CHAPTER 1

Introduction
Chapter-I

Introduction

Athletics also known as track and field, is a collection of sport events that involve running, throwing, and jumping. The name is derived from the Greek word “Althon” meaning “Contest”. Track and field or athletics is considered as the mother discipline of all sport and games. The Olympic Games are held after every four years and later the Greek method of counting the year even referred to these games. Using the term Olympic for the period between two games. The historian Ephorus, who lived in the 4th century BC is believed to have invented the use of Olympiads to count years much as we today use AD and BC. Previously every Greek state used its own dating system, something that continued for local event, which led to confusion when trying to determine dates. Diodorus states that there was solar eclipse in third year of the 117th Olympiad and that must be the eclipse of 310BC. This gives us a date of (mid-summer) 776 BC for the first year of the first Olympiad” Nevertheless. Romans were fond of Athletics. They aimed at military proficiency through games and sports.

The uncovering of the ancient athletics site at Olympia and the knowledge gathered from various books relating to the inspiring history of the ancient games influenced the intellectual circle of the
world in the 19th century. At this time, it was felt that bringing together of youth, in the spirit of ancient Olympic competitions, would not only contribute to the development of healthy youth, but also lay a foundation of peace in the world.

The credit of reviving the ancient Olympic Games goes to a French Baron, Pierre de Coubertin, who was born in Paris on 1st January 1863. As a young man, Coubertin had refused careers in literature and history. He had chosen to work in the field of sociology and education. He believed that intelligence cannot exist without training of the body. For this reason, he was a great admirer and propagator of school sports. Due to this effort, the first inter-school athletics games held in Paris in 1889. This was his first step in the direction of revival of Olympics on an international level. According to Prof. Carl Diem of Germany, love for peace and respect for life drove Coubertin to the idea of reviving the Olympic Games. Coubertin, due to his untiring efforts, succeeded in organizing a “Congress” on 23rd of June 1894 that decided to revive the ancient Olympic Games from the soil of their birth i.e., Greece in 1896. Thus, Coubertin had won at last. It was in 1896 in the stadium at Athens (Greece) that the first Olympic Games of the modern era held.

The first Olympic Games of modern times held in Athens in 1896 on the decision of the first Olympic congress that met in Paris in 1894.
and followed the initiatives and aims of Baron Pierre de Coubertin. To mention but a few figures, in 1896 13 countries and 285 athletics competed in 10 disciplines in Athens for the first Olympic medals. As early as in 1896 track and field event were predominant in the Olympic Games.

At present, track-and-field consist of running, hurdling, jumping and throwing events held between individuals and teams at indoor and outdoor meets. The running and hurdling competitions make up the track events, while the jumping and throwing contests comprise the field events. In many countries the sports as a whole called athletics. Running races are the most prominent track events; the range in length from the indoor 50 meter dash to the outdoor marathon.

It is to note that the rules of 21st century competitions are quite different from those of ancient times. However, the spirit of the sport remains true to its early Greek roots. The modern Olympic motto Citius, Altius, Fortius (i.e.; faster, higher, stronger) best captures track-and-field competition. Each event determines who can run the fastest, who can jump the highest or the longest, or who can throw the farthest.

HISTORICAL ROOTS OF ATHLETICS IN INDIA:

The roots of athletics in India in its present form can be traced back to the last decade of the nineteenth century. Nothing much is known of its early stages, till first known participation of Norman G.
Pitchard in 2\textsuperscript{nd} Olympic Games in 1900 at Paris, where he won a Silver Medal in 200m. History does not speak much of this sport between 1900 and 1920. However, athletics competition was held as Inter Provincial Athletics Championship every two years.

India in the meantime participated (unofficially) in 1920 Olympic Games at Antwerp (Belgium) with 4 Athletes and 1924 Olympic Games at Paris with 8 Athletes under the leadership of H.C. Buck of YMCA Madras. The official participation of Indian athletes started in the 1928 Olympic Games at Amsterdam with a seven member team. Since then India participated under the IOA Banner in 1932 Olympic Games at Los Angeles and 1936 Olympic Games at Berlin with 3 and 5 athletes respectively. Mr. M.C. Dhawan, who participated in 1932 Olympic Games at Los Angeles, became the Secretary of Amateur Athletics Federation of India in 1950.

However, the Amateur Athletics Federation of India was formed in 1946 at the initiative of Maharaja Yadvindra Singh, the then President of Indian Olympic Association, with Prof. G.D. Sondhi as its first President. It got affiliated to IAAF (International Amateur Athletics Federation) in the year 1946. But it followed the IOA for holding the National Athletics Championship once in two years. It was only in 1949 that AAFI took the decision of holding the National
Athletics Championship every year. The AAFI for the first time selected 8 athletes (6 men and 2 women), who participated in 1948 Olympic Games at London. It was for the first time Indian women competed in the Olympic Games. From that time onward India is participating continuously in the Olympics and other games i.e. Asian games, Common wealth games, SAF games etc.

The poor performance of Indian track-and-field athletes at the International level has been a cause of great concern, especially to the coaches, physical educationists and sport scientists. Efforts have been made to improve the performance of our sportsmen for long, but little success has been achieved so far.

It is important to note that in contemporary India the choice of sports is determined by the child’s interest, facilities available and popularity of the sports in that particular society, ignoring whether his body structure is fulfilling the mechanical requirements of the game or not. If he chooses a wrong activity for which his body structure is not suited a limit is set beyond which, his performance cannot be improved, and however, hard he and his coach may try.

However as man develops from birth to maturity some of the most observable changes in his body are those of his physical
characteristics - his height, weight, shape and proportions. The patterns of growth of these characteristics result from the interaction of both inborn (genetic) and environmental factors, which are responsible for the performance of a sportsman. The physique and body composition including size, shape and form are known to play a significant role on the performance of an athlete. The performance of a sportsman in any game is also dependent on his suppleness, skill, training and motivation and on various other factor of physiological and biochemical nature. Age, sex and physical growth have also been noticed to influence a person’s capacity for physical activity.

**Cureton (1941)** stated that in general, people with long legs and long arms and relatively short and small trunks were physically weak in long sustained heavy work, but they might show great speed and endurance at high levels of athletics activity. Long third-class levers are noted for speed and range of action as well as for their efficiency for force.

**H. G. Dyson’s (1986)** stated that the running speed is the product of length and frequency of stride, their ratio changing from one phase of a race to another and from athlete to athlete yet these two factors are always interdependent and maximum running efficiency exists only when they are in correct proportion, depending mainly on the weight, build, strength, flexibility and co-ordination of the runner.
In contradiction to Prof. A.V.Hill’s original hypothesis, that the fastest time for a given middle or long distance could be attained by running at a constant speed, some physiologists have since suggested that the second half of such races should be run faster than the first, with the athlete conserving his anaerobic i.e. oxygen debt reserves until comparatively late in the race.

Tanner (1964) is of the opinion that a person using many smaller strides uses more energy over a given distance then a person using fewer and longer strides (provided the long stride spring naturally from his physique and are not artificially imposed)

Thus physical characteristics play a very vital role in all games and sports whether it is team or individual game, ideal body segments as per the demand of the particular event is necessary for higher achievement in that particular sport. In view of physical and psychological variations playing a significant role with performance of an athlete let us discuss certain important aspects associated with it.

The famous Black American 400 meters Olympic champion Lee Evans (1968) once said “you must have an intense love affair with the track” to become a champion athlete. It is due to such “love affair” with the track that you become a coach and that too not by compulsion or accident but by choice.
Sports, during the present century, has become a cultural phenomenon of great magnitude and complexity, rather, it is the major social institution, permeating education, economics, politics, art, religion etc and scope is awesome. Nearly everyone has become involved, in one way or the other, even if only vicariously.

Sports are as old as human society itself. It is an institution which has its own traditions and values. Being an institutionalized and competitive activity, it involves vigorous physical exertion or the use of relatively complex physical skill by individuals whose participation is motivated by a competition of intrinsic satisfaction with the activity itself and external reward earned through participation.

Sport as an activity offers an opportunity of self-knowledge, self-expression, and fulfilment; personal achievement, skill acquisition and demonstration of ability: social interaction, enjoyment, good health and well-being. It promotes involvement, integration and responsibility in society, especially when sport activities have been accepted as an integral part of the culture of every society in every nation.

In modern society, sport have very important role to play. Much of the attraction of the sport comes from a wide variety of experience and feeling that result from participation, such as, joy, anguish, success, failure, pain, relief, and feeling of belonging.
Sports competitions offer us heroes and heroines, for many youths. The sports stars are better known than the leading politician of a country, sports have ever reflected development in society.

George has rightly said: Sports and Games provided a medium for the development of the self “in fact societies provide a socio-cultural context with in which games and sports are included among the facilities for the human resource- development of society. Society may be rich in natural resources, science and technology but if it lags in developing health and spirit, it would fail as a social system. Sports contribute in the development of human resources in three ways i.e. physical fitness, mental fitness through alertness and promote character for motion by inculcating team spirit, loyalty and altruism.

A French mathematician, Quetelet coined the term anthropometric (anthropo means man and metry means measurement). In ancient India as well as in Egypt, the earliest Anthropometric studies were undertaken to find one part of the body which would predict or be come a common measurement of all other body parts.

Hippocrates was the first Greek expert in test and measurement who introduced the method of anthropometry in which the human beings were divided into two body types. Phthises dominated by the vertical dimension and Apoplectic dominated by horizontal dimension.
Hippocrate studied human physical types for medical purposes while Greek sculptors were doing so for their interest in physical perfection.

A review of literature reveals that anthropometry was the first technique of measurement used in physical education. Anthropometry was first introduced in physical education by a physician, Dr Edward Hitchcock who occupied the first chair of physical education created in U.S.A, in 1861 at Amherst College. Thus the history of measurement in physical education is less than 151 years old. Dr. Edward Hitchcock measured height, weight, girth, breadths, vital capacity and some strength variables of physical education students to evaluate progress and gain in health. D. A. Sargent who started a measurement programme at Harvard University (USA) in 1878 and published a manual on measurement and testing. In a famous meeting of pioneer physical educators held in 1885 at New York measurement was one of the major topics for discussion when association for the advancement of physical education was founded. This association and young men Christian association (YMCA) adopted the sergeants system of measurement for use in schools and colleges.

Measurement plays an important role to reach the peak level of performance in males’ long distance runners. The measure anthropometrical traits are as tall heights lighter in and lower the center of gravity provides the maximum level of perfection in the running events. As the world competition come in the mind of the sports man especially
of the long distance runners are affected by the various types of psychological problem as the anxiety, lack of confidence, and the efficacy.

Performance in sports competition at various levels have become a sign of prosperity. Development and innovation of new techniques in the field of sport is gaining momentum day by day and high level research in the field is going on to explore the possibilities of investigating the ingredients responsible for the enhancement of sports performance and facilitating the talent selection for competitions. New incentives sufficient infrastructure and standardized sport equipment are being provided by the agencies interested in the development of sports to see their nation at the top of the medal winning country in world competitions.

A lot of research is being done on all aspects of sports performance. Numerous physical educationists and scientists are engaged in finding new dimension for talent selection for better performance. It is due to their sincere efforts. The records of the performance in any games and sports are being broken day by day and new records are being established.

Parnell (1951), Tanner (1964), DeGaray et al. (1974), Hirata (1979), Kansal (1981), Uppal and Roy (1986), Chauhan (1986), Sodhi (1991) etc, have given the characteristics of various sportsmen for different events.
Measurement of body size includes such descriptive information as height, weight and surface area. While measures of body proportions describe the relationship between the height and weight among lengths, widths and circumferences of various body segments.

It has been observed that top athletes in sports tend to have those proportions that biomechanically aid the particular performance required (Zeigler 1982). An evidence of this, can be observed amongst the well-proportionate Physiques’ of boxers and Gymnasts. The solidness of top football player and the leanness of champion distance runner and massive builds of great shot-putters and Discus Throwers (Clark and Clark, 1967).

Inter-relation between the physique and performance has led to more systematic examination of the physical requirements necessary to achieve top performance. The main aim of the sport and physical educationists working in this field is the determination of the optimal indices of the physique for the particular sport disciplines and event, as well as the presentation of morphological differentiations occurring among them.

Medallist performances no longer occur at random or as a result of chance alone. International level sports performance in various game and sports are influenced by many factors such as level of physical, physiological and psychological abilities, technique, tactics, physique, body size, body composition etc. Tanner (1964) has shown that those
who became the best in the world in 1960 Olympic, had definite body characteristics that were clearly specific for the different events in which they competed. There is a wealth of scientific and empirical evidence to support claim that there are body difference among athletes in different games and sports and among events within the same sport. The age, physical structure and body size of the national athletes is of interest. Chronological age of the top class athletes indicated the time at which peak performance might be expected. In different sport disciplines peak performance age is also different. It is lower in case of swimming, and higher in Track and Field athletes and still higher in athletes of team sport disciplines.

Peak performance age in different sports disciplines is associated with the time to start sports training in a particular sport discipline and required to develop the necessary, conditional, tactical, technical abilities and sports performance. With regard to weight, height, body size, body composition, certain dimension is necessary for success in selected events and sports. Age, height, body weight, body size and body composition of the Olympic, International and national athletes have been subject of great interest for many research workers.

have reported anthropometric data on Olympic athletes. Sidhu and Anand (1971). Muthiah and Venketswarh (1973), Kansal (1980), Grewal (1983), Shrama and shukla (1989), Debnath and Bawa (1990), Kaur et. al., (2002), and Chauhan (2004) have reported data on the national athletes Age, body Size and body composition of the sports women belonging to gymnastics, swimming (Sprinter only) and athletics (sprinter only) differ from each other. Sprynova and Parizkova (1969) reported that female gymnasts had lesser stature when compared with female swimmers.

Salmela (1980) also reported female gymnasts as smaller and lighter than most of the other Olympic athletes of 1976 Olympic. Hywood, clark and meyhew (1986) reported that girls who regularly participated in gymnastics were shorter and lighter both in over all weight and lean body mass than the swimmers.

Parizkova and Poupe (1963) reported a means value of 9.6 percent relative fat for highly trained European female gymnasts.

Wilmore (1982) the appropriate, size, shape, build and composition of the athlete’s body is of major importance in almost all athletes Endeavour’s. Each athlete has a genetic profile that largely dictates limits for both body build and composition. While studying the role of various factor in swimming performance.
Parizkova et al. (1987) reported that female swimmers had the highest body weight and fat percentage while gymnasts and distance runners had the lowest among all athletes.

Eiben (1981) studied about the female athlete’s, size, shape and body composition and reported that female sprinters were smaller in stature than female hurdlers, jumpers and throwers. DeGarayet al. (1974) in a study conducted on 148 Mexico Olympic athletes, reported that female gymnasts, divers, sprinter and swimmers averaged close to 3 units in ectomorphy and were significantly more ectomorphy than canoeists and throwers.

From the above cited literature and investigation, it is evident that there is a difference in physique, body size and body composition among international and Olympic female gymnasts, swimming, sprinters and track sprinters. The present investigation has been conducted with an aim to find out significant difference in age physique, body size body composition and somatotype variables among elite female Indian gymnasts, swimming sprinters and track sprinters.

In recent years, the measurement of the percent body fat has become widely used and recommended as one of the indicators of fitness by monitoring percent body fat and weight regularly. There are many things a person can learn about this fitness and any changes in fitness as progresses that can not be learned the most important things the
monitoring of percent body fat will determine while weight is factor in determining health and fitness, consumers want to know how much their weight is body fat. There is some procedure or methods by which we can know about the fat % in our body. Like hydro densitometry, water displacement method, ultra sound technique, bioelectric impedance method, height-weight chart. Skin fold caliper and girth method etc.

According to research finding we found skin fold caliper and girth measurement were the most reliable process after under water weighing for measuring the fat percentage in our body. Out of these two method girth measurement are easily to use, inexpensive and easily accessible and time saving process. But it is also a fact that long distance runner body structures varies from place to place and competitions, high level and low level. So a new equation for Indian athletes is required.

This idea motivated the researcher to modify and validate the girth method for India long distance runners.

Psychology

A precondition for sports performance ability in competitions is psychological load strain and competition stability. This is a complex quality which is determined by the state of training and development of character trait. The specific psychological load strain of an athlete is developed by the demands of training and competition. Each test
situation in sport confronts the athlete with various external (competition atmosphere, conditions opponent, spectators) and internal (nervous tension, excitement, joy, fear) influences.

These release psychological reactions, which either favour or impede performance. The state of the athlete prior to the start is an expression of psychological strain. Here it is clear how an athlete comes to terms with the various influences. The optimal state prior to the start is controlled excitement and tense expectation of the start.

The athlete is favourably turned to the competition in a way that promotes performance. Athletes who do not meet up to their performance expectations usually have not been able to come to terms with the psychological strain prior to or during the competitions and have failed on account of nervous failure. The inability to mobilize performance potential psycho-physical in competition, to release and exploit reserve can also be attributed to the fact that the psycho-physical demand of competition have not been trained to a sufficient extent in training. In the process of training to athlete it is a matter of using the influence which favour performance (stimulus) and reducing and eliminating those which impede performance.

The influences which favour performance have been demonstrated frequently they are, for example, high but realistic
performance demands. Good previous training and competition performance, success, spectators and trust in the trainer. The influence which mainly impede performances, are excess nervousness, fear, feeling, poor previous training and competition performance, disagreement with the trainer, etc.

Improving psychological strain, load and stability comes about mainly in training and competition. Specific demands on performance ability in training and competition and on the athlete’s attitude and readiness to perform result in conjunction with relevant evaluations in opportunities for further improving psychological load strain potential.

Performance motivation influences the aims and content of an athlete sporting activity and the intensity with which he uses his strength. It also has a substantial influence on will-power and performance behavior. It is a precondition for success in sports. Knowledge and conviction of the usefulness of sporting activity are a point of departure for developing and improving performance motivation.

Success and failure can have positive or negative effects on psychological constitutions; fundamentally success can be attributed to test situations which have become to terms with in a positive manner. These have a positive effect. The contrary is the case when success
leads to over-evaluation, feeling of superiority and bad training. Allure has a mobilizing effect when the athlete draws the correct consequence, when he feels motivated and eager to prove what he can achieve.

Will power is at the heart of character. It is closely linked to other psychological phenomena (temperament, feelings, habits) and in particular to convictions, view of the world and morals. Feeling of responsibility vis-à-vis, the state the sports team, the trainers’ collective group and the individual trainer are forces which exert a strong influence on will-power.

Tenacity and ability to over come difficulties are the hallmarks of will power. Usually sporting activity is linked to over coming difficulties. Particularly before and during competitions various and in part extreme physical and psychological difficulties and strain appear (excitement, inhibitions, fear, exhaustion, disappointment, opponent, unfavorable competition conditions) all of which the athlete must over come to attain success.

A Player is psychologically fit for the game if he posses the required perceptions like emotional stability, motivation, intelligence and educability to accomplish the task. Tension and anxiety can become barriers to performance.

Psychological factors effects the performance of an individual and of the whole team members. Alderman (1974) while emphasizing the psychological factors comments, one essential point which must be stressed is that regardless of how much ability, skill and fitness level and athlete possesses for a particular sport task, and aim, the success or the quality of his performance will in the final analysis probably depend on his particular psychological make up.

Research in the field of psychological difference among athletes and non athletes were undertaken by various investigators, Schendel (1965) compared the persons and social characteristics of ninth and twelfth grade athletes and non athletes and found more positive personal and social characteristics in athletes as compared to non-athletes.

Koening (1969) reported that high school basket ball girls possessed a higher positive self-confidence than the non participants. In another study it was found that the college athletes had higher positive self-confidence than the non-athletes (Schendel, 1970).
The significance of psychological factors for improving performance has been forcefully advocated by many experts (Singer and Kane, 1975, Wein, 1973, Brooke & Whiting, 1975, Bull, 1995). They suggested that individuals are affected not merely by their physical, technical and tactical qualities but also by their psychological make-up.

Some other researchers have given importance to psychological factors in the field of physical educations and sports (Tutko and Tosi, 1976, Vellerand, 1983).

The significance of sports science was, first of all, identified by the scientists of former German Democratic Republic, and U.S.S.R. They made invaluable contribution for the development of sports performance (Bilodiau, 1966; 1969; Poulston, 1974; Singh, 1984). Sports performance is complex and multidimensional in nature. It is the process of tackling given sports tasks.

Competitive trait anxiety is a concept, which denotes how anxious an individual typically becomes in competitive situation. It reflects an individual’s tendency to perceive competitive situations as threatening (Martens, 1977). That is intense competition creates varying levels of anxiety within performers.
Some performers react adversely to the competitive situation by reaching states of hyper anxiousness which often result in the inability to achieve optimum level of performance (Martens, 1977) defined competitive trait anxiety as the relatively stable disposition of an individual to perceive threat in competitive situations. Martens developed the sport competition anxiety test (SCAT) in order to provide a reliable and valid instrument which is a situation specific anxiety (A- Trait) construct to measure competitive trait anxiety. It was hypothesized by Martens that persons high on competitive trait anxiety would respond in competitive situations with higher levels of anxiety than persons low on competitive trait anxiety.

Launess A.D. and Nation R. (1989) after a wide overview of theoretical models of anxiety, underline the real issue for the coach or practitioner is identifying the level of tension that maximizes the athlete’s attention and maintains the concentration: anxiety from their point of view is often and individual answer several recent papers on sports psychology related anxiety to different situation. The relationships among competitive orientation, sport confidence self efficacy performance and anxiety in long distance runners are the object of an interesting paper (Marten and Gill, 1990) for anxiety measuring CSAI 2 was used (Marten, 1990) which is useful to asses
precompetitive level of state anxiety (the 3 subscales represent cognitive anxiety, somatic anxiety and confidence).

Relationship among cognitive worry, somatic anxiety and self-confidence were examined through physiological measure and performance, prior to during and after a bicycle competition. Finding support the prediction that competitive state anxiety is a multidimensional construct with related component that are influenced differently by competitive conditions and task demands (Caruse et al., 1990) in this study the relationship between anxiety and performance remained elusive.

Anxiety is a complex emotional state characterised by a general fear usually accompanied by tension, it is related to apprehension of fear and its frequently associated with failure either real or anticipated (forst 1971).

The problem of anxiety has been considered important in all areas of human activity including sports. The study of the effect of anxiety on motor performance has become a topic of interest to sport psychologists. A number of theories exist concerning the effect of anxiety on performance. Anxiety is greater in individual sports participants than those in team sports. In an individual sports success of failure lies solely with the individual participants. Whereas in team
games error go unnoticed because of the general activity of the contest and more over success and failure are commonly shared considering.

Self-concept is the way in which the individual thinks/perceives to himself (Symonds, 1951). Self-concept has been defined as individuals perception, attitude and feeling about him self (Guilford, 1966). Alderman (1974) has defined self-concept in terms of personality traits such as self-confidence, self-assurance, self-consistency, self-assertiveness, self-esteem, self-regard, self-enhancements and self-respect.

Robazza and Bortoli (1998) conducted extensive interviews with all 8 members (Aged 18-36 years) of the 1966 Italian Olympic Archery Team regarding psychological factors associated with excellence and mental preparation strategies adopted during competition. Hierarchical inductive analysis revealed that positive expectations, concentration, facilitating emotions, body awareness and technical preparation were the mental aspect described by Archers necessary for effective performance.

Further more, the archers outlined a variety of mental preparation strategies including, (1) Autonomic control, (Emotion control, somatic control, internal dialogue, and focus on shooting): (2) Imagery (Visualization, self, talk): (3) Task focused concentration (Body and
Action control, thought control): and (4) Reaction to mistakes (Focus on
correct execution, mistake disregard, shooting analysis).

**Self-Confidence**

In recent years researchers have become increasingly interested to
know whether the personality characteristics are related to the athletics
performance. An analysis of determinants of athlete’s performance and
discussion with participants in a number of sports from recreational to
national competition, suggest that ‘desire to win’/will to win & self-
confidence are important factors in athletics performance.

Self-confidence refers to an individual perceived ability to act
effectively in a situation to overcome obstacles and to get things go all
right. Self-confident person perceives himself to be socially competent,
emotionally matured, intellectual adequate, Successful satisfied, decisive,
optimistic, independent, self relation, self-assured, forward moving fairly
assertive and having leader ship qualities.

Self-confidence has been the subject of much in recent years in
sport psychology literature. One recent concern of those studying self-
confidence has been the charge that female tend to demonstrate less
confidence than male (Lirgg 1991).

A lack of confidence decreases the likelihood that one will choose
to do activities in particular area and also leads to decrease in one’s
persistence and effort in the face of difficulties thus limiting opportunities for improved.

Edwards & Hardy (1996) mentioned that research has indicated that self-confidence is an important predictor of performance that is at least partially independent of cognitive anxiety. This research backs my hypothesis that confidence affects performance outcome.

George (1994) stated that over the past three decades, the construct of self-confidence has received a lot of attention from sport science researchers. Self-confidence is one of the most frequently cited psychological factors thought to affect athletics performance and it has also been called the most critical factors in sport (George 1994). A lot of research on self-confidence has examined its relationship with motor performance.

As an athlete and possible future coach, researcher feel that it is necessary to find out the importance that confidence and self-efficacy has on performance. It is also necessary to find out what degree of importance this effect has on an individual athlete.

Players are always looking for ways to succeed, and if along the way they discover ways that hinder their athletics performance this too can create a successful athlete.
These researches prove that Anthropometrical and psychological measures play a vital role in running in different level competitions. The physique, psychology and body compositions including size, shape, mental presentation and form are known to play significant role in this regard. Though the performance of long distance runners is also dependent on their technique, training, motivation level and several other factors of physiological, psychological and biomechanical nature i.e. Age, sex, physical and mental growth but body structure plays a very significant role in determining human movement. A particular type of structure predisposes an individual to better particular type of movements. For instance a national long distance runners and state long distance runners are quite similar to one another but state long distance runners are shorter than all India intervarsity long distance runners. State long distance runners have shorter lower extremities. National long distance runners’ chest breadths are broad, have proportionally similar trunk, long lower extremities and lighter in relation to structure.

In this study researcher had attempted to highlight anthropometrical and psychological differences among long distance runners at different level of competition. This research study will provide appropriate physical and psychological characteristics to coaches for identification and promotion of long distance runners in different level of
competition as per their body structure and psychology, for building a good team.

**LONG DISTANCE RACES:**

Run longer than 3000 meters is considered as distance event. The most common distance races are 5000 and 10000 meters. The marathon race is one of the examples of long distance race, which take place on paved roads over a course of 42.195 km (26 mile and 385 yd). Most of the best distance runners are small and light-framed. They use a running style that avoids excess motion. Knee action is slight, arm movements are reduced to a minimum and the strides are shorter than those used in sprinting or middle-distance running. Along with fitness, strategy is also very essential for competing in long distance events. The top racers use a variety of techniques to outperform their opponents, from abrupt changes of pace during the race to fast finishing kicks.

**BODY PROPORTIONALITY**

The relationship of length to width, height to thickness, length-to-length etc. of various parts of body represents proportions. This importance of proportion becomes evident, when we want to compare particular body parts of two persons who are otherwise different in over all size. The proportions or ratio keeps one measurement constant
in all subjects compared and evaluate the differences in the other measurements.

STATEMENT OF PROBLEM

After going through the literature and objectives of study the problem under investigation was stated as “A comparative Study of selected anthropometrical and psychological variables of athletes at different level of competition”

OBJECTIVES OF THE STUDY:

To study the anthropometrical and psychological variables of long distance runners competing at different level competitions.

HYPOTHESES

After a painstaking review of the related literature and keeping in view the objectives of the study, it was hypothesized that the significant differences will be observed between the anthropometrical and psychological variable of long distance runners at different level of competition.
LIMITATIONS

The lifestyle, habits, hereditary factors, nutritional intake, psychological traits of subjects was beyond the control of researcher. They have been considered as limiting factors of this study.

DELIMITATIONS:

1. The study was confined to male long distance runners.
2. The subject’s age ranged from 18 to 25 years.
3. The study was confined to only those males who, had participated at the level of all India intervarsity, national and state level competitions.
4. The study was further delimited to anthropometric measurements, such as linear measurements, girths, diameters and skin folds measurement.
5. The study was confined only to two psychological variables i.e. Competitive Anxiety and Self-Confidence
6. The selected anthropometrical variable were measured with the help of anthropometric rod, steel tape, vernier calliper, chest calliper, sliding calliper and skin fold calliper.
(A) Following anthropometrical variables of long distance runners at different level of competitions were measured.
1 - Weight
2 - Stature
3 - Sitting height
4 - Upper arm length
5 - Lower arm length
6 - Upper leg length
7 - Lower leg length
8 - Foot length
9 - Chest width
10 - Shoulder width
11 - Hip width
12 - Humerus bi epicondyle diameter
13 - Femur bi epicondyle diameter
14 - Ankle width
15 - Wrist width
16 - Biceps muscle girth
17 - Calf muscle girth

18 - Thigh muscle girth

19 - Biceps skin fold

20 - Triceps skin fold

21 - Suprailliac skin fold

22 - Sub scapular skin fold

23 - Calf skin fold

24 - Thigh skin fold

25 - Body Composition

26 - Proportionality in ratings

   I. - Sitting height-Stature index

   II. - Ponderal index

   III - Thigh length- lower leg length index

   IV - Upper arm length-lower arm length index

   V - Hip width-stature index

   VI - Shoulder width-stature index
Following psychological variables of long distance runners at different level of competition were taken for study.

1 - Competitive anxiety

2 - Self-confidence

SIGNIFICANCE OF THE STUDY

To reach the highest levels of performance, an athlete has to pass through the various levels of competition, this study would provide the guidelines to coaches and physical education teacher and sport scientists to understand the different anthropometrical and psychological traits of India long distance runners.

It would also provide an idea in talent selection of long distance runners. The findings of this study will be useful to athletics coaches and talent hunters as hard empirical facts obtained can form the basis of talent selection for different level of competition in athletics. It is also to be noted that not much empirical work has been done to study the anthropometrical and psychological differences between long distance runners of different level of competition of India. This research shall highlight the anthropometrical and psychological characteristics of long distance runners. It shall also show the physique and mental make up in relation to the mechanical requirement of the two categories of long
distance runners of different level of competition. As anthropometrical, physiological and psychological differences exist among long distance runners who play in different level of competition, these differences fit with their different workload demand in the game. Therefore, training programs should include specific sessions for each positional role. So that children with these inherited physical and psychological characteristics may only be recommended for long distance running.

The study may motivate the others to take similar studies at different age levels so that long distance runners in India may become more and more scientific and result oriented.