

## CHAPTER I

### INTRODUCTION

Sport plays a very prominent role in the modern society. It is important to individuals, a group, a nation and indeed the world. Throughout the world, sport has a popular appeal among people of all ages and both sexes.

“Much of the attraction of sport comes from the wide variety of experience and feeling that result from participation such as success, failure, exhaustion pain, relief and feeling of belonging. Sport can bring money, glory, status and goodwill. However, sport can also bring tragedy, grief and even death”. (Coakley, Jay J., 1998).

The preparation of an athlete today for achievement is a complex dynamic matter, characterized by a high level of physical and physiological efficiency and the degree of perfection of necessary skills, knowledge and proper teaching and tactics. An athlete arrives at this state only as a result of corresponding training sports activity directed at steadily enhancing the preparation of an athlete and grooming him for a higher-level achievement.

“Sport is an important ingredient of physical education and is a worldwide phenomenon today. The unprecedented popularity and better organization of sports activities and competitions would have been impossible without the recognition of the importance of sports competitions in the world. The world has realized the importance of sports for the modern civilizations”. (Coakley, Jay J., 1998)

Fitness is a state which often characterizes the degree to which a person is able to function. Ability to function depends upon the physical, mental, emotional, social

and spiritual components of fitness, all of which are related to total fitness. While fitness is the maximal, economical and efficient functioning of the body, health is referred to as optimal homeostatic functioning of the body.

“Sports is the way which we are, our physical capacities play”. (Bruce Jenner et.al., 1984).

Competitive sports are now main in all nations of the world. Competitive sports have brought into sharp focus the training process as a means of improvement of sports performance.

Sports performance is the result and expression of the total personality of the sportsman. The development of the sportsman to achieve high level of performance is usually concentrated in four areas namely physical power, social adjustment, psychological development and physiological efficiency. Different activity makes different demands upon the organism with respect to circulatory, respiratory, metabolic, neurological and temperature regulatory function. In sports environment, the physical work done by an individual depends upon the nature, the duration and purpose of the activity.

Sports achievements depends mostly on the training designed for a particular sport. If our nation wants to win laurels it must take the challenge seriously in terms of well-developed physical training. From the past experience, we can learn that Indian sports persons are physically as well as physiologically weak compared to the international sports persons. Indian sports persons perform very poor in various field as compared to Russia, U.S.A., Germany who invariably reach the peak performance

due to physical and physiological factors and due to inadequate training and conditioning.

## **1.1 SPORTS TRAINING**

“Sports training is the process of sports protection based on scientific and pedagogical principles for higher performance”. (Hardayal Singh, 1991).

“The Basic training procedures will serve better when utilized with modification suited to individuals or a group dealt with. The training programme should look into improving the performance of the athletes and at the same time should prevent injury from taking place” (Fox, et al. 1988).

Training means a systematic scientific programme of conditioning exercise and physical activities designed to improve the physical fitness and skills of the players or athletics participated. Training involves periodic assessment of the athlete’s status and progress.

## **1.2 HANDBALL - AN OVERVIEW**

“Handball, a popular game throughout the world, was introduced in Germany by a gymnastics teacher, Max Heiser, in 1917. The game was primarily devised for girls and played 11-a-side on a football field. There are, however, authentic reports of a similar game, “Handbold” being played in Denmark as early as 1904”. (Ashok R. Lohar, 1998).

In 1919, another Berlin sports teacher, Carl Schelenz, modified the existing rules. He advocated the use of a smaller ball, the players were allowed to fight for the ball, the three-step rule was introduced and the 16-metre penalty area of the football

field provided an ideal throwing zone. Soon other countries accepted these rules and handball was on its way to becoming an international sport.

In 1923, the first inter-city match between Berlin and Dresden took place, while the first international handball match was played between Germany and Austria on 13 September 1925.

During the Olympic Games of 1928 in Amsterdam, 11 countries got together to found the International Handball Federation (IHF). Along with the increase in members, another innovation took place in the Scandinavian countries, where due to the climatic conditions, handball was taken indoors. The rules were modified and adapted to indoor conditions and finally evolved to the format prevailing today.

“A great boost to the sport was provided when in 1972, handball was introduced as an Olympic discipline at Munich”. (Ashok R. Lohar, 1998).

### **1.3 FUNDAMENTAL SKILLS OF HANDBALL**

#### **1.3.1 Catching Skills**

##### **1.3.1.1 Catching a High Ball**

Use the same position of the body and hands while catching a high ball over head. Keep the body more or less in a straight line, legs straight and arms above the head together. Jump up if necessary to receive the ball. When the ball is caught, bring it into the body quickly so as to protect it from a sudden attack of the opponents for it possession.

### **1.3.1.2 Catching a Low Ball**

Depending upon the situation around, take either a squatting or a straight stance with body weight balanced on the feet shoulder-width apart so as to move away quickly. Lean forward slightly and keep the arms stretched in front. The hands are turned down with fingers pointing towards the ground. Let the ball settle on the palms. Quickly close the fingers and withdraw the arms chest-ward, thereby protecting the ball from the opposition-attack.

## **1.3.2 Passing skills**

### **1.3.2.1 Over-Arm Pass**

From attacker's basic position, swing the ball with the throwing arm up above the shoulder, thus forming a throwing position. The throwing motion starts with a twist of the hip, followed by the whipping motion of the shoulder, elbow and finally the wrist.

### **1.3.2.2 Under-Arm Pass**

Assuming basic position, bring the ball with the throwing arm to hip level next to, and a little behind the body. Keep the right arm slightly flexed with the palm behind the ball, the wrist holding it with the fingers and then forward making a well-sequenced throwing motion.

### **1.3.2.3 Chest Pass**

The chest pass is a simple and accurate technique that makes it possible for to pass the ball safely at a short distance. Assume a slightly transversal straddle and hold the ball tightly in both hand with fingers outstretched, at chest level. Keep the elbows

bent but a bit away so that the ball is close to the body. From here, push the arms forwards straight and release the ball speedily with a wrist snap and finger-flick. In follow-through, keep hands extended and fingers outstretched, pointed in the direction of the flight of the ball.

### **1.3.3 Goal-Shooting**

#### **1.3.3.1 Over-Arm Standing Throw Shot**

The entire action-sequence is similar to that of the shoulder pass except that the ball is to be directed downwards to bounce up off the floor.

#### **1.3.3.2 Under-Arm Shot**

In the throwing position, the player is in a wide transversal straddle with the front leg firmly placed. Depending on how high the ball is held, both legs are to a slighter or greater degree bent with the body-weight mainly on the back leg. The torso, by curving slightly towards the throwing arm, is turned out with the left shoulder facing the throwing direction and the left arm is in front of the body, ready for action. The throwing arm holds the ball out diagonally behind the body at the throwing height.

#### **1.3.3.3 Jump Shot**

From a basic position, start by stepping out with the left leg or while running, catch the ball in such a way that at the first step following, prepare to change the horizontal impetus to vertical. Thus, take a long, diagonal step forward with the right leg while lowering the centre of gravity. The throwing motion is basically the same as in other shots – the most important point, however, being the rhythm. One must be

able to receive a pass cleanly and move smoothly into the permitted steps before taking off into the air after the final step. In this final movement, concentrate on raising oneself as high as possible in order to get the throwing arm over the defensive wall before releasing the ball.

#### **1.3.3.4 Dive Shot**

The dive shot combines the characteristics and techniques of both the falling-shot and the long-jump shot. It can be executed to either side of the throwing arm.

### **1.3.4 Defensive Blocking**

#### **1.3.4.1 Individual Blocking**

The individual blocking technique is used in one-vs.-one situation when the defender has to somehow neutralize a goal shot being attempted by an attacker.

#### **1.3.4.2 Blocking Over-Arm Shot**

From the basic position, raise arms diagonally above the head, at the same time take a little step out. At the moment of blocking, keep the palms opened, fingers stretched, and the muscles flexed, permitting the arms to take the whole impact of the ball.

#### **1.3.4.3 Blocking Under-Arm Shot**

From the basic position, stretch the arm laterally on the side of the shot with an open palm facing the predicted direction of the on-coming ball. Focus on the advancing player timing one's movements in such a way that one check the flight of the ball halfway.

### **1.3.5 Goalkeeping**

#### **1.3.5.1 Basic Stance**

In basic position, the legs are kept shoulder-width apart, feet pointing out a little and knee and ankle joints are slightly bent. Body weight is evenly distributed on the outer-edge of the feet, the torso is straight or a little bent forward with the centre of gravity in the naval area. The head is held high with peripheral vision following the path of the ball. The arms are raised to the sides of the body, bent at the elbow palms above shoulder-height facing the ball.

#### **1.3.5.2 Saving Long Range Shots**

Assuming basic stance, the balls coming at or above shoulder level may be handled with one or both hands. Sometime to put both hands in the path of the ball is quite logical. To save long –range shots the goalkeeper must lift up his arms in the direction of the oncoming ball and simultaneously push off on both feet sideways. At the movement of touching, he should keep his hands together behind the ball to take the impact of the stop and make save safer.

#### **1.3.5.3 One-Handed Saving**

The one-handed saving is resorted to in case of unaccepted shots when the goalkeeper does not have enough time to put both hands together.

#### **1.3.5.4 Saving Medium-High Positioned Balls**

From the basic position the goalkeeper swings the closets arm and leg simultaneously into the path of the ball in such a way that they cover as much surface as possible so as to allow the ball go through.

## 1.4 CIRCUIT TRAINING

Circuit training is very special form of training which concentrates on different parts of the body and general endurance. Circuit training is a method of physical conditioning that employs both resistance training and callisthenic training exercises. The method was originally introduced by Morgan and Adamson in the late 1950s at the university of Leeds, England. The intensity and vigor of circuit training are indeed challenging and enjoyable to the performer. This system produces positive changes in future in motor performance. General fitness, muscular power, endurance and speed have shown decided improvement as well.

Circuit training is based on the premise that the athlete must do the same amount of work within the limits of an assigned training period. Numerous variations of this system are in use, but all employ certain common factors: a circular arrangement of the activities that permits progression from one station to another until all stations have been visited, the total comprising a “circuit” and a limiting time within which the circuit must be concluded.

“Circuit training employs a series of exercises stations that consists of weight training, flexibility, calisthenics, and brief aerobic exercises. In circuit training the subjects can move rapidly from one station to the next and perform whatever exercise is to be done at that station within a specified time period. A circuit would consist of 8 to 12 stations and the entire would be repeated within three of four times, concentrating on the legs, abdomen, back, arms, shoulders and trunk. These exercises should be organized so that the subject moves from one muscle group to another. This method allows working hard on a muscle group and then resting it, while the other groups have their own work out”. (Tancred, 1987).

Circuit Training is an ideal workout on one training day during peak season which envelopes aerobics, anaerobic, strength and jumping agility in a single package. Several trainees can participate in a chain. The circuit work will increase the general work capacity by improving the ability to tolerate increasing levels of muscular fatigue.

The circuit training will have shorter exercise and shorter rest intervals between exercises, thus maintaining elevated heart rates during the circuit workouts and helping to upgrade the cardiorespiratory capacity. Circuit efforts will enhance the overall body strength. The circuit programme will increase the lean muscle mass by a moderate amount and decrease the body- fat levels through high levels of energy expenditure.

## **1.5 INTERVAL TRAINING**

In 1956 Olympic games at Melbourne, four athletes created a new Olympic record in 800 M and nine athletes in 1500 M race. This record-breaking effort in middle distance and many other events has been the recent trend in Olympics and World championships. The scientific training method which was then and is now being adopted as “interval training” specific to each sport.

In interval training aims the athlete to run a particular distance, five, ten or 15 times at the same speed and time. The interval in between each run should also be almost the same and the athlete must learn to judge the speed of run.

Interval training develops the ability of the athlete to run at a particular pace. This type of training by adjusting the time, number and distance of the run can be

adopted to suit the needs of any middle-distance runner. This flexibility is an advantage of training system.

Interval training is a series of repeated bouts of exercise alternated with period of lighter work or rest.

The rest interval incorporated into the interval training allows initially and then reduces accumulation of fatigue products associated with increased energy utilization and cardiac workload.

“The training schedule for one year can be divided into three major components - pre competition season, competition season and off season. In off season and pre-competition seasons the coach should concentrate more on the aerobic endurance and so the repetition of exercise will be more and the time interval will be lesser. In competition season the repetition of exercise will be very less and the interval will be maximum with 90% training intensity. The relief interval training usually is expressed in relation to the work interval. It is a work relief ratio and is expressed at 1: ½, 1:1, 1:2 and 1:3. Thus 1: ½ implies that the relief interval is half the time of the work; 1:1 indicates the relief and work intervals are the same and so on”. (Fox, et.al. 1988).

## **1.6 STAIR CASE TRAINING**

“Training programme which have been used to improve sprinting speed include weight training, wind sprint and stairs sprinting. Such programmes are designed to develop leg strength, leg speed, speed endurance and explosive power”. (Donna Mac Miller, 1974).

Staircase training is a suitable exercise to burn fat and improve the condition of heart and lungs. Staircase training is a creative, fine and very challenging patterns of movement, that is, on and off stair case can challenge the legs, footsteps and arms also.

Correct staircase or stepping technique also prevent injuries and improves performance. Robinson (1971) has provided guidelines for staircase training as stated below.

1. Always place the entire foot on the platform no part of the foot should hang over the edge.
2. Step close to the platform allowing the heels to contact the floor. Note only the ball of the foot not the heel should touch the floor during lunges or other rapidly repeated movements.
3. Step quickly – pounding can unduly stress ankles and knees. Keep an eye on the platform at all times. Don't use hard weights. They greatly increase the risk of injury and provide no benefit.
4. Initially, the athlete finds it difficult to follow the staircase training. It is important to focus on learning the foot patterns and omit arm movements and arm movements could be added later on. Raising arms above shoulder level makes the heart work harder and can result in breathlessness. Intensity of exercise can be lowered by lowering the arms and to decrease breathlessness. (Clarence F. Robinson, 1974).

## **1.7 IMPORTANCE OF PHYSICAL, PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES**

“The goal of physical fitness programme is to improve the performance in activities of daily living, job demands, sports and recreational activities”. (Frank W. Dick, 1992).

“Fitness is composed of many complex factors where complete evaluation cannot be done by testing a single factor. Many variables such as those included in measuring cardio-respiratory balance, flexibility and nutrition reflex each in special way, some aspect of total physical fitness”. (Fox, et.al., 1988).

“For the physiological system of the body to be fit, they must function well enough to support the specific activity in which individual is performing. Moreover, different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurological process which are specific to the activity”. (Reben B. Frost., 2001).

Psychology plays a major role in sports and is closely associated with psychological components.

The physical components which are indispensable for handball players such as speed, abdominal strength, flexibility and cardiovascular endurance were selected for the study.

### **1.7.1 Speed**

Speed is also the ability to execute motor actions, under given conditions in minimum possible time. Speed is an important ingredient in many sports. Speed will

mean maximal speed and thus apply to sports events where the highest possible speed is strived for a single short-lasting effort are in a repeated maximal effort together lasting less than about ten seconds.

### **1.7.2 Abdominal Strength**

The abdominal strength is very much important in sports because the abdominal part become the axis of the body the centre of gravity also will fall mainly in the abdomen. The abdominal strength helps to maintain the body posture there by involving in many activities in the field of sports and games.

### **1.7.3 Flexibility**

“Flexibility is the ability to execute a wide range of movement in the joints while for repetition of work done in natural speed. Flexibility is most important. Flexibility helps to move bodily parts easily, takes less time, energy to perform a task. Elasticity in muscle reduces tension and provides maximum length. Thus, yielding passive physical stretch”. (Hardayal Singh, 1991).

### **1.7.4 Cardiovascular Endurance**

Cardiovascular endurance may be defined as the ability of lungs and heart to taken in a transport adequate amount of oxygen to the working muscles.

“Cardiovascular Endurance is the ability of the heart, blood vessels, blood and respiratory system to supply oxygen and fuel to the muscles at a steady rate for a considerable length of time”. (Strukic P.J., 1981).

Vital capacity and breath holding time were considered as an important physiological variables for handball performance and they were selected for this study.

### **1.7.5 Vital Capacity**

Vital capacity is the maximum amount of air a person can expel from the lungs after first filling the lungs to their maximum extent and then expiring to the maximum extent. It equals the inspiratory reserve volume plus the tidal volume plus the expiratory reserve volume.

### **1.7.6 Breath Holding Time**

Breath holding time is defined as the duration of time through which one can hold one's breath without inhaling and exhaling after a deep inhalation.

“Endurance type of training will improve the breath holding time. Breath holding time also plays a vital role in the sports performance”. (Strukic P.J., 1981).

Achievement motivation, self-confidence and anxiety were considered as an important psychological variables for handball performance and they were selected for this study.

### **1.7.7 Achievement Motivation**

Motivation means move to achieve. In psychology the term motivation or motive refers to activation from within in the organism.

The motivation is termed as the urge to push towards a specific goal. Motivation is a concept invented to describe the psychological state or the organism

as it is affected by various influences. A person is motivated when he desires some goal, a goal that will meet his need or satisfy his interest. Level of achievement motivation is positively related to success.

### **1.7.8 Self-Confidence**

Self-confidence is an attitude which allows individuals to have positive yet realistic views of themselves and their situations. Self-confident people trust their own abilities, have a general sense of control in their lives, and believe that, within reason, they will be able to do what they wish, plan, and expect.

“Self-confidence is not necessarily a general characteristic which pervades all aspects of a person’s life. Typically, individuals will have some areas of their lives where they feel quite confident, e.g., academics, athletics, while at the same time they do not feel at all confident in other areas, e.g., personal appearance, social relationships”. (Marie Reid, et.al. 2000).

### **1.7.9 Anxiety**

While doing any job when one suspects about the proportion of possibility of success is known as anxiety. Anxiety is psychological factor which differs from arousal. It encompasses some degree of activation and an unpleasant emotional state. This form anxiety is used to describe the combination of intensity of behaviour and directional effect or emotion.

Anxiety plays an important role in the acquisition of motor skills as well as in athletic performance. Anxiety can either enhance or inhibit performance whether its effect is positive or negative depends on how an individual athlete perceives the

situation. People with low trait level has been known to perform better in selected motor skills than those with high or trait levels. There is also positive relationship between participants in athletic competition.

## **1.8 REASONS FOR SELECTION OF THE STUDY**

Sportsmen requires a multitude of athletic abilities, such as explosive acceleration and fast sprinting speed; muscular endurance and strength in the lower body; muscular balance and high levels of neuromuscular co-ordination, body awareness and agility, the ability to know where the body is, and be able to move it; good flexibility to avoid injury and correct balance between the quadriceps and hamstrings, as well as strength imbalances between the left and right leg. Thus, every sportsman is interested to improve their physical, physiological and psychological and performance levels.

If one failed to establish correct training patterns for young athletes, unfortunately, goes way back. Hence the investigator was interested to find out the effects of varied capsules of training, namely, circuit training, interval training and stair case training on selected physical variables such as speed, abdominal strength and flexibility and cardiovascular endurance physiological variables vital capacity and breath holding time and psychological variables such as achievement motivation, self-confidence and anxiety and skill variables such as dribbling, shooting and wing shot shooting among college level men handball players.

## **1.9 OBJECTIVES OF THE STUDY**

1. To find out the influence of varied capsules of fitness training namely circuit training, interval training and stair case training for better performance on selected physical variables among college level men handball players.
2. To evaluate the effect of varied capsules of fitness training namely circuit training, interval training and stair case training for better performance on selected physiological variables among college level men handball players.
3. To determine the impact of varied capsules of fitness training namely circuit training, interval training and stair case training for better performance on selected psychological variables among college level men handball players.
4. To find out the effect of varied capsules of fitness training namely circuit training, interval training and stair case training for better performance on selected skill performance variables among college level men handball players.

## **1.10 STATEMENT OF THE PROBLEM**

The purpose of the study was to find out the effect of varied capsules of fitness training namely circuit training, interval training and stair case training on selected physical, physiological, psychological and skill performance variables among college level men handball players.

## **1.11 HYPOTHESES**

1. It was hypothesised that 12 weeks of varied capsules of fitness training namely circuit training, interval training and stair case training would

significantly improve the selected physical variables namely speed, abdominal strength, flexibility and cardiovascular endurance and physiological variables namely vital capacity and breath holding time and psychological variables namely achievement motivation, self-confidence and anxiety and skill performance variables namely dribbling, shooting and wing shot shooting among college level men handball players.

2. It was hypothesised that 12 weeks of circuit training would significantly improve the selected physical variables namely speed, flexibility and cardiovascular endurance and physiological variables namely vital capacity and breath holding time and psychological variables namely achievement motivation and self-confidence than stair case and interval trainings among college level men handball players.
3. It was hypothesised that 12 weeks of stair case training would significantly improve the selected physical variable namely abdominal strength and psychological variable namely anxiety and skill performance variables namely dribbling, shooting and wing shot shooting than circuit and interval trainings among college level men handball players.
4. It was hypothesised that 12 weeks of interval training and stair case training would significantly improve the selected physical variables namely speed, abdominal strength, flexibility and cardiovascular endurance and physiological variables namely vital capacity and breath holding time and psychological variables namely achievement motivation, self-confidence and anxiety and skill performance variables namely dribbling, shooting and wing shot shooting than control group among college level men handball players.

### **1.12 SIGNIFICANCE OF THE PROBLEM**

1. This study is unique in suggesting varied training schedules for the physical, physiological, psychological and skill variables of college men handball players.
2. The findings of this study would suggest which training schedule is better in improving and developing the specific physical, physiological, psychological and skill variables of handball players.
3. The findings would be helpful for the coaches and administrators to modify their existing training schedules for the preparation of handball probable's.
4. This study may help the coaches and physical educators to train the handball players to improve their selected physical, physiological, psychological and skill variables.
5. This research may help the sports scientists to suggest ways and means to improve better standard in sports through suggesting suitable training methods.
6. This study may provide clear guidelines in better performance to be groomed for higher levels of competition.

### **1.13 DELIMITATIONS**

1. The study was delimited to the college men handball players in the age group of 18 to 24 years from various colleges of the University of Madras.

2. The study was delimited to 80 handball players. Further, they were randomly assigned into four equal groups of 20 subjects each.
3. The period of the training programme was delimited to 12 weeks.

The study was restricted to the following variables.

### **Dependent Variables**

#### **Physical Variables**

1. Speed
2. Abdominal Strength
3. Flexibility
4. Cardiovascular Endurance

#### **Physiological variables**

1. Vital Capacity
2. Breath holding time

#### **Psychological Variables**

1. Achievement Motivation
2. Self-Confidence
3. Anxiety

#### **Skill Variables**

5. Dribbling
6. Shooting
7. Wing Shot Shooting

## **Independent Variables**

1. Twelve Weeks of Circuit Training
2. Twelve Weeks of Interval Training
3. Twelve Weeks of Stair Case Training

### **1.14 LIMITATIONS**

1. The influence of certain factors like daily routine, food habits, life style and rest period were not taken into consideration.
2. Hereditary and environmental factors which contribute to both physical and mental efficiency were not taken into consideration.
3. Though the total work load of these three training programme was equated, the intensity of the load which varies from individual to individual was not taken into consideration.
4. The previous knowledge of the subjects and their experience in activities was not taken into consideration.

### **1.15 DEFINITION OF TERMS**

#### **1.15.1 Training**

“Training has been explained as programme of exercise designed to improve the skills and increase the capacities as resting heart rate”. (Hardayal Singh, 1991).

#### **1.15.2 Circuit Training**

“It is the type of training, in which a certain number of exercises are done one after the other in the form of a circuit. This circuit is repeated three or more times.

Circuit training can be used for the improvement of technical and tactical element or for the improvement of conditional activities”. (Hardayal Singh, 1991).

### **1.15.3 Interval Training**

Fox and Mathews (1974) defined interval training as a system of conditioning or training consisting of a series of repeated bouts of exercise alternated with periods of relief, light or mild exercise usually constitutes the relief period.

### **1.15.4 Stair Case Training**

Staircase training is a suitable exercise to burn fat and improve the condition of heart and lungs. Staircase training is a creative, fine and very challenging patterns of movement, that is, on and off stair case can challenge the legs, footsteps and arms also.

### **1.15.5 Speed**

“The capacity of moving a limb or part of the body’s lower system or the whole body with the greatest possible velocity”. (Catherin Soanes, et.al., 2000).

The maximal rate at which an individual is able to move the entire body over a specific distance is considered to be his speed movement.

### **1.15.6 Abdominal Strength**

“Muscular strength is the maximum amount of force that a muscle can exert against some form of resistance in a single effort. The strength exerted by the abdominal muscles is defined as abdominal strength and was measured by sit ups tests”. (Thomas Karik Cureton, 1974).

### **1.15.7 Flexibility**

“Flexibility is the range of motion around a joint. Good flexibility in the joints can help prevent injuries through all stages of life”. (Thomas Karik Cureton, 1974).

### **1.15.8 Cardiovascular Endurance**

The ability to sustain a series of repetitions of an activity without unduly taxing the physiological systems that furnish the fuel and oxygen to the muscles is considered as cardiovascular endurance.

### **1.15.9 Vital Capacity**

The volume of air that can be moved out of the lungs after maximum inspiration is called vital capacity.

The maximal volume of air that can be forcefully exhaled from the lungs following a maximal expiration.

### **1.15.10 Breath Holding Time**

“Breath holding time is the duration of time through which one can hold his breath without the study of all living things”. (Morehouse, Laurence E. et.al., 1976).

### **1.15.11 Achievement Motivation**

“Achievement motivation refers to the tendency to strive to achieve and excel in whatever challenge that is presented and sports achievement motivation is defined as the tendency to strive to achieve and excel in particular game or sport”. (Kamlesh, M. L., 1990)

**1.15.12 Self-Confidence**

“Self-confidence is an attitude which allows individuals to have positive yet realistic views of themselves and their situations”. (Marie Reid, et.al., 2000).

**1.15.13 Anxiety**

“A state of restlessness and agitation, often with general indisposition and a distressing sense of oppression at the epigastria”. (Marie Reid, et.al., 2000).