation*	*.905***	*.810***	*.579***	*.790***	*.674***	*1*	*.706***
	Sig. (2-tailed)	*.000*	*.000*	*.000*	*.000*	*.000*		*.000*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*
Training methods	*Pearson Correlation*	*.835***	*.606***	*.511***	*.659***	*.659***	*.706***	*1*
	Sig. (2-tailed)	*.000*	*.000*	*.001*	*.000*	*.000*	*.000*	
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*
Management and leadership quality factors	*Pearson Correlation*	*.757***	*.580***	*.384**	*.667***	*.567***	*.707***	*.633***
	Sig. (2-tailed)	*.000*	*.000*	*.021*	*.000*	*.000*	*.000*	*.000*
	N	*36*	*36*	*36*	*36*	*36*	*36*	*36*

***. Correlation is significant at the 0.01 level (2-tailed).*

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

4.2.2. Correlation analysis

In the present investigation simple correlation coefficients were computed among seven studying variables and are presented in table 18, the attributes revealed that technique (skill) and knowledge factors showed highly significant ($p<0.01$) positive ($r= 0.910$) associations with the improvement of throwing performance. This implies that the effectiveness of throwing performance can be increase by when the technical, skill and knowledge gape solving or reducing. On the other hand interest and commitment factors showed highly significant positive association with the improvement of throwing performance. Moreover improving the technique, skill and knowledge factors play the major role for the improvement of throwing performance, popularity and competitiveness for the sport world. The effectiveness of throwing performance, technique, skill and knowledge, showed highly significant positive association with interest and training method factors by.*579**and .511*** consecutively.*

interest and commitment showed highly significant positive association with talent identification and discussion and communication factors or creating a good and suited training ground may facilitate the effectiveness of throwing performance and solve interest and commitment factors and problems may lead

to create good training ground /center/ and well suited sport facilities and equipment to produce good and competitive sport manpower, so that there should be a persistent and consistent sport development in all aspects which leads for economic growth of one's country. Management and leadership qualities factors showed that significant ($p<0.05$) positive association with technique, skill and knowledge factors, so that by solving or reducing management and leadership factors and can create and supply good skill and knowledge which adds good value and role for the improvement of throwing performance.

4.2.3. Basic outputs of multiple linear regression model

Adjusted R Square in the model summary table below shows the degree of explanation of the dependent variable by the model. The result reveals that about 93.3% of the variability in the improvement of throwing performance is explained by the set of different predictor variables in the model.

Table 18 Model summary table

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	.972	.946	.932	.18393

As indicated the table 18, analysis of variance (F-test) part of regression analysis shows that the overall model is significant or not. The significance level in the following table reveals that the regression model is highly significance to fit the data. And the cumulative effect of the set of predictor variables on the improvement of throwing performance is highly significance, but it doesn't show which predictor variable make the model significance, which can be examined by the coefficient table (t-test) below

Table19. ANOVA Table (F-test)

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.469	7	2.353	69.543	.000[a]
Residual	.947	28	.034		
Total	17.417	35			

The coefficient table or t-test of regression analysis shows the effect of each predictor variable on the response variable. Referring significance level of each predictor variables shows that technique (skill) and knowledge, Interest and commitment factor, training method and talent identification and athlete recruitment have highly significant effect on the improvement throwing performance.

Table20. Coefficient table (t-test)

Variance	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	-.698	.226		-3.087	.005
Talent identification and athlete recruitment	.262	.113	.248	2.310	.028
Technique , skill and knowledge factors	.248	.069	.254	3.600	.001
Discussion and communication factors	.086	.076	.087	1.136	.266
Sport facility and equipment	.150	.072	.138	2.084	.046
Interest and commitment	.185	.055	.189	3.354	.002
Training methods	.174	.075	.177	2.333	.027
Management and leadership quality factors	.082	.061	.087	1.345	.189

a, dependent variable =improvement of throwing performance

The fitted multiple linear regression equation is given by:

$\mathbf{Y_i =}\ _{.698} + .\mathbf{248}X_1 + ..\mathbf{254}X_2 + ..\mathbf{087}X_3 + ..\mathbf{138}X_4 + .\mathbf{189}X5 + ..\mathbf{177}X6 + ..\mathbf{087}X7$, where Yi is the improvement of athletics throwing performance and X_1 is talent identification and athlete recruitments X2 is technique(skill) and knowledge, X3 is discussion and communication factors ,X4 is sport facilities and equipment factors ,X5 is interest and commitment factors ,X6 is training method factors and X7 is management and leadership quality factor. The set of predictor variables listed in the coefficient table, and the regression coefficients β_i for each predictor variable also given in the above table.

From the table above it has shown that technique (skill) and knowledge factor is highly significant with β = 0.189 and p = 0.001. This shows that, the throwing performance are mainly affected by technique (skill) and knowledge. As conclude that, the throwing performance couldn't to achieve without adequate technique, skill and knowledge.

Interest and commitment factors also has significant effect on the effectiveness of throwing performance with β = 0.176 and p = 0.003. From this the researcher concludes that the majority of respondents were responded that all most all athletics club coaches, athletes and club owners they didn't have interest and commitment about throwing field. As have been conclude that without interest and commitment of related sport bodies, there is no expected the improvement of throwing performance.

Training method is the other important variables having significant effect on the improvement of throwing performance with β = 0.77 and p = 0.027. This show that the training method give perfectly for athletes not evaluates the athlete performance and also coaches and athletes not relationship with them and not used training program, periodically

4.3. Findings from observation

In order to obtain information about availability of adequate facilities and equipment and the access of clean water, bead room, net and silent and alternative training environment or field, clinic, shower, cafeteria, physiotherapy, massage and coaches and athletes sport wear observation has been used by the researcher.

Hence, the researcher has been observed concerning on discus and javelin throwing training field, it can be all most all athletics sport clubs they haven't adequate and alternative silent training environment, even one club such as trite corporate the site or place of the athletes dormitory which are near to the center of the city it is inside of different fabric, in some extent Debrebrhan training center it has alternative and silent training environment and have good site of the athletes comp.

As stated above concerned to availability of training facility and equipment such as coach and athletes sport wear, investigators has been observed some clubs they have available sport wear as such it was not satisfactory. Concerning to training facility such as discus and javelin equipment, they didn't have plenty of throwing facility in the clubs the reason why the club stakeholders they didn't have attention like others facility. Regarding to adequacy of basic needs like changing room, shower, clean water, clean

toilet, availability of transportation, Cafeteria, well-educated and skilled human power concerning to physiotherapy and massage & clinics were partially not available.

The other problem which the investigator has observed, there is no athletes recorded document /profiles/ in organized form. In line with the above finding, according Thompson, 2009, states that the first stage of preparing a training plan is to gather background information about your athletes and the objectives for the forth coming season.

To summarize the above problems have seen during the observation; the club they haven't adequate facility especially concerned on clean silent bad room, clean water, alternative throwing field, transportation , cafeteria , medical service well educated and skilled human power concerning to physiotherapist and massages.

4.4 Findings from interview

As the data obtained from interviewed, on major problems that face concerning to support the clubs improvement shows that; shortage of equipment and facilities, shortages of medical service accessibility, lack of different physiotherapists and massages, lack of shower, lack of transportation system for training purpose & refreshment.

In concerning to training plan all coaches told that they never to conceder and provided special attention for individual based training system those are athletes training age and performance and they revealed that lack of technically skilled full coaches, lack of specialized coaching certificate in the event, lack of interest and commitment in athletes and coaches. It has poor athletes profile arrangement and they have lack of anthropometric measurement during athlete selection and lack of scientific ways of talent identification methods and poor communication and discussion concerning to training plan between coaches and athletes.

As the data obtained from interviewed, other problems club coordinators, coaches and managers

As the information stated from interviewed and open ended questionnaire, some possible solution were raised from club coordinators, managers and coaches. These were:- concerning the thought of coordinators, managers and coaches they have to be work together with other stakeholders such as club owners and coordinated with Amhara region athletics federation should work together

smoothly and jointly with clubs & search a solution by giving high emphasis and designing new strategies for athletics club, sufficient resources (facilities and equipment, alternative training areas, and skillful and qualified man power such as physiotherapists and massage), and allocating sufficient and standardize gymnasium and all throwing facilities for the clubs by building strong relationship with federal, regional athletics federations and club owners.

Coaches should use varied instructional coaching skill method in order to motivate the athlete's interest in the area of throwing and should have to improve their knowledge and skill for improving thrower performance. Furthermore coaches should have to measure anthropometric variables used as one of athlete's selection criteria and told that they have to use athletes profile in a well organized form.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter summarizes the major findings of the study and drawn conclusion based on the findings. At the end, recommendations are forwarded that are thought to be helpful to address the major determinant variables that influence throwing performance.

5.1 Summary

The purpose of this study was the major determinant variables influence javelin and discus thrower performance in four amhara regional state athletics sport club. In order to answer the questions, the researcher has been used descriptive survey design was employed. The relevant data to the study were gathered through two sets of questionnaires, interview and Observation. In generally, 36 participants were involved in the study. These are 23 athletes, 9 coaches, 2 club coordinators and 2 club managers were participated in the questionnaire and 4 coaches and 1 manager and 1 club coordinators have involved in the personal interview, and also 23 athletes participated in the experimental research study.

The data obtained were analyzed using inferential statistics both quantitative and qualitative methods such as frequency, percentage and correlation and regression. Finally, based on the analyzed data, the following major findings were obtained from the study:-

The correlation and regression analysis of the study show that technique (skill) and knowledge factor is highly significant with $\beta = 0.189$ and $p = 0.001$, interest and commitment factors also has significant effect on the effectiveness of throwing performance with $\beta = 0.176$ and $p = 0.003$ and training method is the other important variables having significant effect on the improvement of throwing performance with $\beta = 0.77$ and $p = 0.027$.

The study also identified that ,there haven't adequate sport facility and standardize gymnasium, equipment ,alternative training field ,clear water, shower and bad room and well educated physiotherapist and massage. The study revealed that training is not an individual based classified according to athletes ability, age and experience and there is no well organized and recorded athlete's profile. The study revealed that there is no clear discussion and communication between coach and athletes in the training plan. The study showed that all club coaches they don't have specialized training certificate in the throwing event.

The majorities of coach's respondent replied that they offer little emphasis for talent identification and for performance evaluation during athlete recruitment. The interest, commitment and motivation of the athlete, coaches and managers are week. The club stakeholders, coordinators and managers and regional sport federations they have little emphasis for the throwing event.

5.2 Conclusion

Based on the results of the study the researcher obtained and analyzed, the following basic points were forwarded as a conclusion.

- The improvement of throwing performance has strong association with Technique (skill) and knowledge factors, Interest and commitment, training method, Talent identification and athlete recruitment, discussion and communication factors, Management and leadership quality factors and sport facilities and equipment factors

- Concerning to training facility such as discus and javelin equipment, they didn't have plenty of throwing facility in the clubs the reason why the club stakeholders they have little attention towards the event.

- In concerning to training plan all coaches told that they never to be conceder and provided special attention for individual based training system such are athletes training age, ability, experience and performance.

- As have been conclude that most coaches have offer excellent management and leadership qualities during and after training program.

- During the observation; the club they haven't adequate facility especially concerned on clean silent bad room, clean water, alternative throwing field, transportation , cafeteria , medical service well educated and skilled human power concerning to physiotherapist and massages.

- Coaches, managers and technical staffs they have little emphasis for scientific ways of talent identification and recruitment procedure.

- Poor communication and discussion concerning to training plan between coaches and athletes.

- As have seen from the finding most coaches have offer excellent management and leadership qualities during and training.

- In the study showed that lack of knowledge, skill and technique gape has been observed both coaches and athletes.
- Athletes join in the club without properly to measure performance, talent identification and evaluation test.

5.3 Recommendation

Based on the findings and conclusions drawn, the following recommendations were forwarded.

- In the study showed that lack of knowledge, skill and technique gape has been observed. These were one of a critical determinant variable for the improvement of throwing performance. Therefore the concerning bodies should provide special attention and concentration for this variable.

- In the study showed that interest and commitment has been the second determinant factor for improving throwing performance. However, coaches, athletes and club owners they were not interested and motivated enough to support throwing athletes by any incentives and adequate sport facilities like to other running event.

  Therefore, the respective body should design additional motivation mechanism such as creating conducive competition program, offering suitable and comfortable training facility and providing monetary reward.

- The scientific ways of talent identification and recruitment procedure is one of a key and the fourth dominate variables for the improvement of throwing performance. So coaches should be offer special concentration and attention for the athletes' selection and talent identification, because of these are one of a solid hindering variable for throwing performance. Therefore club coaches, managers and technical staffs should follow scientific ways of talent identification and recruitment procedure and also conceder anthropometric variables and physical fitness qualities.

- In the study communication and discussion is the fifth dominate factor for improving throwing

performance therefore, coaches should be improve discussion and communication skill with athletes concerning to their objectives and goals.

- From the finding of this study has been observed that shortage of adequate sport facilities, materials and training equipment were found so that the club owners, regional sport government and the federal athletics sport government should work together compressively and conjointly for alleviating these prohibiting problems and create conducive training environment for athletics club performance progress again.

- The regional athletics federation and club owners communicate with them concerning on coaches knowledge and skill they should be design and to offer coaching certificate cores for athletics coach in order to improving the coach educational qualification and to alleviate skill and knowledge problem.

- The clubs coordinator, managers and concerning sport bodies should work smoothly and cooperatively in order to bring about basic and significant change for the javelin and discus throw.

- As the finding of this study revealed that the majority of coaches have little awareness and knowledge on the javelin and discus throw, so the club owners and regional and federal athletics sport office should offer refreshment coaching course, workshop and seminars so as to alleviate such problems

Training method is the third dominant variable for the improvement of throwing performance therefore:-

- When to provide training program coaches should be use variety of coaching method for avoid boring and conceder the athlete level of interest, motivation, training age, level of performance and experience.
- Develop and design the Experiences exchanging programs for athletic club coaches with other athletics club within region and between neighboring regions to improve knowledge and skill of training as well as to reduce the gap knowledge between the coaches.
- Coaches should be improve his or her level of skill and knowledge as well as coaching certificate through taking of different short refreshment courses communicating with regional and federal governmental and nongovernmental athletics sport organization.

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Appendix-1

DEBIREBIRHAN UNIVERSITY

College of Natural and computational science department of sport science

Questionnaire to be filled by Athletes

Dear respondents:

The purpose of this questionnaire is designed to collect data for the study to assess major determinant variables influence discus and javelin athletes performance selected of Amhara national regional state athletics sport club. The data to be collected using this questionnaire is uses only for academic purposes and all information gather from you will be helpful to get pertinent fruit full findings and to forward timely recommendation. Your responses are confidential and are not use for other purpose rather than this study. Therefore in order to obtain relevant and reliable information that will contribute to the success of this study. I kindly request your cooperation to answer all the questions frankly as you feel.

Thank you in advance for your help

Section I: General Background Information of Respondent

Indicate your response either by circle letter or writing short answers on the space provided.

1.1 Name of the clubs _____

1.2 **The respondent'sSex** (a) Male□ (b) Female□

1.3 **Age category**

(a)Below 17years □(b) 18-23years□(c) 24-28years□(d)30years &Above□

1.4 Educational Background of Respondents

(a)Below grade 4☐(b)Primary5-8 grade☐ (c) High school9-12 grade☐

(d)Collage/university☐

1.5 Training age of Respondents

(a) Below 1year□ (b)2-4years□ (c) 5-7years□

1.6 Height_____ Weight _____ limb size_____ shoulder width_____

Section II: **Put your agreement on the space provided putting(√) mark on your Choice.**

Rating Scale: 5=strongly agree 4=agree3=Undecided 2=disagree,

1= strongly disagree

	Items	Responds				
No		5	4	3	2	1
1	The coaches giving training concerned on athlete's ability, performance and training age.					
2	The effort and devotion of coaches to properly manage and provide adequate skill and technique.					
3	The coach use properly plan training program based on athletes training age.					

4	The coach providing motivation and proper feedback during and after training and competition.					
5	The coaches have clear discussion and communication concerned to training plan and goals.	Never	Rarely	sometimes	mostly	usually
6	The coaches consider physical fitness and anthropometric variables during athletes' selection	Never	Rarely	Sometimes	Mostly	Usuall
7	The clubs have available sport wear and throwing shoes	Never	Rarely	Sometimes	Mostly	Usuall y
8	The clubs have appropriate sport facility and equipment?					
9	The conceptual skill and techniques of your coach					
10	The awareness and concepts about discus and javelin					
11	The interest and attitude for javelin and discus to go further					
12	The clubs have a criteria for talent identification and selection					
13	The clubs managers and coordinators offer equal attention and material support like other running event	Never	Rarely	Sometimes	Mostly	Usuall y
14	The club has practical training equipment such javelin and discus					
15	The appropriateness of training field for training					
16	The management and leadership qualities of coach	Excellent	V.good	Good	Poor	V.poor

Section III: Read the question clearly and write short answer on the space provided

1. As if being throwing athletes what do you think the prohibiting factors that hinder javelin and discus to perform in a good way?

A. ----------

B.----------

C. ----------

D. ----------

2. Generally, in your opinion what measures or strategies should be taken to achieve the objective of discus and javelin thrower performance for the future and compete with other country players?

A_____

B._____

C._____

D._____

Appendix-2

DEBIREBIRHAN UNIVERSITY

College of Natural and computational science department of sport science

Dear coaches:

The purpose of this questionnaire is designed to collect data for the study to assess major determinant variables influence discus and javelin athletes performance selected of Amhara national regional state athletics sport club. The data to be collected using this questionnaire is uses only for a academic purposes and all information gather from you will be helpful to get pertinent fruit full findings and to forward timely recommendation. Your responses are confidential and are not use for other purpose rather than this study. Therefore in order to obtain relevant and reliable information that will contribute to the success of this study. I kindly request your cooperation to answer all the questions frankly as you feel.

Thank you in advance for your help

Section I: General Background Information of Respondent

Indicate your response either by marking circle or by writing short answers on the space provided.

Section I:-please write your background information on the space provided.

1.1 Name of the clubs _____

1.2 Sex (a) Male ☐ (b) Female ☐

1.3 Chronological age

(a) 21-30 years ☐ (b)31-40years ☐ (c) 41years & above ☐

1.4 Educational status

A, Grade 10-12 B, Diploma in sport science C, Degree in sport D. Degree others E, masters in

sport relate

1.5 Leadership and Experience of Respondent

(a) Below 1year☐ (b)1-5years☐(c) 6-10years (d) 11years and above☐

Section II: **for the following questions respond by circling your choice**.

1. Do you have coaching training certificate?

A. Yes B . no

2. If your answer for question 1 is yes what level of certificate do you have?

A. First level (national) B. Second level (national) C. First level IAAF
D. Second level IAAF E. Third level IAAF

3. How many years of experience do you have as a coach?

A. Below 1 year B.1-4 yearsC.5-10yearsD above10years

4. If you have coaching training certificate, in which event do you have?

A. in short distance B .in middle distance C. in long distance
D. in throwing events E. in jumping events

5. What coaching style or leadership style do you use?

A. Democratic B. Authoritarian C. Causal/lassie fair D. use all based on

6. Whom you initiated to be throwing coach?

A, your interest B. your coach C. your family D. your friends

7. Do you have clear concept and awareness about javelin and discus throw?

A. Yes B. No

8. How many days you practice javelin and discus technique per week? ----------

9. Do you have long term goals and objectives in throwing event?

A. Yes B. No

Section II: **Put your agreement on the space provided putting (√) mark on your Choice.**

Rating Scale: 5=strongly agree 4=agree3=Undecided 2=disagree,

1= strongly disagree

	Items	Respondents				
No		5	4	3	2	1
1	The athletes participate in planning the training planed program					
2	The sufficient training facility such as alternative training field ,javelin, discus shoes and proper wear					
3	The coach having special skill and technique for javelin and discus throw					
4	The clubs have standardized gymnasium and available equipment for throwing event					
5	The interest and commitment to go maximum point concerning to throwing field					
6	The training program consider athlete ability ,chronological age and training age					
7	As a coach use different coaching skill method during training					
8	The club emphasis physical fitness and anthropometric measurement during athlete selection					
9	The coach have clear discussion and communication with your athletes regarding to training plan and meet with athletes' goals and objectives					

Section III: write your idea or opinion the provide space

1. As if being throwing coach what do you think the prohibiting factors that hinder javelin and discus to perform in a good way?

A._____

B._____

Appendix-3

Debrebrhan University

College Of Natural and Computational Science

Department Of Sport Science

Interview for Coaches, managers and club coordinator

1. Would you tell me about the availability training facility and equipment such as gym and training sport wear and shoes about your club and alternative training area of the clubs?

2. How do you explain the relationship between the athletes with club coaches and managers concerning training plan?

3. How do you explain discus and javelin thrower performance in amhara regional context?

4. How do you think about your training plan meet with their athlete's specific goals and objectives?

5. How do you explain athletes profile arrangement?

6. Do you have specialize coach in the area of throwing event

7. How do you imagine your skill and knowledge gape about throwing event to improve its performance?

8. How do you say coaches and athletes interest throwing event?

9. How do you explain the determinant variables influence discus and javelin thrower performance in amhara regional clubs?

10. How do you explain the anthropometric variables before athletes' recruitment and how much you provide weight its value for the throwing athletes' performance?

1)._____

2)._____

3)._____

12. As club managers and coordinators what possible solution would you suggest or recommend to alleviating the problem?

1). ----------

2). ----------

3). ----------

4). ----------

5). ----------

Appendix 4

Debrebrhan University

College of natural and computational science

Department of sport

Observation checklist

General information

1. Name of club----------

2. Topic of the study----------

3. Date of observation----------

4. Place of observation----------

5. Number of the athletes Male----------Female----------

6. Length of the observation period---------- Starting----------Ending----------

7. No of training days per week----------

Availability of facility and equipment

Note: AV= Available PV=partially Available NA= Not Available

No	Equipment and facilities	AV	PV	NA	Remark
1	Alternative Training field				
2	Standard javelin and discus				
3	Deferent medicine ball				
4	Standardize gymnasium				
5	soft balls/ground tens /				
6	Whistle				
7	Stop watch				
8	Meter				
9	Athletes training and competition shoes				
10	Physiotherapist and massage				
11	Clean water and shower				
12	Availability of transportation				
13	Coach sport wear and shoes				
14	Clean net bad room				
15	Clean cafeteria and hospital				

Sign of observer----------

Date----------