CHAPTER - I
INTRODUCTION

The word ‘Training’ occupies an indispensable part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. The term ‘Training’ is widely used in sports. There is, however, some disagreement among sports coaches and sports scientists regarding the exact meaning of this word. Some experts, especially belonging to sports medicine, understand sports training as basically doing physical exercises. Several terms used in training, like strength training, interval training, technical and tactical training reflect this line of thinking.

The regular and systematic use of physical exercise, however, does not guarantee the maximum improvement in performance. The effect of these exercises is increased or decreased by a multitude of factors. Some of these factors, if ignored, lead to drastic reduction in the efficiency of physical exercises. Most important among these are sports equipment and implements, verbal instructions, means of recovery, means of assessment of performance capacity, nutrition, and psychological means and so on. In order to achieve best results, all the factors or means are to be used in addition to or along with physical exercises. The physical exercises and the other means or factors are to be judiciously applied in systematic manner. The process of preparation of a
person for improving his performance, therefore, should not be confined only
to physical exercises.

Sports training are done for improving sports performance. The sports
performance, as any other type of human performance, is not the product of
one single system or aspect of human personality. In contrast, it is the product
of the total personality of the sports personality. The personality of a person has
several dimensions like physical, physiological, social and psychic. In order to
improve sports performance, the social and psychic capacities of the sports
person also have to be improved in addition to physical and physiological ones.
In other words the total personality of a sportsman has to be improved in order
to improve his performance. Sports training, therefore, directly and indirectly
aims at improving the personality of the sportsman. No wonder, therefore,
sports training is an educational (i.e., pedagogical) process.

Sports training is a systematic process extending over a long period. For
best results the system of training has to be based and conducted on scientific
lines. Where it is not possible to do that, the training has to be based on the
results of successful practice which has withstood the test of time. Sports
science has still not been able to provide a scientific base for all the aspects and
elements of training. Many things are still based on the results of successful
practice which on deeper analysis is also a method of science to prove or
disprove a theory. Moreover, the principal characteristic of a science is the
existence of a systematized body of knowledge. The science of sports training
has its own systematized body of knowledge and hence is a science in itself. (Hardayal Singh, 1991)

“Sports training is a planned and controlled process in which, for achieving a goal, changes in complex sports motor performance, ability to act and behavior are made through measures of content, methods and organization”. (Martin, 1979) “Sports training is the basic form of preparation of sportsmen”. (Matwejew 1981) “The preparation of sportsman represents a multisided process of purposeful utilization of the total complex of factors (means, methods and conditions) which help in the development of the sportsman and ensure a necessary level of his sports performance ability”. (Matwejew, 1981) “Sports training, based on scientific knowledge, is a pedagogical process of a sports perfection which through systematic effect on psycho-physical performance ability and performance readiness aims at leading the sportsman high and the highest performance. Through active and conscious interaction with the given demands in sports training, the sportsman’s personality develops according to the norms and standards of socialist society”. (Harre, 1986) “Sports training is a scientifically based and pedagogically organized process which through planned and systematic effect on performance ability and performance readiness aims at sports perfection and performance improvement as well as at the contest in sports competition”. (Thiess and Schnable, 1986)
Aerobic exercise means the exercise where all the body parts/muscles are supplied with enough oxygen with the increased heart rate. Aerobic exercise includes brisk walking, jogging, swimming, cross-country, cycling, hopping and skipping. By doing aerobics the whole body is used and major muscle groups including legs, trunk and arms are getting involved. In aerobic exercise the heart rate increases substantially, but never reaches its maximum level. The heart always able to deliver sufficient oxygen-rich blood for muscles so that they can derive energy from the fat glycogen aerobically. Aerobic exercises build stamina for sports and it also is the most important form of exercise for health, since it increases the efficiency of heart, blood circulation and muscles. Aerobic exercise is the key stone of fitness by and it increases the capillary network in the body.

Training increases the overall efficiency of the heart, contraction becomes more forceful, and the diastolic phase increases the reservoir capacities are enlarged. (Book Walter, 1969)

Deficiency of an individual on performing activities depends basically on Cardio respiratory changes and training causes development of cardio respiratory efficiency. Through training, the efficiency of the circulatory and respiratory systems is improved and resting and exercise blood pressure values are lowered. (Mathews and Fox, 1980)

It has been conclusively proved that sports man indulging in strenuous sports will have increased the efficiency of Heart function, Circulation, the
greater oxygen consumption, greater fatigability, increased pulmonary ventilation, better extraction and more appetite than sedentary one. *(Baratatta, 1958)*

Both the terms and the specific exercise method were developed by Kenneth H. Cooper, M.D., an exercise physiologist, and Col. Pauline Potts, a physical therapist, both in the United States Air Force. Dr. Cooper, an avowed exercise enthusiast, was personally and professionally puzzled about why some people with excellent muscular strength were still prone to poor performance at tasks such as long-distance running, swimming, and bicycling. He began measuring systematic human performance using a bicycle ergometer, and began measuring sustained performance in terms of a person's ability to use oxygen. His groundbreaking book, *Aerobics*, was published in 1968, and included scientific exercise programs using running, walking, swimming and bicycling. The book came at a fortuitous historical moment, when increasing weakness and inactivity in the general population was causing a perceived need for increased exercise. It became a bestseller. Cooper's data provided the scientific baseline for almost all modern aerobics programs, most of which are based on oxygen-consumption equivalency.

Aerobic exercise is the exercise that involves or improves oxygen consumption by the body [1]. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. Many types of exercise are aerobic, and by definition are performed at moderate
levels of intensity for extended periods of time. (Wikipedia, the free encyclopedia, 2009)

Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines with the goal of improving all elements of fitness (flexibility, muscular strength, and cardiovascular fitness). It is usually performed to music and may be practiced in a group setting led by an instructor, although it can be done solo and without musical accompaniment. With the goal of preventing illness and promoting physical fitness, practitioners perform various routines comprising a number of different dance-like exercises. Formal aerobics classes are divided into different levels of intensity and complexity. Aerobics classes may allow participants to select their level of participation according to their fitness level. Many gyms offer a wide variety of aerobic classes for participants to take. Each class is designed for a certain level of experience and taught by a certified instructor with a specialty area, related to their particular class.

MECHANISM OF AEROBIC TRAINING

Aerobic Exercises

Aerobic refers to a variety of exercises that stimulate heart and lung activity for a time period sufficiently long to produce beneficial changes in the body.

Aerobic basically means living or working with oxygen. Aerobics or endurance exercises are those in which large muscle groups are in rhythmic repetitive fashion for prolonged periods of time.
The term Aerobics was coined by Kenneth Cooper in the late 1960’s who strongly believed that the reasonably strong firm workout to music could produce beneficial results for a person’s cardiovascular endurance system. As one experiences the state of quickened breathing, the concomitant state of elevated pulse and cardiac output as a result of the exercise, metabolism is raised and the heart – the most important muscle in the human body is given a decent workout.

Aerobic exercise is the most important form of exercise for health since it increases the efficiency of heart rate, blood circulation and muscle strength.

By doing exercise, the whole system of the body carries oxygen rich air which enters through the organs and tissues of the muscles which is called “the aerobic system” and for this reason, training the system for stamina is called aerobic training.

A typical aerobic exercise work out consists of 8 to 10 minutes of stretching, calisthenics and low intensity exercise. This is followed by 15 to 45 minutes of their high or low impact aerobic dancing according to the target training intensity. The 10 minutes cool down period usually includes more stretching and callisthenic type exercise. (Hayward, 1989)

Aerobic is a good way to decrease the percentages of body fat and attain other metabolics of fitness. It develops muscular skeletal fitness while building strength, flexibility and coordination.

There is normally an increase in the number of red blood cells, but not in the concentration of hemoglobin in the blood. Practicing aerobic exercises
results in the productivity of less lactic acid and greater endurance. Physiologists have found that it reduces blood pressure and changes blood chemistry, and also improves the efficiency of the heart.

Thus, the aerobic dance programme contributes to physical fitness by providing aerobic exercise and improving Cardio respiratory endurance and muscular endurance.

Millions of people who eagerly enrolled in aerobics, swimming and jogging regularly and participate in a multitude of other activities such as already determined and that these activities are not only fun but they contribute to their physical, motor abilities, physiological and social development.

Dr. Kenneth Cooper & Jackie Sorensen New York first started the Dance Aerobics in 1971. Being a well known cardiologist, Dr. Cooper knew the importance of cardio respiratory fitness to its fullest. Later Sorensen added the music component to it when their show went on to television.

In 1978, Jane Fonda entered the most popular name in Dance Aerobics. She gave this form of exercise that receives the tremendous popularity it enjoys today. She introduced the high impact element to Dance Aerobics Higher Calorie burning of high impact dance aerobics made this very popular. But later higher risk of injuries involved in it made the researchers look into other form of dance aerobics, which had higher calorie burning as well as lower rise of injuries. In this, the intensity was increased by adding lots of hand but the impact was kept low.
In 1986, one of the innovative aerobics instructors in Atlanta, USA, started playing with the idea of going up and down the steps for cardio respiratory fitness (CRF) and making it interesting with the help of music and different formations. She successfully gave her idea a practical and effective form and introduced the Bench / Step workouts. Step workouts are high calorie burners and have lower rise of injuries if done properly. This form of aerobics today is the most popular of all, over the world.

The term ‘Aerobics’, or ‘aerobic exercise’, was coined in the early 1960’s by Dr. Kenneth Cooper. His research showed that sustained cardiovascular exercise is a valid form of preventive medicine for maintaining general fitness. Cooper determined the cardiovascular and respiratory benefits yielded by different types of exercises. He then determined the minimum amount of “benefits points” one needs regularly to maintain health and improve fitness.

According to Cooper’s research, one can get these points with any type of cardiovascular exercise that it is a valid form of preventive medicine for maintaining general fitness. Cooper determined the cardiovascular and respiratory benefits yielded by different types of exercises.

He chose the word ‘aerobic’ meaning with oxygen, to represent this idea. Even so, the dynamics of the idea are more complicated than implied by the definition. Aerobics can be viewed as an intricate system of bodily supply and demand. That is, the body needs energy for any type of activity, and the
need is filled by burning off the food we eat. Oxygen is the spark the fuel needs to burn.

Regardless, aerobics is the word in general use. The fact is that Cooper codified and organized what fitness means to many, many people. He is generally credited with being one of the main forces of the current fitness craze. The majority medical opinion is that aerobic programs strengthen heart muscle, increase the efficiency of lungs and offer other wonderful benefits.

Aerobic activity or cardiovascular fitness is probably one of the hottest terms today. Where did the popularity of the term come from? Much of the credit goes to Dr. Kenneth H. Cooper, following many years of research, using thousands of United Air Forces personnel. Today studies are being done at the Aerobics Centre in Dallas, Texas.

It includes common everyday activities such as walking, running, swimming, cycling and rope skipping. What is new is the point system that has been developed as a result of Cooper’s research. This system allows the person to measure different activities in terms of energy expenditure and, in this way, to determine what kind of activities are best and how along a person must participate in an activity to receive the most beneficial results. Basically, what is measured is “intensity”. For eg., how two men running ten miles a day, can one be in aerobic shape while the other is not? Because man A has run ten miles in fifty minutes while man B has run ten miles in three hours.
Basically, aerobic or cardiovascular activity is the ability to maintain a moving, large muscle activity (like cycling, rope jumping, running) for a period of time (ten minutes or more) without having oxygen debt (an oxygen debt causes dizziness lightheadedness or fainting). There are number of methods for developing cardiovascular fitness. The first one presented was designed by Dr. Cooper. His program is based on a point system. Activities that are more strenuous than others are given a higher point value. Dr. Cooper’s findings indicated that the most beneficial activities are swimming, cycling, brisk walk, stationary running, rope skipping and running.

Basketball is the fast-paced game played on a rectangular court, generally indoors, by two five-players teams. The primary objective of the game is to score more points than the opposition by putting a round ball through a circular band, called a rim. The two rims at each end of the court, placed 10 ft (3.1 m) above the ground and connected to a backboard, a rectangular board hands from the ceiling or is supported in the air on a pole or some other structure. One of the most popular sports in the world, basketball is played by men and women of all ages and ability levels in more than 200 countries.

MECHANISM OF SKILL TRAINING

The complex nature of sports training involving physical exercise along with other means becomes obvious when one looks at the training of the advanced sports persons. The training of advanced sports persons is significantly supported by means and measures from several sports science
disciplines like sports medicine, sports physiology, nutrition, physiology, nutrition, physiotherapy, sports psychology, sports biomechanics and so on. It can be stated as a principle that higher the level of sports performance more is the involvement of sports science disciplines. It, however, does not mean that the role of coach becomes less but that the help taken by the coach from the sports scientists increases. The planning, implementation and control of training is still the sole responsibility of the coach.

Now, it is quite obvious that various endeavours have been made at different levels to advance acceptable definition of the vital process of sports training. After considering the nature of sports training as viewed by some eminent authorities on this subject, the following definition of sports training is proposed.

Sports training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performances in sports competitions.

**TRAINING**

Training is a program of exercise designed to improve the skills and increase the energy capacities of an athlete for a particular event (Fox, 1984).

**MEANING OF TRAINING**

The word “Training” is used in its broad sense and its meaning varies with field of application. In sports, the word ‘training’ is generally understood to be synonym of doing physical exercises for the improvement of performance.
“Training is a systematic process of repetitive and progressive exercise or work involving also learning process and acclimatization”. (Arnheim, 1985)

Training improves the functioning of the circulatory and respiratory and the muscle system, while practice is largely aimed at improving the control of muscular activity by the nervous system.

Sports training is characterized by a continuous control and regulation. Systematic nature of the training process is reflected adequately by the fact that the various means and methods, load dynamics, training tasks etc., are all planned in order to achieve short and long term goals, keeping in view the interrelations of various training elements, cyclic nature of performance developments and long term goal of sports training.

The determination of performance structure is a very difficult task and till now sports scientists and coaches have not able to tackle this task. A systematic and integrated effort by various training scientists in class co-operation with the coaches is needed for effectively meeting this challenge. A beginning has been made in this direction and after some years perhaps, we would be in a position to determine satisfactory the structure of performance in various sports. This would decidedly have a positive effort on better and systematic formulation of the process. (Singh, 1984)

The basis behind the overload principle is that for training adaptations to occur, the muscle or physiological component being trained must be exercised at a level that it is not normally accustomed to. For instance, to maximize
muscular strength gains, the muscle need to be stimulated with a resistance of relatively high intensity. If an exercise prescription calls for an individual to perform five repetition maximum (RM), and that person uses a resistance that can be lifted for more than five repetitions, then that individual may not be overloading the muscle. Subsequently, strength gains may not be maximized.

Another example is the endurance athlete who trains for a marathon. If the training goal of the individual is to maximize aerobic capacity in order to run a faster time, then training intensity must be near or at the individual’s anaerobic threshold. This can be expressed as a percentage of the individual’s maximal heart rate. If the training intensity is not high enough (e.g., heart rate does not reach the required range), then the desired physiological adaptations that can result in an improved aerobic capacity will not be attained.

According to specificity principle, adaptations are specific to the muscle trained, the intensity of the exercise performed the metabolic demands of the exercise, and the joint angle trained. For instance, if the goals of the training program is to maximize strength gains, then performing low-intensity, high volume exercise would not be specific to the objectives of the particular program. Likewise, one would not prepare for a marathon by concentrating solely on running short sprints. Resistance training is often a part of an athlete conditioning program with a primary objective to improve sports performance. The training program must have a high carryover to the sport. Except for actual practice of the sport, no conditioning program has cent per cent carry over.
Success in competitive sports and games can be attributed to many factors, training being one of the major factors. Different training methods have been commonly used to improve physical fitness and its related standards of performance of athletes. The training methods include, Interval training, Fartlek training, Circuit training, Weight training, Altitude training Resistance training, Hypoxic training, Continuous training, Alternate pace training etc.

Sports training is an exercise repeated at frequent intervals for the purpose of improving strength and endurance. Practice differs from training by its goal of improving the performance of a particular act rather physical activity in general. Training improves the functioning of the circulatory, the respiratory and the muscle system, while practice is largely aimed at improving the control of muscle activity by the nervous system (More house and Miller, 1976).

Physical training brings local changes in the muscles, improved neuro muscular cooperation activities and series of more general cardio respiratory changes as mentioned below:

1) An increase of maximum respiratory minute volume in exercise.

2) Possibly a slight increase in oxygen diffusing capacity.

3) 10-30 percent increase of maximum oxygen uptake (depending on initial fitness.

4) An increase in stroke volume and maximum cardiac output.

5) An increase in size of heart, and

6) An increase in total haemoglobin and blood volume (Anderson, 1971)
BIO-MOTOR RESPONSE TO PHYSICAL ACTIVITY

Functioning of the body requires energy which depends upon the ability of the heat and blood vessels to process oxygen and deliver it to the muscle, where it becomes fuel for energy. (Hokey, 1985)

Regular exercise results in an increase in the blood, improved oxygen carrying and waste removal capacity and increase in workload capacity. (Vitale, 1973)

c) MAXIMUM OXYGEN CONSUMPTION

Maximum oxygen consumption is defined as the greatest oxygen uptake attained by an individual while breathing air sea level during the performance of physical work. (Larry, 1982)

Basketball is unusual in that it was invented by one man, rather than evolving from a different sports. In 1891, Dr James Naismith, a Canadian minister from the faculty of a college for YMCA professionals in Springfield, Massachusetts, sought a vigorous indoor game to keep young men occupied during the long New England winters. Legend has it that, after rejecting other ideas as either too rough or poorly suited to walled-in gymnasiums, he wrote the basic rules, and nailed a peach basket into the gym wall. The first official game was played in YMCA gymnasium on January 20, 1892. “Basketball”, the name suggested by one of his students, was popular from the beginning, and with its early adherents being dispatched to YMCA throughout the United States, the game was soon played all over the country.
Interestingly, while the YMCA was responsible for its initial development and spreading the game, within a decade, the new sport was discouraged as a tough play and over crowds began to detract from YMCA’s primary mission. Other amateur sports clubs, colleges, and professional clubs quickly filled the void. In the years before World War I, the Amateur Athletic Union and the Intercollegiate Athletic Association (forerunner of the NCAA) vied for control over the rules of the game.

Basketball was originally played with a soccer ball. The first balls made specially for basketball were brown, and it was only in the late 1950s that Tony Hinkle, searching for a ball that would be more visible to players and spectators alike, introduced the orange ball which is now common in use.

Naismith himself was instrumental in establishing the college game, coaching at University of Kansas for six years before handling the reins to renowned coach Phog Allen. Naismith’s disciple Amos Alonso Stagg brought basketball to the University of Chicago, while Adolph Rupp, a student of Naismith at Kansas, enjoyed great success as a coach at the University of Kentucky. College leagues date back to the 1920s, and the first national championship tournament, the National Invitation Tournament (NIT) in New York, followed in 1938. College basketball was rocked by gambling scandals from 1948-1951, when dozens of players from top teams were implicated in game fixing and point-saving. Partially spurred by the association of the NIT with many of the cheaters, the NCAA national tournament surpassed the NIT
in importance. Today, the NCAA tournament is rivaled only by the baseball World Series and the Super Bowl of American Football in the American sports psyche.

In 1920s, there were hundreds of professional basketball clubs in towns and cities all over the United States. There was a little organization to the professional game, as players jumped from team to team, and teams played in armories and smoky dance halls. Leagues came and went and barnstorming squads such as the New York Rens and the Original Celtics played up to two hundred games a year on their national tours.

Robertson and Jerry West; more recent big men Kareem Abdul-Jabbar and Bill Walton, playmaker John Stockton; and the three players who many credit with ushering the professional game to its highest level of popularity; Larry Bird, Magic Johnson, and Michael Jordan.

The NBA-backed Women’s National Basketball Association began to play in 1997. As in the NBA, several marquee players (Sheryl Swoops, Lisa Leslie, and Sue Bird among others) have helped the league to improve its popularity and the level of competition. Other professional women’s basketball leagues in the United States have folded because of the success of WNBA.

FIBA dropped the distinction between amateur and professional players in 1989, and in 1992, professional players played for the first time in the Olympic Games. The United State’s dominance briefly resurfaced with the
introduction of their Dream Team. However, with developing programs elsewhere, other national teams have now caught up with the United States. A team made entirely of NBA players finished the sixth in 2002 World Championships in Indianapolis, behind Serbia, Montenegro, Argentina, Germany, New Zealand and Spain. In the 2004 Olympics, the United States’ Dream Team lost their first game in history to the Puerto Rican National Basketball Team and eventually came in third after Argentina and Italy.

Women’s basketball was added to the Olympics in 1976, with the teams such as Brazil and Australia rivaling the American squads.

In worldwide, basketball tournaments are held for all age levels, from five-to-six-year-old (called biddy-biddy), to high school, college, and professional leagues. Tournaments are held at each level for both boys and girls.

**Position**

During the first five decades of basketball’s evolution, a player’s occupation one of three positions, as flows: two guards, two forwards, and one center. Since the 1980s, more specific positions have evolved, as follows:

1. Point guard
2. Shooting guard
3. Small forward
4. Power forward
5. Center
On some occasions, teams will choose to use a guard offense, replacing one of the forwards or the centre with a third guard.

**Shooting**

The most common and recommended way of shooting the ball is outlined:

The ball is first held with both hands on the side of the ball and the shooting hand under the ball. The ball rests in the shooting hand, in the manner of a waiter carrying a tray. The power of the shot comes from the legs, passing through the elbow and wrist extensions of the shooting arm, finally continuing through the fingers. The ball is short toward the target by extending the wrist in a half-arc until the fingers are pointing toward the floor. The ball rolls off the fingertips while the wrist completes a full downward flex motion. The shooting elbow is extended upward, starting its extension from approximately 90 degree flex. The ball should be evenly placed between the index and middle fingers. Upon the wrist and finger actions, the ball ideally has a reverse, even spins, called backspin. This deadens the shot, upon impact with the rim and applied “touch” the ball.

The ideal trajectory of the shot is somewhat arguable, but generally coaches will profess proper arch. The ball should pass well above the hoop, depending on the length of the shot, and travel downward into the basket to create the best angle for success. A shot that has little arch is called an “arrow” and has less chance of going in. A shot with too much arch is sometimes called “rainbow” is preferable to an “arrow”.

Passing

A ‘pass’ is a method of moving the ball between players. Most passes are accompanied by a step forward to increase power and are followed through with the hands to ensure accuracy.

One of the most basic passes is the ‘chest pass’. The ball is passed directly from the passer’s chest. This has the advantage that it takes the least time to complete, as the passer tries to pass as directly straight as possible.

Another pass is ‘bounce pass’. In this pass, the ball bounces about two-thirds of the way from the passer. Like the chest pass, it is passed from the passer’s chest to the receiver’s chest and it is passed as directly as possible, for example, there should be no downward motion of the ball between the bounce and the time the receiver catches it. In this way, it is completed in the smallest amount of time possible for this pass. It does take longer to complete than the chest pass, but it is more difficult for the opposing team to intercept (kicking the ball deliberately is a violation). Thus, in crowded moments, or to pass the ball around a defender.

The ‘overhead pass’ is used to pass the ball over a defender. The ball is passed from behind the passer’s head, coming over it and aiming for around the chin of the receiver.

Dribbling

‘Dribbling’ is the act of bouncing the ball continuously. When a player is dribbling, he pushes the ball down towards the ground, rather than patting it, because this ensures greater control.
STATEMENT OF THE PROBLEM

The literature in the area of testing impact of aerobic training is not sufficient in Indian context. Hence, it was felt that scientific investigation in this area is of great importance to the physical education and coaches to reinforce their view and conviction in imparting training to the subjects. Hence an attempt was made to investigate the influence of Aerobic training, skill training, and combined aerobic and skill training on speed, agility, cardio respiratory endurance, resting pulse rate, respiratory rate and skill performance (shooting, passing and dribbling).

OBJECTIVES OF THE STUDY

The overall objective of the study is to construct the effective training programmes for the sports persons. The specific objectives of the study are:

1) To prepare training schedule for specific events on the basis of fitness and physiological capacity of the players.

2) To find out the extent to which the Aerobic training, skill training and combined aerobic and skill training would influence beneficially the different dependent variables like Bio-motor, physiological and skill performance.

3) To identify the limitations in imparting these training to sports persons.

HYPOTHESIS

The following hypotheses were drawn in connection with the training influence of Aerobic training, skill training, and combined aerobic and skill training programmes.
It was hypothesized that

1. There is no significant influence of Aerobic training on Bio-motor, Physiological and skill performance among Basketball players.

2. There is no significant influence of skill training on Bio-motor, Physiological and skill performance among Basketball players.

3. There is no significant influence of combined aerobic and skill training on Bio-motor, Physiological and skill performance among Basketball players.

4. There is no significant difference between aerobic training, skill training and combined aerobic and skill training groups on Bio-motor, Physiological and skill performance among Basketball players.

LIMITATIONS

1. No efforts were put into find out the differences in environmental conditions during tests; however dry weather prevailed during the tests.

2. No attempts were made to differentiate motivational level between groups during testing and training.

3. All the subjects were fully residential students and their diet were similar and routine one. No efforts were made either to control or assess the quality and quantum of the food digested, their life style. Psychological stresses and other factors that may affect metabolic system, as this was recognized as a limitation.
4. Astrand – Astrand nomogramic method was indirectly used to assess the Aerobic power.

5. Participation in the intramural and recreational activities by the subjects were not controlled.

DELIMITATIONS

1. For the purpose of this study, only 60 Basketball players were selected from the colleges affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu, India.

2. The subjects were assigned at random to one of the groups (n= 15) in which Group I acted as control, Group II underwent Aerobic training, Group III underwent skill training, Group IV underwent combined Aerobic and skill training.

3. The training period for both the groups were 12 weeks.

4. The age of the subjects ranged from 18-23 years.

5. The criterion variables tested were speed, agility, cardio respiratory endurance, resting pulse rate, respiratory rate and skill performance (shooting, passing and dribbling).

6. Speed was measured by 50 meter run test agility was assessed by 4 × 10 meters shuttle run test, cardio respiratory endurance was assessed by Cooper’s 12 minute run / walk, manual method was followed for resting pulse rate and skill performance (shooting, passing and dribbling) was assessed by AAPERED basketball test.
7. The training schedule was prepared after conducting a pilot study for Aerobic group, skill group and combined group separately and the load was increased slowly by considering the player’s age and capacity.

SIGNIFICANCE OF THE STUDY

A major objective for Physical Educators and Coaches is to construct the most effective training programmes for sports persons. Fitness and health professionals are interested in the development of lifetime exercise patterns among young and adults in our society. This concept relating to the development of fitness for health will help the coaches and physical educators to develop the physiological fitness potential for students and athletes. Through the findings of the study, physical education teachers and coaches would come to know the importance of Aerobic training, skill training and combined Aerobic and skill training in various games.

DEFINITION OF TERMS

SPEED

“The capacity of an individual to perform successive movements of the same pattern at a fast rate”. (Barrow and Gee, 1979)

AGILITY

Agility is defined as the ability of the body or parts of body to change directions rapidly and accurately. (Barrow and Gee, 1979)
ENDURANCE

Muscular endurance is the ability of a muscle group to apply force repeatedly or to sustain concentration for a period of time. (Hockey 1989)

RESTING HEART RATE

The heart rate or heart frequency is defined as the frequency of heart beats in one minute when a player is in resting condition. (Barry, 1982)

CARDIORESPIRATORY ENDURANCE

Cardio respiratory endurance is the ability of the lungs and heart to take in and transport adequate amounts to oxygen to working muscles which allows activities involving large muscle groups to be sustained for long period. (Fox, 1993)

Aerobic exercise is physical exercise that intends to improve the oxygen system Aerobic means “with oxygen”, and refers to the use of oxygen in the body’s metabolic or energy-generating process.

Brisk physical activity that requires the heart and lungs to work harder to meet the body's increased oxygen demand. Aerobic exercise promotes the circulation of oxygen through the blood

The teaching of specific verbal and nonverbal behaviors and the practicing of these behaviors by the patient.

Proficiency, facility, or dexterity that is acquired or developed through training or experience.
**SHOOTING**

Split your team into four groups. Put one group at each basket. Each group will have two balls. Each player will shoot and get his own rebound and pass to the next shooter. At all other baskets available put 2 balls, one on each elbow. Each player must make three shots (or a number you designate) before he can advance. When he makes his shots, he moves clockwise to the next hoop. The object is to see which team completes the circuit of every basket first.

**PASSING**

Passing technique starts with touch and wrist movement as well as arm position. Most passes involve a flick of the wrist with little arm movement. Faking is an important part of effective passing.

**Dribbling**

In sports, dribbling refers to the maneuvering of a ball around a defender through short skillful taps or kicks with either the legs (football/soccer), hands (basketball), stick (bandy) or swimming strokes (water polo). The purpose of such an action is to bring the ball past a defender legally and to create opportunities to score.