CHAPTER I

INTRODUCTION

Improving skill means that the performance of any motor task becomes more efficient thereby reducing the time taken to complete the task and the level of effort required. This increased level of skillfulness could also mean more enjoyment and satisfaction for the performer by increasing the ease with which the task can be completed or by allowing new, more complex skills to be attempted. If by understanding the processes that govern the control of movement we can show the way for all individuals to improve their ability to perform the myriad of motor tasks that they confront, then we can claim to have made a real contribution to improving the quality of life within our society **(Kerr, R. 1982)** .

Sports in the present world has become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and psychology etcetera. All the coaches, trainers, physical educational personals and doctors are doing their best to improve the performance of the players of their country. Athlete players of all the countries are also trying hard to bring laurels, medals for their countries in International competitions.

Athletic performance has dramatically progressed over the past few years. Performance levels unimaginable before are now commonplace, and the number of athletes capable of outstanding results is increasing. One factor is that athletics is a challenging field, and intense motivation has encouraged long, hard hours of work. Also, coaching has become more sophisticated, partially from the assistance of sport specialists and scientists. A broader base of knowledge about athletes now exists, which is reflected in training methodology **(Bompa, 1999)** .

Most scientific knowledge, whether from experience or research, aims to understand and improve the effects of exercise on the body. Exercise is now the focus of sport science. Research from several sciences enriches the theory and methodology of training, which has become a branch of science. The athlete is the subject of the science of training. The athlete is the subject of the science of training. The athlete represents a vast source of information for the coach and sport scientist.

Training is not a recent discovery. In ancient times, people systematically trained for military and Olympic endeavors. Today athletes prepare themselves for a goal through training.

Training represents a long term endeavour. Athletes are not developed overnight and a coach cannot create miracles by cutting corners through overlooking scientific and methodical theories.

1.1 Boxing

Boxing, sometimes also known as Irish boxing or pugilism, is a combat sport in which two participants, generally of similar weight, fight each other with their fists. Boxing is supervised by a referee and is typically engaged in during a series of one to three-minute intervals called rounds. Victory is achieved if the opponent is knocked down and unable to get up before the referee counts to ten seconds (a Knockout, or KO) or if the opponent is deemed too injured to continue (a Technical Knockout, or TKO). If there is no stoppage of the fight before an agreed number of rounds, a winner is determined either by the referee's decision or by judges' scorecards. **(Ruben, 2000)**

Although fighting with fists comes naturally to people, the ancient Greeks provide us our first historical records of boxing as a sport; they codified a set of rules and staged tournaments with professionals. The birth hour of boxing as a sport may be its acceptance as an Olympic game as early as 688 BC. Modern boxing evolved in Europe, particularly Great Britain.

In some countries with their own fighting sports, the sport is referred to as "English Boxing" (e.g. in France to contrast with French boxing). There are numerous different styles of boxing practiced across the world.**(Rodriguez, 2009)**

1.1.1 Amateur Boxing

Amateur boxing may be found at the collegiate level, at the Olympic Games and Commonwealth Games, and in many other venues sanctioned by amateur boxing associations. Amateur boxing has a point scoring system that measures the number of clean blows landed rather than physical damage. Bouts consist of four rounds of two minutes in the Olympic and Commonwealth Games, and three rounds of two minutes in a national ABA (Amateur Boxing Association) bout, each with a one-minute interval between rounds.

Competitors wear protective headgear and gloves with a white strip across the knuckle. A punch is considered a scoring punch only when the boxers connect with the white portion of the gloves. Each punch that lands cleanly on the head or torso is awarded a point. A referee monitors the fight to ensure that competitors use only legal blows. A belt worn over the torso represents the lower limit of punches - any boxer repeatedly landing low blows (below the belt) is disqualified. Referees also ensure that the boxers don't use holding tactics to prevent the opponent from swinging. If this occurs, the referee separates the opponents and orders them to continue boxing. Repeated holding can result in a boxer being penalized or ultimately disqualified. Referees will stop the bout if a boxer is seriously injured, if one boxer is significantly dominating the other or if the score is severely imbalanced.[12] Amateur bouts which end this way may be noted as "RSC" (referee stopped contest) with notations for an outclassed opponent

(RSCO), outscored opponent (RSCOS), injury (RSCI) or head injury (RSCH).(Rodriguez, 2009)

1.1.2 Professional Boxing

Professional bouts are usually much longer than amateur bouts, typically ranging from ten to twelve rounds, though four round fights are common for less experienced fighters or club fighters. There are also some two[13] and three rounds professional bouts[14], especially in Australia. Through the early twentieth century, it was common for fights to have unlimited rounds, ending only when one fighter quit, benefiting high-energy fighters like Jack Dempsey. Fifteen rounds remained the internationally recognized limit for championship fights for most of the twentieth century, until the late 1980s, when championship bouts were shortened to twelve rounds to improve safety.

Headgear is not permitted in professional bouts, and boxers are generally allowed to take much more punishment before a fight is halted. At any time, however, the referee may stop the contest if he believes that one participant cannot defend himself due to injury. In that case, the other participant is awarded a technical knockout win. A technical knockout would also be awarded if a fighter lands a punch that opens a cut on the opponent, and the opponent is later deemed not fit to continue by a doctor because of the cut. For this reason, fighters often employ cutmen, whose job is to treat cuts between rounds so that the boxer is able

to continue despite the cut. If a boxer simply quits fighting, or if his corner stops the fight, then the winning boxer is also awarded a technical knockout victory. In contrast with amateur boxing, professional male boxers have to be bare chested.(Rodriguez, 2009)

1.1 SPORTS TRAINING

Training is a programme of exercise designed to improve the skills and to increase the energy capacity of an athlete for a particular event, therefore training is essential for the development of physical fitness components **(William and Sperryn, 1976)** .

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

The word training has been a 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 year. The term “training” is widely used in sports. There is however some disagreements among sports coaches and also sports scientists regarding the exact meaning of the word. Some experts, especially belonging for sports medicine understood sports training as basically doing physical exercise, several terms used in training for example, strength training, interval training, bench step training, technical training and statistical training reflect the line of thinking.

The Basic training procedures will serve better when utilized with modification suited to individuals or a group dealt with. The training programme should look into improving the performance of the athletes and at the same time should prevent injury from taking place (Fox, 1984) .

Training means a systematic scientific programme of conditioning exercise and physical activities designed to improve the physical fitness and skills of the players or athletics participated. Training means preparing for something for an event or reason of athletic competition, a nursing carrier or operative performance of military combat, much growth and change occur during training.

Training involves periodic assessment of the athlete's status and progress. Training usually varies regular increase in the difficulty of task performance. Training suggest some form of gradual increase in performance output over an extended period of time. Most kind of training needs regular repeated and collective repetition of some of the original movement. Any invariable training implies hard work. Training should result in a level of personal fitness and should be associated with good health.

1.2 METHODS OF TRAINING

There are different methods of specific training programmes available for the development of speed, muscular strength level, endurance and cardio respiratory endurance to their maximum. Training methods includes weight

training, interval training, fartlek training, circuit training, isotonic training, isometric training, isokinetic training. But before giving training the coaches or physical education teachers should have clear understanding of the method of training to be given to the sports men concerning. The basic scientific principles and guide lines for constructing an effective conditioning programme. Since there are specific principles and guidelines that must be and bored to in order for optimal training adaptation to take place. Training programme should be designed to suit the specific energy sources needed for athletics, specific event or contest. Moreover it is generally agreed among coaches and exercise physiologist that every body does not respond to training in the same manner. There are certain anatomical (trunk, shoulder, pelvis, chest, abdomen, upper and lower extremities) and physiological (blood volume, blood pressure, heart rate, cardiac output and vital capacity). Sex difference which favour both male and female for specific activities, coaches and physical education teacher should also have an idea of factors influencing in the pre adolescent an adolescent period during the training period.(Hardayal Singh, 1984)

Physical activity causes beneficial changes in the functioning of all internal organs, particularly, the heart, lungs and circulatory system. Studies has proved that exercise is the cheapest preventive medicine and after a period of training there is a slow but consistent reduction in resting heart rate along with an

increase in stroke volume. It is a known fact that the slower heart rate and increased stroke volume provide a greater rest for the heart between beats.

1.3 EFFECTS OF TRAINING

Vigorous training, the blood circulation quickness, blood and lymph stream through the muscle, supply the cells with oxygen and nutrition removing waste products. The heart activity is accelerated exercise and strengthening its own fibers. Exercise also stimulates growth, and strengthens the bones, muscles, ligaments and tendons (Hardayal Singh, 1984) .

The training process acts as a means of improvement of sports performance. In order to ensure fast development in every individual the physical education teachers, the coaches and the instructors must possess a thorough knowledge of the improvement aspect of sports training (Hardayal Singh, 1984)

Training demands correct understanding and realization of the sportsman's strength, capacity and weakness, so planned and formulated that the strong points are further encouraged and developed and his weakness are discriminated and eliminated. Training improves the functions 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. Different training methods have been commonly used to improve physical fitness and its related standards of performance of the players.

Training increases the overall efficiency of the heart contraction and becomes more forceful. The diastolic phase increase and the reservoir capacities are enlarged.

CONTINUOUS TRAINING

Continuous training is a type of physical activity that involves activity without rest intervals. The type of training may be of high intensity or moderate intensity with an extended duration and improves maximum oxygen up take (VO_{2max}). The intensity exercising in continuous training is related to internal body changes and two statements should be taken into account (Hansen, 2009)

IMPORTANTANCE OF CONTINUOUS TRAINING

Higher endurance can be achieved by if HR raises more than 50% of HR reserve during exercise.

The most effective increase of endurance will be achieved if HR reserve increases and remain in target Zone i.e., 70-80%. HR reserve during exercise.

Continuous training is when an athlete's exercise in a steady aerobic way without any pauses or breaks in between. Continuous training can be broken down into the following subdivisions which have slightly effect upon the energy pathways.(Hansen, 2009)

Running at 50-60% of max heart rate (20-36% of VO_2max) with very easy pace which can metabolizes fat. The nature of activity should be aerobic and the duration should be above 6 minutes. Is useful for joggers and long distance runners.

Running at 60-70% of max.Heart rate (36-62% of $VO_{2\ max}$) with slightly faster pace. The type activity should be aerobic and which will burn glycogen and fat for duration of 45-90 minutes. This will improve cardiovascular system and capillarization (Hansen, 2009)

INTERVAL TRAINING

In 1956 Olympic games at Melbourne, four athletes created a new Olympic record in 8000M and nine athletes in 1500M race. This record breaking effort in middle distance and many other events has been the recent trend in Olympics and World championships is the scientific training method which was then and is now being adopted as “interval training” specific to each sport / event.

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

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

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

Interval training is a series of repeated bouts of exercise alternated with period of lighter work or rest. (Gray Kumar, 2002)

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

The training schedule for one year can be divided into three major components - pre competition season, competition season and off season. In off season and pre-competition seasons the coach should concentrate more on the aerobic endurance and so the repetition of exercise will be more and the time interval will be lesser. In competition season the repetition of exercise will be very less and the interval will be maximum with 90% training intensity. The relief interval training usually is expressed in relation to the work interval. It is a work relief ratio and is expressed at 1:½ , 1:1, 1:2 and 1:3. Thus 1:½ implies that the relief interval is half the time of the work; 1:1 indicates the relief and work intervals are the same and so on (Fox and Mathews 1974).

FITNESS

Fitness is that state which characterizes the degree to which the person is able to function. Fitness is an individual matter. It implies the ability of each person to live most effectively with his potential. Ability to function depends upon the physical, mental, emotional, social and spiritual components of fitness, all of which is related to each other and mutually interdependent (Walter, 1969)

IMPORTANTANCE OF FITNESS

One of the most important benefits of fitness is that actually less a person's risk of developing or dying from many of the most common serious illnesses. The risk of developing colon cancer, heart disease, high blood pressure, or diabetes is reduced through regular activity of fitness. Being physically active has also been proved to help build health bones, joints, and muscles. Furthermore, regular physical activity reduces the overall risk of dying prematurely from any cause.(Walter, 1969)

PHYSICAL FITNESS

The physical fitness has an important and most valuable place in modern society for its close relation to every stage of life. Physical fitness can be achieved through the coordination of all the aspects like mental, social, environmental and emotional condition. When people are physically fit they look better, feel better,

sleep better, think more clearly and resist disease and tension more easily **(Walter, 1969).**

Each type of training produces has its own effect on fitness. Training effect describes the physical changes that occur from regular participation in a fitness programme. These basic training procedures will serve better when utilized with modification suited to the individual on a group dealt with. The best training programme is that which increase the desired quality at a higher rate without causing unwanted effects. The individuals physical and motor fitness qualities in which a definite improvement can be achieved through appropriate training **(Bompa, 1999)**

IMPORTANT OF PHYSICAL FITNESS

In modern society, life has become complex due to various reasons. The modern way of life has lowered people's biological fitness levels. People lead sedentary lives, as machines have made their life easy and comfortable. Without adequate physical exertion man has become a storehouse of unreleased tension. Modern man in the electronic and computer age tends to become complacent and forgets the need of physical training for his survival. Modern man, due to his luxurious, easy and comfortable life, has become an easy prey to various fatal diseases. (Hardayal Singh, 1991)

One of the most beautiful and valuable things that God has created on earth is human life. It is the responsibility of humans to protect and maintain human life in order to achieve higher goals and objectives and live a happy and meaningful life. This can be made possible by paying due attention health and fitness. So scientists, researchers and health experts have developed their precious time to the fields of health and physical fitness.

PHYSICAL VARIABLES

SPEED

Speed is an ability to perform a movement or cover a distance in a short time (Lawrence and Gross, 1972)

IMPORTANTANCE OF SPEED IN SPORTS

Speed is one of the main fitness components, important for success in many sports. For some athletes such as Track and Field sprinters, sprint swimmers, cyclists and speed skaters, speed is the most important aspect of fitness. See also another list ranking sports in which speed is important (Lawrence and Gross, 1972)

AGILITY

Agility is the ability to move and change direction and position of the body quickly and effectively while under control **(Dick, 1992)** .

IMPORTANTANCE OF AGILITYIN SPORTS

Agility helps performance in activities that require you to change direction quickly while keeping balance, strength, speed and body control. Agility is not just about the speed with which an individual can change direction. But it's also defined by the grace and fluidity of movement **(Dick, 1992)**

FLEXIBILITY

A person's flexibility refers to the ability of his joints to move through a full range of motion.(**Dick, 1992)**

IMPORTANT OF FLEXIBLITY IN SPORTS

This is an excellent time for flexibility training because the muscles are warm and pliable, allowing them to stretch farther Reduces the risk of injury during exercise and daily activities because muscles are more pliable. Improves performance of everyday activities as well as performance in exercise and sport (**Dick, 1992)**

MUSCULAR STRENGTH

Muscular Strength is the ability to overcome resistance or to act against resistance. **(Singh, 1991)**. Muscular Strength is the maximum amount of force that can be generated during one maximal contraction of a single muscle group**.**

IMPORTANT OF MUSCULAR STRENGTH

The Importance of Muscular Strength in Athletic Performance Much research supports the motion that greater muscular strength can enhance the ability to perform general sport skills such as jumping, sprinting, and change of direction tasks **(Singh, 1991)**.

PHYSIOLOGY

Physiologies, fitness which may be termed as training effect is achieved

through exercise or activates that promote the use of oxygen to burn fuel in working muscles. The components of physical fitness are strength, cardiovascular endurance, speed, agility, power, flexibility, balance and coordination**.** According to Fox and Mathews **(**1985) during competitive soccer match play, elite players cover a distance of about 10–12 km. According to at an average intensity close to the anaerobic threshold, being 80–90% of maximal heart frequency (Hfmax) or 70–80% of maximal oxygen uptake **(Vo_2max).**

IMPORTANTANCE OF PHYSIOLOGY IN SPORTS

It is estimated that aerobic metabolism provides 90% of the energy cost of boxing match play. Therefore, it is a prerequisite in the modern game for the elite boxing player to have high aerobic endurance fitness. Although each of these sports has its own distinctive skills, tactics and movement patterns, they all have similar physiological demands such as high aerobicpower, high lactate tolerance and increased anaerobic capacity (**Fox and Mathews (1985)**. These physiological capacities allow the team-sport player to repeat sprints often with quite short recovery periods over a prolonged duration. This type of activity is commonly referred to as Prolonged High-Intensity Intermittent Exercise.

EXERCISE PHYSIOLOGY

Exercise physiology is the scientific study of physiological changes in athletes body with the effects of exercise, whether long term or short term. Differentenvironmental changes, namely, altitude, climate, temperature, humidity, nutritional status etc have some close associations with the optimal performance of an athlete.**(Fox and Mathews (1985).**

IMPORTANTANCE OF EXERCISE PHYSIOLOGY

For the physiological systems of the body to be fit, they must function well enough to support the scientific activity that the individual is performing

moreover different activity make different demands upon the organism with respect to the circulatory, respiratory metabolic and neurologic processes which are specific to the activity. Attributes have created a superlative human form for distance runningThepeople who live near the Baltic Sea in northeast Europe, including Lithuanians and Russians, possess tall, lean, muscular frames, ideally suited to sports such as basketball. These two examples are based on a broad range of experience and athletic success that these groups have enjoyed in the stated sports. (**ShaverLarry.G. 1982)**

PHYSIOLOGICAL VARIABLES

RESTING PULSE RATE

Resting pulse rate which is the number of beats felt exactly one minute. The average rate of the pulse in a healthy adult is 72 beats in each minute. There may be variation of upto five beats per minute within the normal range. The number of beats of a pulse per minutes or the number of the beats per minutes in the heart beats count.**(Moses,1995).**

IMPORTANTANCE OF RESTING PULSE RATE

The pulse rate or heart rate varies greatly among different people and in the same person under different situations. The American Heart Rate Association accepts as normal range from 50 to 100 beats per minute. The average rate is 72

beats per minute but the rate can accelerate to 220 per minute. The lesser pulse rate given good performance for all the sports and games.**(P.J.Strukic, 1981)**

VITAL CAPACITY

The volume of air that can be moved out of the lungs after maximum inspiration is called vital capacity. **(P.J.Strukic, 1981).**

IMPORTANTANCE OF VITAL CAPACITY

The maximal volume of air that can be forcefully exhaled from the lungs following a maximal expiration **(P.J.Strukic, 1981).**

VO2 MAX

The maximum amount of oxygen the body can use during a specified period of usually intense exercise that depends on body weight and the strength of the lungs is called also maximal oxygen consumption, maximal oxygen uptake, max VO_2. **(Shaver, Larry G 1982)**

IMPORTANTANCE OF VO2 MAX

This is measured by how much oxygen (in milliliters) your body can use per kilogram of body weight per minute. Learn more about the body's energy systems. VO2 max is the maximum amount of oxygen the body can use, and it directly correlates to fitness capacity **(Shaver, Larry G 1982)**.

BIOCHEMICAL VARIABLES

Biochemical is the study of the chemical substances and vital processes occurring in living organisms. Biochemists focus heavily on the role, function, and structure of biomolecules. The study of the chemistry behind biological processes and the synthesis of biologically active molecules are barrow from biochemistry.

IMPORTANTANCE OF BIO CHEMICALVARIABLES

In the importance of biochemistry is so vast that it is indispensable in our daily life activities. It is used in clinical diagnosis, manufacture of various biological products, treatment of diseases, in nutrition, agriculture, etc. The study of biochemical helps one understand the actual chemical concepts of human biology and the animal biology.

HIGH DENSITY LIPOPROTEINS

A class of lipoproteins of relatively high density of the main function .which is to transport cholesterol from the tissues to the liver for excretion for human body**(P.J.Strukic, 1981).**

IMPORTANTANCE OF HIGH DENSITY LIPOPROTEINS

HDL cholesterol is the well-behaved "good cholesterol." This friendly scavenger cruises the bloodstream. As it does, it removes harmful bad cholesterol from where it doesn't belong. High HDL levels reduce the risk for heart disease -- but low levels increase the risk**(P.J.Strukic, 1981).**

LOW DENSITY LIPOPROTEINS

A class of lipoproteins to relatively low density of the main functions.This to transport cholesterol to the tissues for human systems **(P.J.Strukic, 1981).**

IMPORTANTANCE OF LOW DENSITY LIPOPROTEINS

The most commonly used measure of cholesterol is arguably 'total cholesterol', a measure that includes LDL cholesterol and HDL cholesterol. However, given This highlights the importance of interventions aimed at reducing serum cholesterol levels **(P.J.Strukic, 1981).**

REASON FOR SELECTION OF THE TOPIC

Basically the researches among boxers are rare. It was felt by the investigator that the studies on a effect of continuous training and interval training on selected physical physiological and Biochemical variables among college level boxers in Tamil Nadu has a great impact on sports. Hence conducting a research

study to compare the Physiological variables among college level players of Tamil Nadu State, on the effect of continuous training and interval training.

Physical factors play an important role for best performance. In Individual boxing players of Tamil Nadu state for achieving high level performance which is the study area and it requires to be physically fit in the competitive situation. Among the many other bio chemical variables the researcher selected to prove how far the chosen variables getting changes through the selected experimental treatments.

1.10 OBJECTIVES OF THE STUDY

Coaching and training for young athletes' is very interesting but at the same time it must be based on some standard procedures and specific scientific principles should be followed. There are different types of training methods for the development of physical, physiological and biochemical abilities of athletes. Understanding these training methods and the effectiveness of the training methods to suit a particular event is a challenging task for any coach or player. This helps coaches and athletes prevent injury and overtraining while trying to maximize their physical ability, and analyze the strengths and weaknesses related to their specific training programs. If one failed to establish correct training patterns for young athletes, unfortunately, goes way back. Hence the investigator

was interested to find out the effects of continous training and interval on selected physical, physiological and biochemical variables among college level boxers.

Thus, the objective of this research is to assess the physical variables, namely, speed, agility, flexibility, muscular strength, endurance, physiological variables, resting pulse rate, vital capacity, VO2 max and biochemical variables, low density lipoprotein and high density lipoprotein. Of college level boxers. The effect of continuous training and interval training on each of the variables selected with control group to determine whether these training produce significant changes in selected variables. Under these interventional situations, (a) which of the training method is better than the other one? (b) and to which extent ? were the current research focuses on the effects of continuous training and interval training on selected criterion variables among college level boxers. .

STATEMENT OF THE PROBLEM

The purpose of the study is to find out the effect of continuous training and interval training on selected physical physiological and Biochemical variables among college level boxers.

SIGNIFICANCE OF THE STUDY

The following were considered as significance of this study:

i. The study will help us to assess the selected physical, physiological and biochemical variables among college level boxers in Tamil Nadu.

ii. The result of the study will help us to compare selected physical, physiological and biochemical variables among college level boxers in Tamil Nadu.

iii. The result of the study motivates the boxer men in TamilNadu to participate in various sports and games, to develope sportsman ship among students.

iv. The study will help to know the effects of continuous training and interval training on selected physical, physiological and Biochemical variables among college level boxers in Tamil Nadu.

HYPOTHESES

1. It was hypothesized that 12 weeks continuous training and interval training would significantly alter physical variables, speed, agility, flexibility and muscular strength of college level boxers compared to control group.

2. It was hypothesized that 12 weeks continuous training and interval training would significantly alter physiological variables, resting pulse rate, vital capacity and VO2 max of college level boxers compared to control group.

3. It was hypothesized that 12 weeks continuous training and interval training would significantly alter biochemical variables, low density lipoprotein, and high density lipoprotein of college level boxers compared to control group.
4. It was hypothesized that there would not be any significant difference between continuous training and interval training on selected physical, physiological and biochemical variables among college level boxers.

DELIMITATIONS

1. To achieve the purpose of the study 90 college level men boxers has been taken as subjects from the various college of engineering at Thiruvanamalai District in Tamil Nadu.
2. Their age ranged from 18 to 25 years.
3. The study is restricted only college level men Boxers.
4. The study is confined the following variables such as Physical, Physiological and Biochemical variables.

5. To achieve the purpose of the study Continuous and Internal training has been given and fixed 12 weeks training program.
6. The Training schedule should be Three days per week.
7. The following suitable variable has been taken for this study.

Physical Variables

Speed

Agility

Muscular Strength

Flexibility

Physiological variables

Resting pulse rate

Vital capacity

VO2 max

B**iochemical variables**

High Density lipoprotein

Low Density lipoprotein

LIMITATIONS

Day to day activities, rest periods, food habit and life style will not be controlled.

Hereditary and environmental factor, which contributed to both physical and mental efficiency, will not be controlled.

No motivation will be used during various stages of training and testing periods.

The experiment will be conducted only on college level boxers in Tamil Nadu.

The age of the subject selected only between should be 18 to 25 years.

DEFINITION AND TERMS

TRAINING

The dictionary meaning of training is that "It is a process of learning the skills you need to do a particular job or activity", or it is a repetition of particular movement. According to Hardayal Singh, (1991) Training is a programme of exercise designed to improve the skills and to increase the energy capacity of an athlete for a particular event, therefore training is essential for the development of physical fitness components. Based upon the specific requirements the training could be prepared by the expert to attain the fitness level.

AGILITY

Agility is the ability to change directions quickly and control body movement. **(Hardayal Singh 1991)**

SPEED

Barrow and McGee (1976) define speed as The capacity of inaugural to platform successive movement of the same pattern at the first rate **(Hardal Singh 1991) .**

FLEXIBILITY

Flexibility can be defined as the ability to execute movements with greater amplitude or range. Flexibility is measured to be determining the range of movement around muscle joint. **(Barry L.Johnson and Jack K Nelson1996)**

MUSCULAR STRENGTH

The power of being strong and the capacity of all individual are so strong. **(Barry L.Johnson and Jack K Nelson1996)**

RESTING PULSE RATE

The total number of heart beats in one minute on a relaxed comfortable position is called resting pulse rate **(Shaver1982).**

VITAL CAPACITY

It is the greatest volume of air that can be expelled from the lungs after taking deepest possible breath **(Shaver, 1982).**

VO2 MAX

VO2 max is the maximum volume of oxygen O2 in milliliters that one can use in one minute per kilogram of body weight .While breathing air at sea level Oxygen Consumption happens to be linearly related to energy expenditure. Therefore, When we measure Oxygen Consumption we are indirectly measuring an individuals maximal capacity to do work aerobically. **(Shaver, 1982)08**