Chapter - I

INTRODUCTION

Today the sporting the world has become of extremely competitive. Every person who indulges in training for a sport will not necessary render the top most performance or become a champion. It is rightly said that the champions in the field of sports are born and then groomed in later life. Thus the genetic endowment of a sports person cannot be neglected while selecting the talent. Further, the collection of sports persons should be based on through assessment and screening of the individual with regard to those pre-requisites that will enable him to accomplish elite performance in future. It becomes important to sketch the physical, physiological and psychological profile of sports persons. This will assist in converging and directing the sports persons to the most appropriate sport in accordance with the qualities possessed (Tiwari, 1999).

Physical training entailed exposing the organism to a training load or work stress of sufficient intensity, duration and frequency to produce a noticeable or measurable training effect, that was, to improve the functions for which one was training. To achieve such a training effect, it was necessary to expose the organism to an overload (i.e., a stress) that was larger than the one regularly encountered during everyday life. It was a common conception in training environment that to build up, one must first break down. Admittedly, exposure to training stress was associated with some catabolic response that causes an increased deposition of the molecules that were mobilized or broken down during training. As to the effect on other cellular components, this statement was the best and the most impressive. Today, the molecular mechanisms involved in training responses have started to emerge, but the pictures were still far from completion. As a basis for studying the training process, however, one could safely state that all cells and

tissues of the body, regardless of their presence or absence of the training, were subject to some kind of continuous exchange and remodeling. On the cellular level, molecules had a restricted lifetime and are constantly replaced by new molecules of the same kind or by another iso-form of the same molecules if so demanded by current activity level. (Astrand, 2003).

Exercise and sport scientists actively engage in research to better understand the mechanisms that regulate the body's physiological responses to acute bouts of exercise as well as its adaptations to training and detraining,(Willmore,2008).

1.1 Meaning of Training

Any program of exercise designed to improve the skills and increase the energy capacities of an individual for a particular activity is called training **(Anshel, et a1., 1991)**.

Generally, training is understood to be a synonym of doing physical exercise. In the narrow sense, training is doing exercise for the development of performance **(Singh, 1991)**.

Training implies participation in a program of regular and vigorous physical activity with the primary intention of improving physical performance or health through.

A distinction should be made between physical activity and exercise. In general, physical activity involves many bodily movements caused by muscular contractions that result in the expenditure of energy. In this sense, physical activity includes many of the usual activities of daily life, such as occupational work and leisure time activities. Exercise is considered to be a sub category of physical activity. It is a planned programme designed to develop or maintain specific components of fitness. Both are important components of a healthy lifestyle. But exercise appears to be one of the major elements

in health lifestyle. But exercise appears to be one of the major elements in the health promotion movement.

Only through proper training, one could have improvement in his performance. Sports training is a systematic process extending over a long period. For best results, the system of training has to be based on and conducted on scientific facts. There are 3 basic rules, which should always be followed in training. These corner stones of any successful system of training are1) moderation (not going to extremes in any aspect of training) 2) consistency (one way to avoid extremes in training and to train at a reasonable level everyday) and 3) Rest (perhaps the most important one for younger athletes **(Bower man and William, 1991.)**

Training has to be uniform, scientifically justified, and must have a methodological approach to understand the tasks of the theory of training. On this basis, the actual system of training for a certain sport can be developed.

1.2 2 Need for Training

Training helps to develop good physical fitness. Individualized training program is also necessary. Training involves the development of individuals for specific events and deals equally with the improvement of skills and conditioning **(Rich, 1990).**

The long term benefits of training in terms of health and fitness are well known, including reduced risk major health problems and improvement in cardio-respiratory function, muscular strength and endurance, flexibility and reduction of fat **(Howely and Don, 1997).**

Physical exercise contributes to improved posture and appearance through the development of proper muscle tone, greater joint flexibility and a feeling of well being. Training generates more energy and thus contributes to greater individual productivity for both physical and mental tasks. Besides promoting vigour and fitness, physical

activity contributes to improvement in agility, speed, coordination and skill **(Prentice, 1994).**

Therefore, it is understood that training is necessary to develop and maintain an optimal level of health performance and physical appearance. Research has shown that regular training enhances the functions of joints, increases the sense of well being and promotes a sense of feeling good. It also increases physical working capacity by increasing co-ordination, flexibility and balance. In addition, it provides an outlet for the dissipation of tension and mental fatigue, aids in weight reduction, improves posture and contributes to youthful appearance.

1.3 General Principles of Training

Training is a systematic process. To train properly one must observe certain guidelines. One does not need to be an expert in physiology to conduct sound training programs but he must understand the principles of training and it is classified into a) specificity b) overload c) individual response and d) variation **(Sharkey, 1986).**

The term training refers to a planned program of exercises directed towards improving the functional capacity of a particular body system. This improvement does not occur all of a sudden, but requires adherence to carefully planned and executed activities. Attention is factors such as frequency, length of workout, type of training, speed, intensity and repetition and the principles such as overload, specificity and reversibility **(Katch and William, 1993).**

Performance can be increased or improved to a great extent only by causing biological adaptations and this is possible only through systematic and scientific principles of training. Specificity of exercises and overload principle should be followed in order to enhance the functioning efficiency of the various systems of the body.

Numerous training procedures are in practice to improve each and every motor fitness abilities at various levels.

1.4 Break-in Training

Research studies proved that it is necessary to exercise five days per week to improve cardio-vascular efficiency. Three days per week are sufficient to retain these gains. But only two days per week are necessary for strength and maintenance. When one reduces training and deemphasizes flexibility, the benefits acquired from training are short lived **(Camaione, 1993).**

Coaches are aware that many high school and college athletes do training only just prior to and during competition. Detraining brings the efficiency to the initial level. Attempting to retrain those athletes late in their athletic career can be challenging, frustrating and emotionally charged. Retraining an athlete's mechanics requires patience and professional cooperation.

1.5 Games and Fitness

Games and sports are a popular pastime for young and old, for boys and girls and for men and women. They offer opportunity for all to obtain exercise, fun and relaxation. They can play an important role in developing physical fitness and skills for use in leisure time now and perhaps more important in later years. Many of the skills developed through games and sports may be used in years to come to help to keep physically fit.

Physical fitness is somewhat exact in its meaning; indicating specific components we might measure to reflect a person's fitness status. The sensible organic ingredients of physical fitness include muscular strength, muscular endurance, flexibility, cardio-vascular endurance or cardio respiratory endurance, agility, speed and neuro-muscular co-ordination. Fitness is for everybody and not just for youth. This makes fitness every body's business. It is also a part of life for people who want to be fit, need exercise or

actively participate in some of the major games. Most people take better care of their automobile than do for their own bodies.

Most team games such as Football, Hockey, Netball and Basketball require the development of different physical capacities for optimal performance. For example, the physical capacity of speed is required to beat opponents, strength is needed for body collisions and physical contacts and endurance capacity allows the player to recover and repeat the sports performance **(Reaburn and Aaron, 2000)**

Fitness is certainly a component in preparing a team. Fitness in a game, which very demanding physically and mentally is obviously a priority in preparing a team sport **(Simpson, 2005).**

Coaches and players need to bring to the game a firm understanding of what it takes to be successful and then devise a plan that accomplishes the desired goal. One can see young players excel in high school but fall behind as they progress to college. It is because they don't think about their physical fitness and the detraining effects. They don't sort a specific program for skill development. Therefore, one should understand the fundamentals of the game and how to apply that knowledge to the particular needs.

Fitness includes mental, emotional and social as well as the physical aspects and all these components of total fitness play a significant role for a full and happy life. To be physically fit, one should participate in some of the activities in sports and games to give exercise to all parts of the body. The nature of the exercise depends upon the age and sex of an individual.

1.6 6 Circuit Resistance Training

The caloric cost of exercise can be increased to bring about improvements in more than one aspect of fitness by modifying the standard approach to resistance training. This approach, called circuit resistance training (Heward, 2010).Circuit resistance training, de-emphasizes the brief intervals of heavy-local muscle overload, providing a more general conditioning to improve body composition, muscle strength and endurance, and cardiovascular fitness (Ballor, 1987). With this approach, a person lifts a weight between 40 and 55 percent of the1-RM. The weight is then lifted as many times as possible for 30 seconds. After a 15-second rest, the participant moves to the next resistance exercise station and so on to complete the circuit. Between 8 and 15 exercise stations are usually used. (A modification that appears to result in similar energy expenditures during CRT is to employ exercise-to-rest ratios of 1:1 with either15- or 30-second exercise periods, (Ballor, 1989). The circuit is repeated several times to allow for 30 to 50 minutes of continuous exercise. As strength increases, a new 1-RM is determined and the weight lifted is increased accordingly at each station.

This modification of standard resistance training is an attractive alternative for those desiring a generalized conditioning programme. Medically supervised programmes of circuit resistance training also have been effective for coronary-prone, cardiac, and spinal-cord-injured patients who desire a well-rounded fitness programme using resistance exercises. It also may provide supplemental off-season conditioning for athletes involved in sports that require high levels of strength, power, and muscular endurance (Cooney, 1986). Circuit resistance training is a method of dynamic resistance training designed to increase strength, muscular endurance, and cardio respiratory endurance (Gettman and Pollock 1981). Circuit resistance training compares favourably with the traditional resistance training programmes for increasing muscle

strength, especially if low-repetition, high-resistance exercises are used (Wilmore et al. 1978).

A circuit resistance training programme usually has 10 to 15 stations per circuit. The circuit is repeated two to three times so that the total time of continuous exercise is 20 to 30 min. At each exercise station, a resistance that fatigues the muscle group in approximately 30 sec is selected (as many repetitions as possible at approximately 40% to 55% of 1-RM). 15 to 20 sec rest period between exercise stations is included. Circuit resistance training is usually performed three days/wk for at least six weeks. This method of training is ideal for subjects with a limited amount of time for exercise. Subject can add aerobic exercise stations to the circuit between each weightlifting station (i.e., super circuit resistance training) to obtain additional cardio respiratory benefits (Heyward, 2010).

1.6.1 1 Developing resistance training programmes

Before designing a resistance training programme for the subject, training principles have to be revived. Further, how these principles can be incorporated in to the subjects programme should be determined. The training program needs to be individualized by varying the combination of intensity, duration, and frequency of exercise.

1.6.2 2 Application of training principles to resistance exercise

To develop effective resistance training programmes, subjects must apply each of the training principles. This section reviews some of the more pertinent training principles and outlines how these principles are applied to the design of resistance training programs.

1.6.3 3 Specificity Principle

The development of muscular fitness is specific to the muscle group that is exercised, the type of contraction, and training intensity. To increase the dynamic strength of the elbow flexors, for example, subject must select exercises that involve the concentric and eccentric contraction of that particular muscle group. For strength, the person performs exercises at a high intensity with low repetitions; exercising at a low intensity with high repetitions stimulates the development of muscular endurance. Strength and endurance gains are also specific to the speed and range of motion used during the training. With isometric training, strength gains at angles other than the training angle are typically 50% less than those at the exercised angle. Similarly, as previously noted, strength gains in isokinetic training may be limited to velocities at or below the training velocity (Lesmes et al. 1978; Moffroid and Whipple 1970).

1.6.4 4 Additional Principles

Individuals with lower initial strength will show greater relative gains and a faster rate of improvement in response to resistance training than those starting out with higher strength levels (principles of initial values and interindividual variability). However, the rate of improvement slows, and eventually plateaus, as subject progresses through the programme and move closer to their genetic ceiling (principle of diminishing returns). Additionally, when the individual stops resistance training, the physiological adaptations and improvements in muscle structure and function are reversed (principle of reversibility). Using periodization techniques, one can lessen the effects of detraining on athletes and maintain strength gains during the competitive period by manipulating the intensity and volume of the resistance training exercise (Wathen. D. 1994).

1.6.5 Procedures for training programmes

The primary goal for this programme is to develop adequate muscular fitness so that the subject can retain functional independence. This programme follows the guidelines suggested by ACSM (2010) for designing resistance training programmes for older adults. During the first four week of training, low-intensity (30% to 40% 1-RM), high-repetition (15 to 20 repetitions) exercises familiarize the subject with weightlifting exercise and reduce the chance of injury and excessive muscle soreness. The subject gradually increases the resistance so that by the end of this phase, the exercise intensity is 50% 1-RM. After eight weeks, the intensity starts at 50% 1-RM and gradually increases to 75% 1-RM. The subject does one or two sets of 10 to 15 repetitions for each exercise. To overload the muscles during this phase, he increases the resistance gradually, but only after he is able to complete 15 or more repetitions at the prescribed relative intensity. This programme includes multi-joint exercises using exercise machines only (no free weights). The subject exercises two times a week, allowing at least two days of rest between each workout.

1.7 7 Resistance Training Programme

Based on the subject's goal, time commitment and access to equipment, the type of resistance training programme (i.e., dynamic, static, or isokinetic) must be determined. Using results from the subject's muscular fitness assessment, identify specific muscle groups that need to be targeted in the exercise prescription must be identified. In addition to core exercises for the major muscle groups, exercises must be selected for those muscle groups targeted in step. For novice weightlifters, the exercises must be so ordered that the same muscle group is not exercised consecutively. Based on the subject's goals, appropriate starting loads, repetitions, and sets for each exercise must

be determined. Guidelines must be set for progressively overloading each muscle group.

The third example illustrates an advanced resistance training programme developed for an experienced weightlifter (28 yr old male with superior strength) whose long-term goal is competitive bodybuilding. He engages in a high-volume undulating periodized training programme. The intensity (70-85% 1-RM) and moderate repetitions (6 to 12 reps) vary systematically throughout each macro- and micro cycle to maximize the development of muscle size. To achieve a high training volume, he performs three exercises for each muscle group and three or four sets of each exercise. To effectively overload the muscles, he performs three exercises for each muscle group consecutively (tri-sets) with little or no rest between the sets. He lifts weights six days/wk, splitting the routine so that he is not exercising the same muscle groups on consecutive days. With this routine, each muscle group is exercised two times a week.

1.7.1 1 Resistance training programmes for children

Children and adolescents can safely participate in resistance training if special precautions and recommended guidelines are carefully followed. Because children are anatomically and physiologically immature, high-resistance training programmes are not typically recommended for them. Most experts agree that to lessen the risk of injury to developing bones and joints (e.g., epiphyseal growth plate fractures), exercise intensity should not exceed 80% 1-RM, which equates to eight to fifteen repetitions per set. Faigenbaum and colleagues, (1999) reported that high-repetition-moderate-intensity training (one set, 13-RM to 15-RM) was more effective than low-repetition-high-intensity training (one set, 6-RM to 8-RM) for improving the strength and muscle endurance of children (5-12 yr) during the initial training phase (8 wk). Strength gains in resistance-trained children result from neural adaptations (e.g., increased activation of

motor units and coordination) rather than from hypertrophy (Guy and Micheli 2001). In addition, resistance training positively affects the bone mineral density of the femoral neck in adolescent girls aged 14 to 17 yr (Nichols, Sanborn, and Love 2001). There is no evidence that children lose flexibility when they resistance train (Guy and Micheli 2001). Resistance training is safe and beneficial for youth, especially when the established training guidelines are followed. These guidelines are based primarily on recommendations outlined in the Canadian Society for Exercise Physiology.

1.7.2 2 Resistance training programmes for adult

Resistance training provides many health benefits, especially for older adults. The primary goal of the resistance training programme is to develop sufficient muscular fitness so that older adults may carry out activities of daily living without undue stress or fatigue and may retain their functional independence. In addition to increasing strength and muscular endurance, resistance training may improve the performance of functional tasks such as lifting and reaching, rising from the floor or a chair to a standing position, stair climbing, and walking (Henwood and Taaffe 2003; Messier et al. 2000; Schot et al. 2003; Vincent et al. 2002). Besides, the postural sway and balance of older, osteoarthritic adults improved by participation in either long-term resistance training or aerobic walking (Messier et al. 2000).

Improved strength and balance may help prevent falls and injuries to older adults. The ACSM (2010) recommends moderate-intensity (rating of perceived exertion [RPE] = 5-6) to vigorous-intensity (RPE = 7-8) exercise at least two days/wk to improve the muscular fitness of older adults. At least one set of 10 to 15 repetitions for 8 to 10 different exercises each workout should be prescribed. Vincent and colleagues (2002) noted long-term (6 mo) improvements in the strength and muscular endurance of older adults (60-83 yr) who participated in either a low-intensity (one set at 50% 1-RM) or a high-

intensity (one set at 80% 1-RM) resistance training programme three days/wk. Likewise, Hunter and colleagues, (2001) reported that isometric and dynamic muscle strength gains are similar for older adults (>60 yr) engaging in either a nonperiodized, high-intensity programme (two sets at 80% 1-RM, 3 days/wk) or an undulating periodized (UP) programme varying training volume each day (two sets at 50%, 65%, or 80% 1-RM, three days/wk). Some evidence suggests that training one, two, or three days a week at 80% 1-RM produces similar strength gains in older (65-79 yr) adults (Taaffe et al. 1999). In addition to the general guidelines for designing resistance training programmes for healthy adults, the following guidelines and precautions are recommended for older adults: During the first eight weeks of training, minimal resistance must be used for all exercises. Older adults must be instructed about proper weightlifting and breathing techniques. Trained exercise leaders who have experience working with older adults should closely supervise and monitor the subject's weightlifting techniques and resistance training pro-gram during the first few exercise sessions. Multipoint exercises rather than single joint exercise must be prescribed. Exercise machines to stabilize body position and to control the range of joint motion must be used. Using free weights must be avoided with older adults. Each exercise session should be approximately 20 to 30 min and should not exceed 60 min. Older adults should rate their perceived exertion during exercise. Ratings of perceived exertion should be 5 or 6 (moderate) or 7 or 8 (vigorous).

1.8 8 Football

In today's techno-scientific age, the world has undergone a complete change in all aspects due to innovation and research. Thus, in the field of Football there has been a dramatic change with the help of scientific training and coaching. The players are being trained on scientific guidelines with highly sophisticated means, for effective improvement enabling the coaches to derive optimum performance within legitimate

time span. During training the players are being exposed to such exercises that are helpful and beneficial for achieving the higher standards. Training denotes the process of preparing one for some task. Sports training is undertaken for improving sports performance. An ergonomic model of training is described in which the demands of the game and the fitness profile of Football players are played in perspective. (Fahey, et al 1997). Athletes training are a multi-sided process of expedient use of aggregate factors (mean, methods and conditions) so as to influence the development of an athlete and ensure necessary level of preparedness.

The world of sport has stepped into the future millennium, carrying the popular game of Football. Millions of Football lovers across the world will continue to vibrate to this simple and feasible game. The greatest asset of Football is played by king Pele in Brazil, Becken Bower in Germany, Rooney in England or our own, Baiching Bhutia and I.M. Vijayan in the minds of the people, the status in various countries continue to be at different level. India is frantically attempting to revamp the system to recapture its lost glory in world Football. What India lacks and needs at the moment is the right scientific approach to the game of Football. Football is not a matter a life and death, it is more important than that. Football has come from a very long way and it shows the sign of retreating to the playroom shelter of its humble origins. As long as the human face is able to concern itself with more than mere survival, the Football will have its place (Desmond Morris, 1981).

1.9 9 Fitness For Football

The game of Football demands a high level of fitness that will enable the players to run strongly, to move quickly off the mark in any direction to control, to pass accurately and to tackle efficiently throughout the game. Football requires a fairly high standard of physical fitness along with skills. Since the game of Football is played for 90

minutes (if necessary an extra period of 30 minutes if the match ends in a draw in knock out tournament) it demands a high level of physical fitness and the training programme should be planned accordingly. The player needs good physical condition throughout the game to have the ability to do sustained work over a longer period. Hence speed, power, strength, endurance, agility and cardio respiratory endurance are essential qualities required to be developed by all players. For good performance in any sports the standard of fitness is a basic requirement.

1.10 Motor Fitness Variables

Football, at any age, is a physical game. It involves running. It involves twisting and turning. It involves jumping and kicking and tackling. As young players mature, the stresses and strains of the competitive environment become greater and greater. Football is fitness dominating sports along with technical and tactical skills. Physical fitness is used to denote the sum total of five components. i.e. strength, speed, endurance, flexibility endurance and their complex form. Skill related physical fitness is more a comprehensive term, which includes all the fitness components including additional five motor components i.e., power, speed, agility, balance and reaction time, which are important mainly for success in sports. In AAPHER Youth Fitness Test, there are six components of physical fitness, which are enlisted as, muscular strength, muscular endurance, speed, agility, explosive strength, and cardiovascular endurance.

Various authors and experts have viewed physical fitness differently but all are of the opinion that it is very important for all the high intensity sports such as football, volleyball, rugby, basketball etc. The scientific approach offers broad spectrum of research work in sports and gives interesting overview on various aspects of scientific services in elite sports. Although an enormously high level achievement could be reached in high performance sports for nearly every sport, the end of development of performance

is not yet in sight. Even when performance improvements are realized in even smaller increment, one can assume that it may require a long time for substantial improvement in future. But in future, improvement at international level performance may well proceed above all on the basis of improvement in the quality of training and not so much from increase in the scope of training. The movements in Football are varied and each movement calls for thousands of discrete movements, rapid and frequent changes of pace and direction, implementation of skills, such as, dribbling, kicking, shooting and throwing etc. Therefore, it is difficult to find a player who is proficient in all the required movements. A subjective approach to describe a player's abilities in various movements is not sufficient in modern coaching. As such, subjective judgments fall far short of objective information, individualization must be adhered to in all the stages of training. The strong and weak points must be realized and the training should be directed to further refining the strong points and weakness minimizing (Costill, 1979).

1.10.1 1 Importance of motor fitness variables

The Performance variables are highly important in the achievement of outstanding results in sports performance. Though one of the performance variable like speed as an innate quality, proper scientific training tends to improve most of the performance variables. The majority of sports events and competitions includes performance variables such as speed, power, strength, endurance, agility and cardio respiratory endurance, that often decide the fate of the event. High level performance of a football player may be depending upon his physical capabilities supported by other factors. In most of advanced and developed countries the awareness of the fitness, motor learning and skill development among children in early age itself are very much scientific to realize their dreams of high achievements in sports. High level of general fitness with motor abilities like speed, power, strength, endurance, agility, cardio respiratory endurance, jumping

activity and balance etc., are essential qualities required to be developed by Football performance.

1.10.2 Basic skill required for football player

Genetic factors play an important part in defining the physical abilities of players. However, anybody can develop this part of the game by undergoing systematic fitness programmes to meet the requirements of the game based on individual peculiarities. In the case of younger players, simply playing the game can also initially develop fitness. To get fit for professional football requires much dedication, as training is often very demanding. High levels of endurance, speed, capacity to accelerate, strength, explosive power, agility, and neuromuscular co-ordination, are required and needed to be developed as much as possible. In general, top players demonstrate greater physiological capacities compared to players at lower levels. The physical requirements of the modern professional game are also higher; players are required to run more and challenge more often for possession. Not every player is blessed with natural athletic ability, but this can be developed in order to keep up with the basic physical demands of the game so that the player's individual technical and tactical abilities can be used maximally (Fleck, S.J. 1999).

1.11 1 Fundamental Skills In Football and Its Importance

The game of Football is very complicated in terms of skills and team- work. Control of the Football ball is perfected by the development of fundamental skills like shooting, passing, dribbling, trapping, tackling, heading etc. The unpredictability of the action sequences fosters imagination of a kind that can be transformed instantly in the physical movements. Physical fitness components like strength, co-ordination, flexibility, agility, endurance, speed, power etc., are considerably required to carry out

these movements effectively. Thus high level of performance in Football depends upon the mastery over the fundamental skills. To play Football at any level, we need a great measure of a number of attributes such as speed, strength, stamina, judgment, courage, agility, tactical ability but above all, the basic skills are needed. Foot ball is a game, which revolves around the effective utilization of fundamental skills such as shooting, passing, heading, throwing, tackling etc., and a general aptitude of ball sense and ball control. Among these fundamental skills the investigator has chosen some of the following skills for the study, namely, passing, dribbling, shooting (kicking). The fundamental skills in Football are quite different from those of most sports because the entire body can be used to play the ball with the exception of the arms and hands which are the sole allowance to the goal keeper. All sports involve the application of skills of same kind, cognitive, intellectual, perceptual or motor. Foot ball involves all three skill types, operating simultaneously in a rapid changing environment. Football skills involve making correct decision and then executing that which has been decided upon.

1.11.1 Passing and its importance

Football is a passing game. The mechanics of the modern game of football are centered on this skill. The skills pertaining to passing are interrelated and therefore should be practiced and refined together these skills are the means by which the attacking team moves a ball towards a goal for which the players should be prepared to be effective with a wide range of passing skills. They should be able to make short passes, medium, passes and long passes with accuracy and on many occasions with power; by the same token they should be able to receive and control these passes. The greater percentage of passes in a game is short passes and therefore more time should be assigned to developing these abilities. This does not mean that we should neglect practicing long passing because long passes are very important in switching play from one side of the field to the other in

attacking and in counter attacking. However, as ball possession is very important in the modern game, it is better accomplished with the short pass.

1.11.2 2 Dribbling and its importance

Dribbling is propelling the ball from one place to another without losing its control. But according to the situations, the ways of dribbling will differ. Yaxley remarked the goal dribbler must have the ability to keep the ball within the playing distance whilst running with the ball, to change direction quickly without losing the ball, to change speed (from slow to top speed instantly) without losing the ball, to screen the ball from his opponent when necessary and place his body between the ball and his opponent, and whilst dribbling he must be able to see team mates, opponents and own position to goal. Even though dribbling is one of the most fundamental skills in Football, when it is done too often and for too long a time, it can completely distract a team's offensive or protection pattern. Therefore it is very important to remember that dribbling is never justified if there is an unguarded teammate waiting for a pass. A safe pass is always better than unnecessary dribble. The importance of dribble comes into picture when good passing opportunities are not available. The significance of dribbling becomes clear when the attacker beats an opponent and takes a shoot at the goal. Dribbling can be used as the strongest weapon as an opponent is beaten by a player who is dribbling. The team in possession of the ball may often gain a numerical advantage in attack since the beaten opponent now finds himself behind the ball and temporarily out of play. However it is generally not advisable to take on a second opponent, since this will take time that can permit the first beaten man to recover and place him back in defending position. Therefore effective uses of dribbling are actually the true expression of individually. Even though much importance is not given to dribbling in modern Football, due to the concept of space and power, there will be many situations where this skill is effectively

carried out to initiate attack and ball possession. Therefore in modern Football, dribbling out of position before passing to get around an opponent if there is a clear field beyond him, to get by any opposition before a shot at goal if other team mates are highly marked or likely to violate the offside rule, to move the ball to a proper position before taking a shot and to initiate attack down the wining before crossing, dribbling has to be restored.

1.11.3 3 Shooting and its importance

Football is a shooting and running game “since shooting the ball is the essence of Football”. This is one of the first fundamentals to be learn't. Shooting is the most common method used in moving the ball to a teammate controlling the ball from loosing possession, shooting for score, clearing the defensive area and placing the ball back into play after a violation. Shooting can be mainly categorized as instep kick, which is distance controlled elevations and controlled direction. The fully mastered instep kick is a free natural ballistic type of movement immediate shooting is vital in Football because it scores the goals. The more shots at goal a team take, the greater is the chance of scoring goals and winning matches. Obviously the ability to shoot with either foot under pressure from defending opponents is essential. The type of shooting differs from situation to situation and hence the mastery over all types of shooting is highly essential to different aspects of the game such as clearing the ball, scoring the goal, distribution of the ball, etc.

1.12 2 Statement of The Problem

The purpose of the study was to find out the efficacy of circuit resistance training and football skill based drill training on motor fitness and skill performance variables among college football players.

1.13 Objectives of The Study

1) The first objective of the study was to examine the effects of circuit resistance training on motor fitness and skill performance variables among college football players.
2) The second objective of the study was to observe the effects of football skill based drill training on motor fitness and skill performance variables among college football players.
3) The third objective of the study was to discover the superiority of the effects of circuit resistance training and football skill based drill training on motor fitness and skill performance variables among college football players.
4) The fourth objective of the study was to identify the differences between the base line and post effects on selected criterion variables owing to the two different training approaches.

1.14 Hypotheses

1. It was hypothesised that circuit resistance training would significantly improve motor fitness variables namely speed, explosive power, agility, muscular endurance and cardio respiratory endurance among college football players.
2. It was hypothesised that circuit resistance training would significantly improve skill performance variables namely passing, dribbling and shooting ability among college football players.

3. It was hypothesied that football skill based drills training would significantly improve motor fitness variables namely speed, explosive power, agility, muscular endurance and cardio respiratory endurance among college football players.
4. It was hypothesised that football skill based drill training would significantly improve skill performance variables namely passing, dribbling and shooting among college football players.
5. It was hypothesised that there would not be any significant differences between circuit resistance training group and football skill based drill training group on the selected motor fitness variables namely speed, explosive power, agility, muscular endurance and cardio respiratory endurance among college football players.
6. It was also hypothesised that there would not be any significant differences between circuit resistance training group and football skill based drill training group on the selected football skill performance variables namely passing, dribbling and shooting among college football players.

1.15 Significance of The Study

1. The results of the study would be of immense significance because it would provide an opportunity to the physical educators, coaches and players to understand and assess the changes in the motor fitness and skill performance variables due to circuit resistance training and soccer drill practices.
2. The findings of the study would help the coaches, football players and physical educationists to choose and utilize a well planned effective training programme to enhance fitness and performance.

3. The college level football players would understand their status in motor fitness and skill performance variables through this investigation.
4. The results of the study would motivate the college level football players to practice the game throughout the calendar year along with the training programme.
5. The findings of the study would contribute to the quantum of knowledge in the field of training and exercise physiology.
6. This study would be useful to the budding researchers.

1.16 6 Delimitations

The present study was delimited in the following aspects

1. The study was restricted to sixty college men football player's from SRM University Chennai, India.
2. The age of the selected players were ranged from 18 to 25years.
3. The selected players were divided into three equal groups, each consisting of 20 subjects i.e., two experimental groups and one control groups.
4. The motor fitness and skill performance variables were considered as dependent variables of the present study and were delimited to speed, explosive power, agility, muscular endurance, cardio respiratory endurance, passing, dribbling and shooting ability.
5 As far as independent variables were concerned the study was delimited to two different training approaches, i.e. circuit resistance training and football skill based drill training.
6 The training period was delimited to twelve weeks for three alternative days. The data was collected prior and after twelve weeks of training program.

1.17 7 Limitations

The study was limited in the following aspects and these limitations would not be taken into consideration for deriving the result:

1. The influence of certain factors like style, daily work, diet and other factors on the result of the study were not taken into consideration.
2. No attempt was made to control the factors like air resistance, intensity of light, atmosphere and temperature during training and testing period.
3. The knowledge of the subjects in exercise, science and their previous experience in doing physical activities were not taken into consideration.
4. Since the subjects were motivated verbally during testing and training periods, no attempt was put to differentiate their level of motivation.
5. The psychological stress and other factors, which affect the metabolic function were not taken into consideration.
6. The heredity of the subjects and its influence on the selected criterion variables were not taken into consideration.

1.18 Operational Terminology

1.18.1 1 Experimental Study

Study in which the experimental variable should be randomly assigned to some subjects and not to others (controls).Results are analysed statistically to determine if the experimental variable is significantly different between experimental subjects and controls, **(Sharkey, 2010)**.

1.18.2 2 Independent variables

"Main variable is one under consideration that is manipulated by the researcher with subjects randomly assigned to various groups or testing conditions" **(Morehouse, 1975)**.

1.18.3 3 Dependent variables

"A dependent variable is that condition that is observed and measured that is expected to be affected in some way as a result of the manipulation of independent variable" **(Morehouse, 1975)**

1.18.4 Motor Fitness

Motor Fitness refers to the ability of an athlete to perform successfully at their sport. **(Davis, 2000)**

1.13.5 Speed

The capacity of an athlete to perform a motor skill as rapidly as possible **(Ratmess, 2012)**

1.18.6 6 Muscular Endurance

Ability of muscle to maintain sub maximal force levels for extended periods **(Heyward, 2010)**.

1.18.7 7 Cardio respiratory endurance

Ability of heart, lungs and circulatory system to supply oxygen to working muscles efficiently **(Heyward, 2010)**.

1.18.8 8 Agility

Ability of an athlete to change direction rapidly without a loss of speed, balance or body control **(Ratmess, 2012)**.

1.18.9 9 Repetition

A complete movement cycle including an eccentric and concentric muscle action **(Ratmess, 2012)**.

1.18.10 0 Set

Set is a specified group or number of repetitions **(Ratmess, 2012)**.

1.18.11 1 Rest interval

The amount of test taken between sets and exercise **(Ratmess, 2012)**.

1.18.12 2 Circuit resistance training

Circuit training is a form of conditioning combining resistance and high-intensity aerobics. It is designed to increase strength, muscular endurance, and cardio respiratory endurance.

1.18.13 Passing

In football passing takes place when the player in possession kicks the ball to a teammate. Passes can be long or short but must remain within the field of play.

1.18.14 4 Dribbling

Dribbling may be defined as "a controlled player movement with ball." Players highly skilled in ball control are most effective when they select to dribble wisely, i.e., they know when to dribble and when to use an alternative game strategy.

1.18.15 5 Shooting

Shooting is the action when an attacking player kicks the ball towards goal in an effort to score, a move in which a player runs with the ball at his feet past one or more defenders, usually in a twisting run.