CHAPTER - I
INTRODUCTION

With the improvement in sports participation in the recent years, the performance standard has also increased, which led to the sports scientists to think on the various possible ways to further improve the performance. In competition difference between the winner and the loser can be a matter of not more than a few centimeters or a fraction of second. Therefore, at all levels, sports scientists tries to leave nothing to chance. However, sports performance depends on many factors. The percentage contribution of various performance factors are complex combination, which depending upon the nature of activity.

Growth of sports and physical education program in any country depends upon the development of sports science. The sports science constitutes relatively new area of research to have better results in sports and increased value of position in international medal tally. The standard of sports and competitive performance can develop through integral approach by the use of knowledge form both applied and basic sciences. Sports science cover a great number of research opportunity in many scientific spheres like anthropometry, exercise physiology, bio-mechanics, sports psychology, sports biology, sports medicine, sports sociology, kinesiology and anthropology etc. The fields of application of sports sciences are numerous where sports science can be applied.

Modern qualified sport involves constant improvement of effectiveness of the process of athletes’ training and obtaining high sport
results. The modern scientific and technological development allows this process and facilitates solving practical problems in sport. One of the most fundamental issues in today’s contemporary sport is the search for the most effective means of selection of future athletes. The process of selection should account for proper differentiation between athletes and correct identification of the most outstanding candidates for further training leading to the championship level. In this opinion, a number of earlier studies concerning selection in sports focused on the so-called “championship model” for particular sports. By way of observations and examinations of sport champion, the authors defined athletes’ major traits and qualities. They assumed that achieving the critical values of the “championship model” was necessary and entirely sufficient to ensure success in sports competition. The assumption can be accepted in some sports, e.g. individual sports, but not team sports, where cooperation and interaction in changing situations as well as social and organizational effects are involved. The championship model approach excludes the phenomenon of “equifinality”, thanks to which players with different structures of traits, abilities and talents achieve similar sports results. Ontogenetic identification of children and adolescents with abilities or talents for sports from the auto telic stand point has been subject to numerous research studies in the areas of anthropometric or physical. He further discusses that proper multi level selection of talented youth is one of the fundamental aspect of qualified sport. The common auto telic approach for the selection in sport, based on the measurement of individual traits and abilities and excluding any pragmatic aspects of different sports seems highly insufficient today. Each specific sports
features its own factors affecting athletes’ development and constituting important selection criteria. Thus a hetero telic approach accounting for the specificity of different sports allows on to genetic profiling of young talented athletes in view of their dispositions to act under varying circumstances. He verified theoretical model of holistic perception of playing dispositions by way of inter dispositional identification of candidates. According to him each player featured a specific structure of traits and abilities understood as playing dispositions. It is assumed that individual dispositions can be under different circumference and to a different extent combined into more complex structures called inter disposition. He concluded that the exemplification of the theoretical model showed that playing dispositions could, and should be studied in an interdisciplinary manner. The holistic approach to the player’s individual traits makes his or her profiling more comprehensive, which affects the development of skills and performance assessment method (Edward Superlak, 2008).

The selection and development of talents in sports has been gaining greater emphasis. Of course, it involves integral approach of different sports science specialties. However, the role of anthropometric as a sports science is perhaps one of the most crucial in this regard. It is essential because the physique, body composition, Physical growth and one’s motor development are of fundamental importance in developing the criteria of talent selection and development in sports (Sodhi, 1991).

The female volleyball players of various age groups differ significantly
according to the variables assessing the longitudinal skeleton dimensionality, and body mass and volume, as well as in all tests used on volleyball technique evaluation. Factor analysis of morphological measure applied across all age groups generally yielded two morphological structures: the one determined skeleton development, i.e. longitudinal and transverse bone growth, and another one determined by soft tissue development, i.e. muscle and adipose tissue growth. Results of regression analysis revealed the longitudinal skeleton dimensionality to significantly determine the block technique performance across all age groups, and to a lesser extent performance of the spike technique in the 14-15 and 16-17 age groups. Regression correlation analysis also should be based on the predominance of longitudinally to be a significant positive predictor of situation performance in all age groups. The female volleyball player were tall, slim, with well developed muscle, with broad shoulders and thus relatively narrow hips, with long upper and lower extremities with the minimal thickness of subcutaneous fat and relatively low weight, with adequately developed skeletal structures and a relatively high foot arch. These characteristics are considered positive in young females from the standpoint of physical beauty, efficiency and health. Simultaneously the girls developed skillfulness, readiness, elasticity and team spirit; because volleyball as a sports discipline demands and develops all the qualities in participating players. However in their opinion, it is very difficult to conclude to what extent the above properties were reached by training only, and in which part genetic endowment and selection played a role (Katie et. al. 2007)

One may not take it guaranteed that every child can be trained to be
an Olympian of development of each requisite factor developed to the highest degree. The idea is to put the interested individual in a game or event in such a way so that one gives out the best of one’s abilities. In this connection, the role of Physique is of utmost importance. There seem to be various unchangeable characteristics in the human body. For example, if the game of basketball needs the players to be tall, then those who are shorter cannot be made more tall under normal conditions. Further if the sport of gymnastics need the players to be short, than those growing taller cannot be made shorter. Similarly the length of arms, legs etc. cannot be changed. To excel in a physically competitive sport, the player must possess such dimensions of body characteristics which suit the most in her/his sports. It is, therefore, because of this reason, the anthropometric or physical characteristics are known to be of fundamental importance for individuals development to achieve Olympic level performance in a sport. The physique which includes the evaluation of size, shape and form of an individual is of prime importance as to know how far an individual can succeed in becoming a top athlete (Sodhi, 1991).

The physical fitness is a prerequisite for learning as well as for the successful development, completion and displaying owing to fatigue and exhaustion. In these days, competitions at the top ranking level are very tough and contested closely. So, for attaining top position in high competitions, an athlete has to tolerate the high pressure training load everyday. Tolerance of high pressure training load depends on the ability of any athlete to recover quickly. Therefore, better the physical fitness, quicker will be the recovering ability. Hence, at the advance stage physical
fitness is directed towards the perfection of technique tactics and its effective use during training as well as competition.

Physical fitness is most appropriately considered as the ability to carry out daily tasks with vigour and alertness without undue fatigue, with ample energy leisure time pursuits and to meet unusual situation and unforeseen emergencies. Thus, physical fitness is ability to last, to bear up, to withstand stress and to pressure under difficult circumstances where an unfit person would be in ineffective and would quit. This definition implies that physical fitness is more than “not being sick” or merely being well it is a positive quality extending on continues from death to abundant life. Thus, living individual has some degree of physical fitness, which is minimal in severely and maximal in the highly trained athlete. It varioes considerably indifferent people and in the same person from time to time (Clarke, 1967).

Suggest that some of the physical and physiological parameters typically improve with increases in playing level male players are agility, muscular power and estimated maximal aerobic power than female players. Given the improvement in lower body muscular power, agility and estimated maximal aerobic power with increased playing level and given the importance of these qualities to competitive performance, conditioning coaches should train these qualities to improve the playing performance of junior volleyball players (Gabbett, T. and Georgieff, B. 2005).

A similar view that if significant correlations between a trait or ability and effectiveness of action are observed, then such traits or abilities are understood as dispositions to practice a given sport. An important aim
of studies facilitating solution of problems in modern sports is the heterotypic approach which highlights young players’ predispositions, dispositions and inter dispositions specific for a given sport. The physiological scientists have been of the view that anthropometric and physical variables of athletes have a more significant role in their performance, than the tactics and techniques used by a person or a team. The research findings indicate that a high level of technique perfection has less to do with the success of an individual or a team in modern competitive sports if it is restricted by anthropometric and physical limits (Panfil, 2006).

Modern cricket has developed from a crude game which was played as early as the 12th century; but the first real cricket club to be established was the Hambledon Club, which flourished in the second half of the 18th century. This was followed in 1787, by the Marylebone Cricket Club, which later made its headquarters at Lord’s in St. John’s Wood, London; and since that day the M.C.C. has been the recognized authority on all cricket affairs. The game was originally played on ordinary English meadowland, with long uncut grass for the outfield, and only the actual pitch was scythed. Cricket is being played in two forms, i.e., Test Match and One Day Match. There is no limit of overs in test match cricket and the game continues till 5 days while in one day match overs are limited to 50 and result of the game declares in the same day. Game is played between two teams each consisting of 10 players including a captain and a wicket keeper and 5 substitutes. In order to decide which team will bat first, a toss is made and the winning captain can opt to bat or bowl first. The basic aim of team batting first is to score maximum runs in time and overs specified while the aim of bowling side is to take opponent team’s wicket quickly and
to make scoring runs difficult for them (Srivastava, 2007)

Physical performance is of central importance in many competitive sports. The level of performance in top international competition is increasing rapidly by developing the required abilities and qualities of the sportsperson. The peak performance of a player in a competitive sport is reflected through one’s level of tactical, technical and physical abilities at the time of high ranking competition. An athlete can learn better technique, effectively perform the tactics and attain a high status of physical fitness, within genetic limits, by making use of improved sports facilities motivation and better nutrition (Tanner, 1964 and Hirata, 1979).

Developed three physical fitness test batteries for different categories. First is the elementary school physical fitness test, second is the junior high school physical fitness, and third is the high school and college student’s physical fitness test. These batteries covered five components of physical fitness test. Items are overload full test modified push-up, modified set and reach and 600 yard run/walk. The junior high school physical fitness has spring scale press test for boys and two hand push-ups for girls and chin-up for boys and flexed arm hangs for girls, modified sit and reach, chin-up for men and flexed arm test for women and 12 minute run walk test (Johnson and Nelson, 1982).

Physical abilities play an important role in physical activities, and their importance is revealed to a great extent in sports and games involving efficient footwork and quick change in body position. Thus motor fitness and competitive performance go hand in hand with athleticism. Superb fitness level is a pre requisite in training for competitive sports. Apart from these factors most of the sports activities require greater amount of speed, strength, endurance, flexibility, agility, coordination and appropriate total
fitness of the organism at the higher skill levels, technical performance may be limited by physical characteristics as well as physical fitness, and performance characteristics such as speed and vertical jump. According to them that either years of specific physical conditioning and playing or the selection of individuals for the national team who possess more desirable characteristics as a consequence of genetic endowment, plays a significant role in the preparation of international caliber volleyball player (Barrow and Me Gee, 1979).

Physique assessed through measurements reflects the visible morphological configuration of the body. Physique, which generally refers to the shape, size and form of a person, is of course influenced by the genetic composition and environment. For this reason human physique differs many ways and variations in physical outlook of human in one way are an interesting project but in other way its importance in sports is a prerequisite demand which definitely helps to attain better performance. Every game requires a particular type of body and unspecific body types in relation to the sports event may be hindrance in the improvement or achievements of an athlete’s performance. Various researches suggest that the suitable physique plays a predominant role for success in sports (De Garay et. al, 1974 and Sodhi & Sidhu, 1984).

The degree of fitness one has to develop and maintain depends upon the profession of the person. The needs of the individual are to be taken care of, a high performance athletes need much more physical fitness than a class room teacher, a doctor, an official or scientist all need physical fitness, so that the body may sustain the demands of the intellect. The degree of fitness differs from person to person, the fitness of healthy man of
eight years age is entirely different from that of young sports man (Edmundson, 1983).

SKILLS OF CRICKET

(1) Batting
(2) Bowling
(3) Fielding
(4) Wicket keeping

(1) BATTING

Batting skills is the column of strength for a good cricketer because the runs are to be scored and match won. A good grip and a proper stance at the crease play a significant role in learning and performing various strokes most successfully. Batting is the major skill of cricket. It is the procedure of hitting the ball for scoring runs. There are two types of Batting strokes: (1) Defence Stroke (2) Attacking Stroke.

RELATED TO SKILL

Motor ability components play a major role in batting skill. Strength in shoulders and arms, trunk and hip flexibility are the pre-requisite for a batsman. Quick reactions, agility, eyes and foot co-ordination during batting are also pre-requisites to become a batsman of good standard.

(2) BOWLING
Cricket is nothing but a constant tussle for supremacy between the batsman and the bowler, is not secret. Good bowlers are therefore, no less important than good batsmen in a team. Good bowling requires direction and length as essentials while direction can be acquired quite easily, acquiring length requires persistent practice. Bowling is roughly divided into three categories, fast, medium and slow, subdivided by right handed and left handed, while fast bowling is shock tactics, pure and simple, the slow or spin bowling is guile or deceptive tactics. The medium bowling is a mixture of the two.

RELATED TO SKILL

Bowlers require strength in muscles of trunk, shoulders, arms and legs, including flexibility, speed and endurance.

(3) FIELDING

Fielding is another important compartment of cricket comprising mainly catching, stopping and throwing the ball. Batsman and bowlers of high quality may be born not made, but anybody with normal eyesight, sound in mind and limb and, above all, keen can make himself a fielder. Fielding is basically a skilled activity. Anticipation, alertness and constant watch fullness are excellent qualities of a good fielder.

Catching:- Catching is to take hold of the ball after it has been hit by the batsman and before it has made contact with the ground.
Stopping and throwing: Based on natural motor skills, stopping and throwing. This is basic to fielding and must be practiced vigorously. Stopping is either defensive or attacking.

RELATED TO SKILL

Various motor ability components i.e. strength, flexibility, speed, endurance, ability in shoulders, arm, trunks, legs, wrist etc. play a major role while performing fielding skills.

(5) WICKET KEEPING

Wicket keeping is a specialist fielder behind the batsman’s wicket whose job is to stop balls the beat the bat, catch balls coming off the edge of the bat, and when possible effect stumping and run-outs position of wicketkeeper is according to the pace of the bowler.

RELATED TO SKILL

Wicket keepers need specific strength in legs, flexibility in trunk, reaction ability, and proper co-ordination of body segments.

Therefore, cricket apart from being a game of chance, is a difficult game and very high condition of physical fitness, concentration and determination are required to achieve some kind of mastery and ability to do things right, and no matter how much effort and time one may have already spent, there is always hope to learn (Canaway, 2005).

STATEMENT OF THE PROBLEM
The research problem of the present study has been stated as under:

“Prediction of Anthropometric Measurements and Physical Fitness Components to the Performance of Women Cricket Players”.

OBJECTIVES

1. To examine the relationship of selected anthropometric variables and performance of women cricket players of different categories.
2. To predict the performance of women cricket players on the basis of selected anthropometric variables.
3. To predict the performance of women cricket players on the basis of selected physical fitness variables.
4. To find out relationship between selected physical fitness variables and performance of women cricket players of different categories.
5. To find out relationship between combination of two or more selected anthropometric variables and performance of women cricket players of different categories.
6. To examine relationship between combination of two or more selected physical fitness variables and performance of women cricket players of different categories.

HYPOTHESES

1. There would be significant relationship between selected anthropometric variables and performance of women cricket players of different categories.
2. The Performance of women cricket players (of different categories) can optimally be predicted on the basis of selected anthropometric variables.

3. There would be significant relationship between combination of two or more selected anthropometric variables and performance of women cricket player of different categories.

4. There exist significant relationship between selected physical fitness variables and performance of women cricket players of different categories.

5. The performance of women cricket players can optimally be predicted on the basis of selected physical fitness variables.

6. There would be significant relationship between combination of two or more selected physical fitness variables and performance of women cricket players of different category.

DELIMITATIONS

1. The study was delimited to women cricket players in the age group of 18 to 25 Years.

2. The study was delimited to those players who have participated in North-East Zone women cricket competition.

3. The sample of study was consisting of 200 women cricket players.

4. The data was collected during the session of 2008-2009.

5. The study was restricted to the physical fitness variables (Speed, Flexibility, Endurance, Agility and strength).
6. The study was restricted to anthropometric variables of length, width and circumferences of body parts.

**SIGNIFICANCE OF THE STUDY**

The present study was to equip the selectors to select the cricket player by predicting their performance. The results of this pioneer study is expected to be very useful for the general population, coaches, physical education teachers, sportsperson and sports scientists, for the selection of players. The results in addition to their educational significance will also prove helpful for the women cricket players. The present study will be helpful for coaches and selectors to the individual according to their playing categories. The results of study help to find out study relationship of anthropometric variables and physical fitness variables with the cricket performance variables.

**EXPLANATION OF THE TERMS**

1. **ANTHROPOMETRIC MEASUREMENT**

Anthropometric measurement, the science of measurement of the human body, is not merely an ensemble of techniques and measurements, but it is a powerful method for description and analysis of body size, shape, form and proportion *(Surinder, N. 1993).*

2. **PHYSICAL FITNESS**

Physical fitness is the ability to carry out daily tasks with vigour and alertness without undue fatigue, with ample energy to enjoy leisure time pursuit and meet unforeseen emergencies, *(Clarke, H. H. 1978).*
3. **SPEED**

   Speed is the capacity of an individual in the rate of making successive movement of the same kind in least possible time, *(Meyer, 1974).*

4. **FLEXIBILITY**

   It is ability of an individual to move the joints through a maximum range of motion without undue strain, *(Miller and Allen 1982).*

5. **ENDURANCE**

   Endurance is the athlete’s tolerance level against fatigue in strength performance of longer duration, *(Harre, 1982).*

6. **AGILITY**

   It is the ability to change the direction of the body or of parts of the body rapidly, *(Mc Cloy and Young, 1954).*

7. **STRENGTH**

   It is the force that a muscle or group of muscles can exert against resistance in one maximum effort, *(Mathew and Fox, 1976).*

8. **DIFFERENT CATEGORIES AS GIVEN BELOW:-**

   (1) All Rounder (2) Batsmen (3) Medium Pacer (4) Spin Bowler

   (5) Wicket keeper