CHAPTER-1

INTRODUCTION

In the modern world due to the growing awareness on sports large number of young men and women participate in all over the world. When, in 1891, Dr. James Naismith, a lecturer in an American college, devised a game that would keep his students fit during the winter months, he surely could have had no idea what he was starting. Today, the game of basketball is played all over the world – by boys, girls, men and women – at many different levels (Chris Bunnet and Sean McSweeney, 1991).

The standard of games and sports has improved a lot due to the modern training. The physique of athletes should be carefully studied and activities should be accordingly chosen. Basketball is one of the most popular sports in the world. Success in basketball depends upon an athlete’s speed, power, strength, agility, endurance, skill, flexibility and tactical knowledge. Basketball apart from being a highly skilled game, the rules governing this game has been frequently changed in order to make the game much faster than ever.

Federation of international basketball association (FIBA), the governing body of the game basketball in its amendments during the year 2000 in-order to advance the ball from back court to the front court and to speed up the game it reduces the 10 seconds rule to 8 seconds and similarly the shot clock rule from 30
second rule to 24 seconds. The rules of the game had been improvised continuously. The most important among the changes came during the year 2000. The game has been made to play in 4 ten-minute quarters. In this new format two time outs shall be taken at any time during the first two quarters and three time outs shall be taken at any time during the last two quarters, one time out for each extra period is also permitted, a brief interval of fifteen minutes at the end of second quarter and two minutes interval in between the first two quarter and between the third and fourth quarter is also given. These rule changes have brought in tremendous changes in the mode of playing and training methods.

Being an international basketball referee the investigator has good exposure to witness various levels of the game. It has the greatest advantage to observe the overall game keenly as well as the individual talents. Besides being a basketball player at various levels and has coached at various levels the investigator has realized that the recent changes in the rules of the game need a re-look at the basketball training methods. The latest changes in the rules made the game much speedier and powerful and squeezes the players and taps the aerobic and anaerobic pathways most effectively than ever and than any other game. A player on court sprints for a minimum of six seconds continuously and runs back in almost equal speed for a period of at least three minutes, they also get an equal amount of the recovery period because each team has been provided with sufficient time outs.
So the latest changes made the game much faster, hence a player requires more of anaerobic power than that of aerobic power since the game is full of short sprints.

When a player begins exercising, all three energy systems (i.e., the ATP-PC, glycolysis, and aerobic systems) are involved. However, the relative contribution of each energy source varies according to the demands of the exercise, which in turn vary as functions of the intensity and duration of the activity (Anaerobic/ATP-PC energy system works when the intensity of the activity will range from 0 to 10 seconds; Anaerobic Glycolysis energy system works when the intensity of the activity will range from 10 seconds – 3 minutes and Aerobic energy system works when the intensity of the activity will range from more than 3 minutes). Basketball is about 20% aerobic and 80% anaerobic; many factors, however, influence the exact energy expenditure ratio for individual players. For example, some players continually move to “get open,” whereas others “fight” for a post-up position; some players inbound the ball, whereas others sprint the floor. Moreover, if we examine the total energy demands for an entire 2-hour game, we find the percent contribution of the energy systems changes continually. Assigning exact ratios that would be specific to all styles of play would be impossible. It is widely accepted that basketball is a game requiring a high-level of anaerobic fitness (Brittenham 1996).
The investigator strongly felt that a systematic training based on the recent rule changes will benefit the basketball players. So the researcher intended to study the effect of selected physical, physiological and skill performance variables of the male basketball players who had participated in the inter collegiate level basketball tournaments after training them with specific pre-season training package. The investigator with the help of the experienced coaches designed a different training schedule than the conventional one and tested for significance among the criterion measures and found successful.

1.1 CHARACTERISTICS OF THE GAME

Basketball player needs to develop a wide variety of physical attributes. As the game is full of short sprints and explosive activity such as jumping high and quickly for rebound collection and throwing the ball on the target at regular intervals, to make quick passes, power dribble penetration for which a player need to be trained with a specific training package.

In Basketball, the better a player can dribble, shoot and pass the better his or her chance of success. But those sport-specific skills are minimized if the player is in poor physical condition (Brittenham 1996).

Basketball specific training involves very high intensity exercise lasting from six to ten seconds. This is expected to improve the physiological factors and
explosive power of a basketball player considerably. The effectiveness of exercise depends on the demand on organs and body systems. Moderations of intensity, duration and frequency are taken into consideration prior to the exercise (Gale, 2005).

Speed, agility, explosive power, strength and flexibility were the five major physical fitness variables taken as the criterion measures. These are the most important motor components that influence the performance of a basketball player. Refining basketball skills will only get a player so far unless the player also develop the physical base for performing those skills repeatedly, against physical opponents, throughout the course of a game and season. Thousands of high school and college players can shoot and dribble as well as pros; however, they typically fall short of the pros in conditioning or athleticism. By that I mean they lack the speed, power, agility, coordination, strength and endurance needed to compete against players on a higher level (Brittenham 1996).

1.2 PHYSICAL FITNESS

Many coaches and players equate athleticism with physical fitness. Being physically fit is not only essential from a health standpoint, but the components of fitness such as Cardio-respiratory fitness, muscular strength,
muscular endurance, flexibility and body composition are equally important for the serious basketball players.

For an athlete, however, maintaining a physical capacity beyond the basic standard for health and wellness is critical to insure a high level of performance for an extended period of time. While fitness is an indicator of overall health, it is athleticism that determines the level at which sport-specific skills are performed, and athleticism is an indispensable trait among the future stars of the NBA (Brittenham 1996).

1.2.1 Speed

Speed is an ability to perform rapidly successive movements over a short period of time in a single direction. One needs speed in basketball to make hard drives to beat the defense. Basketball players need quickness or quick reflexes, which will help for steals and snatch rebounds. Speed not only enables the player to move from one end of the court to another much more quickly, the players will be able to transfer much or all of that energy into other basketball-specific movements. The three keys to improving stride length are increase muscular power, improve flexibility in the body joins involved in the movement and improve the mechanics of the movement (Brittenham, 1996)
Speed is a performance determining factor for almost all athletic events. It can be developed only if there is a maximum plasticity of the cerebral cortex, which happens during childhood and youth. Primarily the development of speed will be through an increase in stride rate and length (Arbeit, 1998).

Basketball, on the other hand, requires short and intense periods of activity, so players expend a great deal of energy at a rapid rate. Anaerobic pathways are another aspect of cardio-respiratory fitness, and provide energy for high-intensity activities, thus the anaerobic energy system must also be well developed (Brittenham 1996).

1.2.2 Agility

Agility is the ability to change the direction of the body in an efficient and effective manner. To achieve agility, one requires a combination of several athletic traits including reaction time, speed of movement, strength, balance and coordination. Agility is both general and specific. It is demonstrated in such a movement as dodging, zigzag running and changing body position quickly. Sheppard and Young (2006) proposed a new definition of agility “A rapid whole body movement with change of velocity or direction in response to a stimulus”. Integrating the basketball agility drills with the speed training programs can have a dramatic impact on the game. Basketball agility drills will improve speed around
the court, quickness, co-ordination and most importantly the player’s ability to change direction with minimal deceleration. Basketball players need agility on fast breaks, on defense, to penetrate to the basket during an aggressive defense, or to catch up an opponent or in any act of playing this game. So the most important ability of a basketball player should be the ability to switch rapidly between forward, backward, lateral and vertical movements. Minimizing the amount of declaration is a key factor improving agility. The ability to change direction rapidly explains to a larger degree why high jumpers can leap so high. The high jumper establishes his or her speed during the approach and then transfers this horizontal speed to vertical lift in the last two quick steps prior to the take-off. These same characteristics can be incorporated into movements on the basketball court (Brittenham, 1996).

1.2.3 Explosive Power

Explosive power is a vital ingredient in this game. Coaches are constantly in search of ways to improve power, most specifically the ability to jump higher, run faster, to be agile, to make continuous passes at various lengths and speeds and ultimately to make attempts at the basket continuously from varied lengths and speed on the court. Power should be acquired to achieve maximum gains in developing other game specific skills.
The game of basketball requires repeated bouts of high intensity jumps and sprints. Explosive movements like these are performed by fast twitch muscle fibers. Meanwhile most of the power supply is coming from the anaerobic energy system. The best way to develop these areas is a multiple set approach using moderate to heavy resistance. Muscular power is a combination of maximal strength and speed of movement. To increase speed of movement without reducing the resistance one needs to increase excessive power. Because there are different phases of basketball strength training, depending on the season, one can first build their maximal strength then convert some of that strength into explosive power. There are jump training techniques called plyometrics, which are great for basketball players. They combine speed and strength in single movement pattern.

In basketball, the vertical jump is an integral part of the game itself. The players with superior jumping ability are very successful in the pass and the shoot. For this reason basketball coach would like to determine the best method to increase the height of a player’s jump (Atkins, 2004).

A powerful athlete is able to incorporate maximum force with speed of movement. Explosive power is also called dynamic or functional strength and should be the goal of any resistance training program. Plyometric training is an extremely effective way of combining speed with strength, resulting in dynamic strength (power). Jumping, hopping, skipping, bounding, medicine ball chest passes, and abdominal twist tosses are just a
few of the hundreds of plyometric exercises that can enhance the speed component of power (Brittenham 1996).

1.2.4 Muscular Strength and Endurance

Muscular Strength and Endurance are the ability of a muscle group to contract over an extended time against moderate resistance. Muscular endurance is determined by how well slow twitch muscle fibers are developed. Slow twitch muscle fibres can sustain an effort over a much greater period of time. Muscular endurance is very important for sports and who have to sustain an activity for a long period of time like basketball. The ability of a muscle is to repeat identical movements or pressure or to maintain a certain degree of tension over a period of time (Nelson et.al. 1982).

If one can perform repeated, high-intensity movements without getting fatigued then his muscular endurance is high. For basketball, the act of sprinting up and down the court over and again will become easier, once the players improve their muscular endurance. Jumping several times in a row with minimal loss of power is another result of training for muscular endurance. Muscular endurance is the opposite of muscular fatigue.

The modern game of basketball requires strength — the ability to generate and exert maximal force. Today's player must be ready for contact. Successful players are sufficiently muscled to drive strong to the hoop, get shots off after
being fouled, post up, “fight” through and set picks, and establish rebounding position. Adequate strength also helps in the prevention of injuries and is a very important fitness component.

Muscular endurance is the ability of a muscle or group of muscles to contract and exert force repeatedly over an extended period of time. Players who “lose their legs” at the end of the game are probably suffering from inadequate muscular endurance (Brittenham 1996).

1.2.5 Flexibility

Flexibility refers the range of movement of a joint of a player. It plays an important role in the preparation of athletes by developing range of movements to allow technical development and assisting in the prevention of injury (Harre et.al, 1982).

No matter what conditioning regimen one uses, be sure to utilize these basketball stretch exercises to loosen muscles and prevent injury. Stretching is very important for an athlete to be successful; the muscles must be able to go through a wide range of motions.

Any good stretching program will improve the range of motion of the joint, players should definitely stretch their major muscles such as quadriceps, hamstring, gastrocnemius, deltid etc., and it is equally importance to stretch the
other muscles also. A committed basketball player should stretch a minimum of 10 to 15 minutes per session, two or three times per day, 7 days per week. One should stretch to the point of moderate tension and hold for a minimum of 10 seconds then relax for 3 to 5 seconds and repeat. Spend additional time on muscles that are chronically tight. One should perform two or three sets per stretching exercise (Brittenham, 1996)

1.3 PHYSIOLOGICAL VARIABLES

Physiology is the study on how exercise alters the structure and function of specific physiological systems of the body to be fit; they must function well enough to support the particular game. The demand upon the organism is different for various games with respect to neurological, respiratory, circulatory and temperature regulating functions. The physiological fitness is specific to the activity.

Physiological systems are highly adaptable to exercise. The response of each system is discrete. Each task has its major physiological components and fitness for the task requires effective functioning of appropriate systems. Knowledge about the human organism and how it develops, adjusts, adopts and modifies due to various stresses is of paramount importance in the activity.

Aerobic training can be done through any activity requiring continuous use of large muscle groups (e.g., walking, running, jogging,
swimming, bicycling, cross-country skiing, rowing, etc.) for 20 to 60 minutes, 3 to 5 days per week, at a moderate intensity. Such a training program will improve or maintain your cardio-respiratory fitness. An effectively trained cardio-respiratory system is capable of sustaining low-intensity effort for a long time because it's capable of consuming vast amounts of oxygen, transporting the oxygen, and aerobically utilizing the oxygen as an energy source for an extended period (Brittenham 1996).

1.3.1 Maximal Oxygen Consumption (VO₂ Max)

As basketball game consists full of high intensity workouts it was presumed that high intensity of anaerobic exercises will also develop physiological factors to a greater extent. Hence VO₂ max an important physiological factor was also taken as a criterion measure for this study. The most basic physiological indicators of a player's fitness and running performance is VO₂ max. VO₂ max or maximal oxygen uptake is a measure of how much oxygen the body can process to produce energy. It is measured in milliliters of oxygen per kilogram of body weight per minute – ml/kg/min. When a player increases his running speed his body demands more and more energy to keep him on pace. To produce all of that energy the body uses up a lot of oxygen. Maximal oxygen consumption (VO₂ max) is the maximum capacity to transport and utilize oxygen during incremental exercise (Bouchard et.al 1999).
1.4 SKILL PERFORMANCE

Apart from the physical and physiological criterion measures, skills play an increasingly vital role in the quest for victory of any game. There are a number of skills involved in the game of basketball like passing, dribbling, shooting, rebounding, half court press defense, full court press defense, zone defense, screening, weaving, drive-in etc. In this study, some of the basic and important skill performance variables were also taken up for the study.

A good basketball team must have every player on the court, should perform the skills perfectly, so that the team can benefit. Of course, players will not be able to do these skills, unless they practice themselves. That’s why it’s so important for players to practice these basic skills throughout their playing career. There are lots of drills, which will enable the players to learn the advance levels of these basic skills.

Basketball is unique among sports in that there are fewer specialists or one-dimensional athletes in the game. Each player must be a total player. Football has field goal kickers, baseball has designated hitters, and soccer and hockey have goalies. But basketball players, although they may excel in certain areas of the game (for example, three-point shooting, rebounding, defense), must have a wide array of skills. Multiple skills are essential to play the game effectively.
Every basketball player should be able to

- Pass and receive the basketball,
- Make the transition from offense to defense and from defense to offense,
- Rebound offensively and defensively in relation to their position (a point guard, for instance, is not expected to rebound as much as a post player),
- Play good defense, and
- Blend in with the other four players.

But a coach should not expect each player to have equal ability in all of these areas. Therefore, a coach must help players develop and strengthen their abilities, then blend these attributes into the best possible team structure. First the coach must indentify the skills that are needed, then position the players where they will be most effective (Morgan Wootten with Dave Gilbert 2003).

1.4.1 Passing

Passing is one of the most important basic skills that all players should have. If a player cannot pass the ball effectively, then he will not be successful on
the court. Passing is also important because there is no faster way to move the ball around the court. With clear, crisp and quick passes one can beat the defense on the court. Passing is one important skill, which will certainly speed up the game. To make effective passes one needs a good peripheral vision and without making good passes a team can never be successful.

1.4.2 Dribbling

Dribbling skills is a most important skill which helps a player to penetrate the defense. A player needs good hand and eye coordination in order to excel in dribbling skill. A player who is coupled with good speed and agility along with good dribbling skill is the one who can be a treat to watch. It is a great skill and it differentiates the best from the ordinary players. A basketball player without proper knowledge of fundamental skills like foot work and basic dribbling skills cannot excel in dribbling.

1.4.3 Shooting

Shooting is the most important skill in basketball. Shooting is the more attractive skill than any other skill. Shooting is one important reason why people are attracted to watch this game. Without mastering this skill one cannot be said as a complete basketball player. The sole purpose of playing the basketball game
is only to score a basket by shooting the ball at the opponent’s basket. So this skill should be considered as the major skill to be mastered by any player. Mastering this skill in a player’s career shall be said as a perfect icing on the cake.

Learning how to shoot a basketball more effectively is a progressive process that requires specific and conscious actions that will help to improve both power and accuracy when shooting a basketball. The key is to practice these fundamentals persistently and consciously up until the point they become automatic. Shooting is a complex skill. To master the art, a player should not only learn the biomechanics of shooting but also need to work on to improve the strength, endurance and explosive power to enable a player to sustain in the competitive world.

1.4.4 Defensive Movement

Defensive movement is another major skill. All the players need to improve their lateral movements. Sliding is the drill to improve the defensive movements. A player needs to have strong legs to make quick and continuous defensive moves. If any team does not possess this skill then no matter how good they are in the other areas, they will certainly lose their grip over the match. A good player will be having proper defensive movements; he will be able to follow the cylinder principle who will ensure that player finishes the match with a minimum number of fouls against his name.
There are several other skills to be developed for a person to become a complete player. Some of the other important skills are post play, zone defense, man to man defense, half court press, full court press, weave, tactical training, strategies, game plan, etc.,

1.5 SPORTS TRAINING

According to Hardayal Singh (1984), Sports training is a process of preparation of a sportsman, based on scientific and pedagogical principles for high performance.

Training is now universally recognized as a scientifically based and systematized programme, which is fundamental to the pursuit of high-level performance in sports. All sports have drawn the attention of the maximum number of sports scientists and coaches to devise new training methods in order to achieve optimum performance. Due to this, a vast variety in the approaches to devise training loads had been made, and this has created a situation where players, in spite of following different methods of training have attained comparable levels of performance. Various systems of exercises for physical development have been emphasized by experts. Most often players select any one system based on the information available to them. Some people adopt the athletic method of conditioning mixing exercises from a number of systems without any clear idea of potential outcomes. Hence, there is a need to identify clearly the
scope of each system of training, detraining and retraining programme as well as the possible advantages of preparing a schedule of the training programme from the various systems.

As a training season develops, comprehensive conditioning work for strength and endurance will gradually form a transition into an emphasis on power with a substitution of intensity for volume in determining the total training load. Training is an effective antidote, against weakness. In the vast play field of life, the sports galaxy of players rests entirely on the foundation called ‘Sports Training’. When training progresses, the demand for aerobic energy increases and the number of size of muscle mitochondria also increases. So that in these ‘Chemical factories’, where aerobic metabolism takes place becoming larger and more numerous. This will enable the players to provide more energy from aerobic metabolism. There are three steps in the adaptation process. The first step involves creating the need for more aerobic energy. Training must be sufficient in both duration and intensity to accomplish this. The second step is to provide proper nutrients to build and repair mitochondrial tissues. The third step is that, the players must be given enough rest to build and repair those tissues. Finally, it will be necessary to increase the duration and intensity of training to create further adaptations once plateaus occur.

According to Harre (1982) sports training is a process of athletic improvement, which is conducted based on scientific principles and through
systematic development of mental and physical efficiency, which enables athletes to produce outstanding athletic performance. Training should be concentrated mainly on the development of the kind of condition that is required for the specific event concerned. Coaches have to use a variety of physical exercises and forms of workout, especially in training programmes in order to develop the essential prerequisites of high athletic efficiency.

1.5.1 Training Seasons

Pre-season training phase is the period of eight to ten weeks prior to competition in which training programmes are designed to increase the capacities of the energy systems to a maximum extent that are predominant when performing a specific event. In-season training phase is the period where the athlete achieves the top form and maintains it as long as required. High amount of training is devoted to the tactical and strategically preparation. The in-season or competition season is characterized by a high frequency of competitions, which should be in order of increasing difficulty.

Off-season phase of training programmes is usually non-specific. This season is relatively shorter than other seasons and aims at complete physical and physiological recovery. The volume and intensity in this season should be such that it guarantees active recovery as well as it is sufficient to maintain the training state.
1.5.2 Pre-Season Training

The pre-season training is the base creation for better performance in the competition. The various performance factors are developed sequentially in this period. The preparatory period is characterized by an increase volume of load as compared to the intensity of the load Hardayal Singh (1984).

According to Neal (1969) the pre-season training is the time to perfect skills, work on fundamentals, and ponder strategy and to strive for high level of conditioning for a specific sport. The pre-season training programme is a stepped up programme of conditioning with emphasis on strengthening the muscles involved in the sport and improving the players' endurance. This programme should lead to a gradual improvement in physical fitness with the peak being reached during the season.

Reilly (1990) has considered the pre-season training as highly important as it includes programmes of fitness training, which improve the aerobic power, and endurance capacities of players. Coaches should have a more circumspect approach towards pre-season conditioning and introduce a balanced programme of exercise.

Kriese (1989) has insisted that a good pre-season training programme should develop muscular endurance, which will enable the body to recover much faster after a day with the same level of excellence. It is essential for a player to follow a good flexibility programme every day to relax the body to guard against
injuries and to alleviate soreness from previous performance. A comprehensive
and through the programme of physical training will enhance a player’s
performance, increases confidence, improves technique production and develops
his athletic ability to its maximum potential.

Hardayal singh (1984) had divided the pre-season training into three phases
having different aims and contents. The first phase is aimed to increases the load
taking ability of sportsmen to regain the previous training state and to develop the
general phase for future performance. The volume of training is sharply increased.
In this phase, more stress is made on the development of general and overall body
strength, general and basic endurance. The technique training aims at relearning
of skills and learning of new skills. Very less work needs to be done on
conditioning and technique efficiency. Theoretical sessions should be held for
informing rules, latest tactics and systems followed and various ways and means.

During the second phase, the performance factors, which are directly
related to the specific event, are given more stress like endurance and leg strength
of a footballer. Harre (1982) has stated that the volume of general exercises should
be reduced in favour of the most effective special exercises. The technique should
be stabilized mainly by workouts specific to competition. The volume and
intensity of the load are a further increase. The volume of tactical training also
increases, but it is less compared to conditioning and technique. In addition to
theoretical knowledge individual, positional and fundamental tactics are started.
The third phase aims at direct preparation of the sportsmen for the competition period and maintenance of the previously developed training state. Integration of all the performance factors is done so that the sportsmen can participate in the competitions with success. The volume of load is gradually reduced and there is a rapid increase in intensity of load. In technique training automisation of the skills is done and the ability to apply learnt skills under the difficult and competition situation is developed. In addition to theoretical sessions, group and team tactics are developed. The volume of tactical training is increased considerably.

Matweuew (1981) has insisted that the pre-season training should be done in meso-cycles. Each meso-cycle should aim at the improvement of only 2-3 factors and at the maintenance of other factors. The meso-cycle system must be set up according to the aim of the training, available time, the state of performance and with the special features of the particular sport.

The load dynamics in the preparatory period is arranged in such a way that the volume increases initially and intensity increases in the end. It is further emphasized that to develop load tolerance a training period of one or two weeks must be devoted to threshold loads so that the adaptation processes are generated with sufficient intensity.
1.5.3 Frequency and Duration of Pre-Season Training

Hardayal Singh (1984) frequency is the number of times a motor stimulus (repetition) is given. Frequency of stimulus and intensity are inter-dependent. The higher the intensity, the lower will be the frequency and vice versa. The duration of the preparatory period can be from about six weeks to 7-8 months. The duration is mainly determined by the macro-cycle, training state of a sportsman, age of the sportsmen and means and methods of training.

For the present study, since the subjects are college level players who have basic fitness and skills, for the specific pre-season training, the frequency of training taken as six days per week and duration of twelve weeks. Two sessions per day are necessary to allow for the large volume of training.

1.5.4 Intensity of the Training

The intensity of a training programme shall be determined by the use of technology, modern electronic and computerized equipments which are best suited to the trainees and to the demands of an effective conditioning programme.

William et al. (1986) had specified a running speed method for determining the intensity for speed training. In this method, for 50 yards distance 1.5 second is added to the runner’s best time, for 100 yards and 200 yards the training times can
be 3 and 5 seconds respectively more than the athlete best time for the particular distances.

A heart rate of 180 to 190 beats minute during the work interval, which indicated that the work is sufficiently intense. However, another method, repetition method is based on the number of repetition possible per workout, for example, the number of 50 yards runs in the workout should be between six to eight. The intensity is such that the athlete is not exhausted but unable to run any additional repetition. Intensity of 10-15 repetitions of flexibility exercises to develop dynamic flexibility. Furthermore, static flexibility should be improved with flexibility exercises in which joints are slowly moved to its maximum limit and held for 4-8 seconds to start with.

A repetition maximum is the maximal load a muscle of the muscle group can lift a given number of times before fatiguing. For example, if a person can lift a particular weight eight times and no more before fatiguing, that weight is an 8 RM load. A 1 RM load is the maximal amount of weight that a person can lift only one time. According to Delorme and Watkins, the best suitable starting load for strength training is two sets of 10 RM load.

1.5.5 Weight Training

In the earlier years coaches would not let basketball strength training be a part of their program for fear of ruining their player's shooting ability. As more
coaches have become aware of the benefits of building strength for their basketball players, the myths have been erased, and basketball strength training has become an important aspect of building a competitive athlete.

Today's athlete needs to be able to sustain their high performance level as the game becomes more and more physical. Strength training can help increase the durability, self-confidence, and athletic performance. Stronger players are more aggressive players. They rebound more, attack the basket more, and play tougher defense.

A good strength program should be specific to the specific sport, with exercises that will improve the skills that are needed for basketball. Strength training for basketball can significantly reduce the risk of joint and tendon injuries. As the game involves continuous bouts of play at a fast rate, a high level of endurance must be developed. Strength, endurance, agility and flexibility are considered as the four important parameters for Physical Fitness of the player.

1.6 NEED OF THE STUDY

Basketball is fundamentally a game of effective spacing and movement that requires precision in passing, communication and team chemistry that helps to synchronize the movement of the player with the ball and his teammates without the ball. In fact, when it comes to pure efficiency and effectiveness on the basketball court, it is equally, if not more important to move well without the ball
when compared to move with the ball. And it is these dynamics that separate the
great players from the rest. To become a complete player one has to be trained
systematically in various aspects such as physical, physiological and skill
performance factors. Training a basketball player is a big process, right from the
fundamentals until he becomes a master. Since the competition grows up at the
advance level, training methods are being given a serious view.

This study is intended to find out the effect of the pre-season training
package on the selected physical, physiological and skill performance variables of
inter collegiate level male basketball players.

1.7 STATEMENT OF THE PROBLEM

The purpose of this study is to test the effect of the specific pre season
training package on the physical, physiological and skill performance variables of
college level male basketball players.
1.8 HYPOTHESIS

I In testing the individualized effect of a specific pre-season training package on selected variables, the following hypothesis has been formed.

a) It was hypothesized that the specific pre-season training package would produce significant changes on selected physical fitness variables from baseline to post-treatment on subjects of the experimental group.

b) It was hypothesized that the specific pre-season training package would produce significant changes on selected physiological fitness variable from baseline to post-treatment on subjects of the experimental group.

c) It was hypothesized that the specific pre-season training package would produce significant changes on selected skill performance variables from baseline to post-treatment on subjects of the experimental group.

II In testing the comparative effect of the specific pre-season training package followed by the experimental group and normal routine followed by the conventional group on selected physical, physiological and skill performance variables, the formulated hypothesis is as follows.

a) Specific pre-season training package followed by the experimental group may have significant improvement on selected physical, physiological and skill performance variables than the normal routine followed by the conventional group.
1.9 SIGNIFICANCE OF THE STUDY

This present study may be significant in the following ways:

1. The results of the study may help to train the selected physical variables of college level men basketball players.

2. The results of the study may help to train the selected physiological variable of college level men basketball players.

3. The results of the study may help to train the selected skill performance variables of college level men basketball players.

4. The results of the study will help the coaches of the college teams to train their players with the specific level of intensities.

5. It will help the coaches of the university teams to design their own module to train their players with the specific level of intensities.

6. It will help the players to know their standards on the specific physical, physiological and skill performance factors.

7. The findings of this study would add to the quantum of knowledge in the area of sports training and sports psychology.
1.10 DELIMITATIONS

The present study was delimited into the following aspects:

1. This study was delimited to male basketball players who had participated in the inter-collegiate level basketball tournaments.

2. This study was delimited to 60 male basketball players studied in Coimbatore district only.

3. This study has been delimited to basketball players between the age group of 18 and 23 years.

4. This study was confined to a training period of 12 weeks with six days per week.

5. This study was delimited to variables such as,
   
a) Physical variables
      
      Speed, flexibility, abdominal muscular strength and endurance, agility and explosive power
   
   b) Physiological variable
      
      VO₂ Max
   
   c) Skill performance variables
      
      dribbling, passing, shooting and defensive movements
1.11 LIMITATIONS

The present study was limited to the following factors:

1. The previous experience of the subjects in the field of sports and games, which might be influencing on the training and data collection, was not considered.

2. Psychological factors, food habits, rest period, lifestyle etc. could not be controlled.

3. The weather conditions such as atmospheric temperature, humidity and meteorological factors during the testing and training period were also not considered.

4. The study was limited to the daily routine of the selected players.

5. The study was limited to the heredity factors of the selected players.

1.12 DEFINITION OF OPERATIONAL TERMS

1.12.1 Aerobic Capacity

It is a capacity to do a work at a steady and manageable pace. For eg., long continuous running, where the body is working with oxygen.
1.12.2 Anaerobic Capacity

It is the capacity to do a work in short, very intense bursts. For example, fartlek an interval training, where the body is working without oxygen, and it produces a product called lactic acid.

1.12.3 Field-Goal

A field goal is said to be made when a live ball on the court is passed through the basket from above the level of the ring.

1.12.4 Shooting

Shooting may be defined as the act of propelling the ball towards the goal in a type of throwing action with the use of two or one hand.

1.12.5 Dribbling

Dribbling is a repetitive action in which a player uses one hand to bounce the basketball continuously that is without interruption on the court. It ends the moment that continuity ends.

1.12.6 Speed Dribble

It is the ability to dribble the ball to the maximum speed, passing the hurdles.
1.12.7 Speed

Speed is the rate of which a body can propel his body through space. Speed is the capacity of moving a limit or part of the body’s lever system or the whole body with the greatest possible velocity.

1.12.8 Muscular Strength

Muscular strength is the maximum amount of force that can be exerted by a muscle.

1.12.9 Muscular Strength and Endurance

Muscular strength and endurance refer to the ability of a muscle or a group of muscles to perform repeated contractions against a light load for an extended period of time.

1.12.10 Maximal oxygen consumption

The maximal amount of oxygen that can be consumed per minute during the maximal exercise and it is abbreviated as VO₂ max.

1.12.12 Agility

Agility is the physical ability, which enables the individual to change direction rapidly in a precise manner.

1.12.13 Flexibility

Flexibility is the range of movement in a joint.
1.12.14 Explosive Power

Explosive power is the capacity of an individual to bring into play maximum muscle contraction at the fastest rate of speed.

1.12.15 Training

Training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performance in sports competitions.

1.12.16 Pre-Season Training

The period eight to ten weeks prior to competition is considered as the pre-season. Training programmes in this period are to be designed to increase maximum capacities of the energy systems that are predominant when preparing for an event. Another important factor to be considered during this phase of training is the learning of strategies and skills specific to the sport.

1.12.17 Specific Training Package

Specific training package means a systematically and scientifically prepared programme which consists of conditioning exercises, physical activities, drills and tactical maneuvers designed to improve the physical fitness, techniques and playing ability of the players.