

CHAPTER I

INTRODUCTION

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 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.

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.

Training means a systematic scientific programme of conditioning exercise and physical activities designed to improve the physical fitness and skills of the players or athletes 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 (Hardayal Singh 1991).

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.

1.1 PHYSICAL FITNESS TRAINING

Fitness is a key to enjoy life. Exercise is an important of a total fitness programme. Modern living has taken all the exercise out of our lives and so in order to get fit and have to put it back again, regular exercise is necessary to develop and maintain an optional level of health, performance and appearance. It makes feel good, both physically and mentally. It gives psychological lift and strengthens a sense of accomplishment. Looking young is a reflection of good health. Regular physical exercise enhance the function of the joints; increase the sense of physical well-being and promotes a sense of feeling good; increases physical working capacity by increasing cardiorespiratory fitness, muscle strength and endurance and decreases the risk of serious diseases that could lead to early disability and death (Hardayal Singh 1991).

Ukoho (1988) expressed that exercise has shown to improve health prospects in various ways. It helps to reduce body fat and overall weight and reduce blood pressure. Exercise ensures better digestion, respiration and efficient blood circulation. Proper exercise programme can reduce the probability of injuries among older people as well as back injuries among certain occupational group. Exercise tolerance is increased, risk factors are controlled and even progression and regression of coronary artery disease can be influenced by training and diet. Psychological effects include lessened depression and reduced anxiety. Regular physical activity is important for maintenance of health and may lead to a better quality of life. Training has to

be followed not less than two to three hours per week in at least three sessions at an intensity corresponding to 60 to 85% of maximum heart rate achieved in a symptom limited maximum exercise test. Cardiac patients at high risk should exercise at lower intensities. Exercise occupies a leading role in keeping persons fit. It will be quite difficult to adjust one's life in term of stress, diet sleep and so on without proper exercise. Exercise means using and tuning the body. Exercise builds and maintains physical fitness (Niederhauser 1996).

1.2 IMPORTANCE OF PHYSICAL FITNESS TRAINING

Every individual must know the need of physical exercise. In other words one must have fundamental knowledge of Anatomy and Physiology. This fundamental knowledge enables a person to understand physical fitness. Physical fitness is the capacity of a person to function steadily and smoothly when a situation arises.

Physical exercises makes one mentally sharpen, physically comfortable and ease with his body and better able to cope with the demands that everyday life makes upon him.

Increased physical fitness not only improves health but improves performance at work. Hundreds of American companies have backed this idea financially by employing full time directors of fitness for their work.

Physical exercise help a man to possess a high degree of physical conditions. In school there is compulsory activities programme for all girls and boys. So it would be interesting to find out which of the components have better physical fitness.

There are different methods of specific training programmes available for the development of speed, muscular strength, endurance and cardio respiratory endurance to their maximum. Training methods include weight training, interval training and fartlek training, circuit training, isotonic training, isometric training, and 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 concerned. There are specific principles and guidelines that must be taken into consideration 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) factors which differ from different training. Sex difference which favour both male and female for specific activities, coaches and physical education teachers should also have an idea of factors influencing in the pre adolescent and adolescent period during the training period.

Physical activity causes beneficial changes in the functioning of all internal organs, particularly, the heart, lungs and circulatory system. Studies had 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 (Niederhauser 1996).

1.3 EFFECTS OF TRAINING

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 (Walter 1969).

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.

Zatsiorsky and Kraemer (2006) agreed that the physiological and biochemical changes associated with training occur at about two percent of the individuals maximal aerobic capacity where as intensity less than 60 percent are not nearly sufficient. They have also warned adults exceeding 90 percent of their maximal aerobic capacity even during peak exercise effort. They recommend 60 percent and 80 percent of their maximal capacity for state effective training. These levels can be estimated by using heart rate as guidelines.

1.4 INTENSITY OF TRAINING

Different activities can be carried out with different intensities which may have different effect in organism. According to Noble et al (2002) exercise intensity is determined by adding 4 seconds to the average race pace speed. This is maximal times manipulation of exercise and rest time has a sufficient effect on the intensity of the training stimulus.

The proper intensity of training can be determined by trial and error. If an exercise bout results in a heart rate that is below the training heart rate increase the speed or intensity of the next bout and if the heart rate is above the training heart rate decrease the intensity of the next bout. One of the great

advantages of this type of program is that it allows exercise in many varied and different conditions with minimal changes. The heart rate will accurately reflect the stress level on the body and allow an adult to exercise safely in the heat or at altitude. The speed of the activity may decrease but the training effect will be same. The principle works on the other way too. As the cardiovascular system becomes more efficient, work will become easier and the tempo of the activity will necessarily increase to maintain the training heart rate.

Exercise intensity should be checked frequently at the beginning and during the exercise programme. This requires some practice in taking one's pulse usually in the radial or carotid artery locations, since it is rather difficult to calculate the pulse during exercise. The pulse should be taken for a period of ten seconds immediately after stopping, beginning the count with zero. If the rate is below the prescribed training range, the intensity should be increased and if the rate is above the range, the intensity should be reduced.

For cardiovascular conditioning to take place the intensity should exceed approximately 50 percent at 60 percent of functional capacity (VO_2) and for safety and comfort and may exceed to 75 percent to 80 percent. This usually translates to a heart rate training range of 70 percent to 80 percent of maximal heart rate.

Maximal heart rate can be estimated to be $220 - \text{Age}$ (Karvnon Method) beats per minute for healthy individuals under age 20. Under age 45 with no

coronary risk factors, endurance – training also tends to show somewhere around 185 to 190 beats per minute. It tends to lower the resting heart rate. In highly trained athletes, it may be as low as or lower than 40 to 45 beats per minute, on the other hand, in healthy but untrained subjects, resting heart rates may be as high as 90 to 100 beats per minute. Thus the trained subject is generally characterized as having a lower resting heart rate and the untrained as a high resting heart rate. The highest attainable heart rate during performance of strenuous work not only depends upon the state of conditioning but also upon age.

For cardiovascular conditioning to take place the intensity should exceed approximately 50 percent of functional capacity (VO_2) and for safety and comfort not to exceed 75 percent to percent. This usually translates to a heart rate training range of 70 percent to 80 percent of maximal heart rate.

The intensity and length of the work interval should be based upon the primary energy system being used in the activity. Sprinters should have short high intensity intervals whereas marathons may run intervals of 3 miles at race pace or slower. It should be pointed out that the rest interval is really not a time to stop all activity but only a jog or walk period which allows the body to recover somewhat before the next interval begin.

At the age of 20 the maximal heart rate is about 200 which is reduced to approximately 155 at the age of 70. The exact mechanism involved in this age reduced maximal heart rate is not fully understood. It is also pointed out

that the type of exercise also definitely influences the increase in heart rate. For example the greatest acceleration of the heart occurs in exercises of speed such as sprint running where as the smallest increase takes place in exercise of strength such as weight lifting and throwing in exercise that are classified as endurance such as distance running. The heart rate is some where between those of speed and strength exercise at the same time, however heart rate recovery take longer following cessation of the endurance exercise.

There are several factors that affect the resulting heart rate besides exercise and training. Although the extent of variation differs with each individual body position has a definite effect upon the heart rate. Generally the rate is lowest in the recumbent followed by the sitting and standing. It appears that the typical response from the recumbent to the standing position is an increase around 10 to 12 beats per minute. This is done to the influence of the gravity which lowers the volume of blood returning to the heart. One goes from a reclining position to a sitting or standing position individuals who are physically fit show a similar increase between lying and standing than sedentary individuals.

1.5 STRUCTURE OF PHYSICAL FITNESS TRAINING

The following principles are used for establishing the structure of the exercise test.

1. The test duration should exceed 6 minutes but not longer than approximately 15 minutes.
2. The test protocol should incorporate a warm up period.
3. The initial exercise intensity should be at a level below the estimated point of impairment in the case of a patient and below the estimated maximal capacity in other cases.
4. The test should involve variable loads instead of single continuous protocol. The technique allows observation of an individual within a variety of exercise intensities, representing the possible daily range of physical activities.
5. The tests protocol should be arranged in stages with each stage progressively increasing in intensity until the termination criteria is reached. The staged duration should ensure attainment of steady state conditions for heart rate and oxygen consumption duration between 3 minutes to 6 minutes to meet this requirement.

The training effect of exercise depends upon the amount of stress imposed upon the relevant part of the body. There are variation in the resting heart rate response that is used in the exercise gives a better indication of intensity.

Physiological changes ranging from training are generally related to the intensity of the exercise. Intensity is expressed in terms of efforts relative

to the subject control capacity. The enhancement of capacity is greater when load of 90 to 100% of the individual capacity are imposed. Maximal loads are potentially injures and painful and re utilized mainly by athletes in their final training for championship performance.

Significant training changes occur at levels of intensity as low as 25% of maximal cardiovascular function of middle aged men improved identically at the intensity of the individuals. Maximum heart rate equal to 0 to 87% of his maximal oxygen uptake (Anthony 1972).

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 becomes more forceful. The diastolic phase increase and the reservoir capacities are enlarged.

1.6 PSYCHOLOGY

The term 'psychology' is derived from two Greek words 'psyche' and 'logos', wherein psyche means the soul or mind, and the, meaning of logos is to talk about, or science or study. Thus, the literal meaning of psychology is the science or study of soul. Greek philosophers believed that soul was responsible for various mental activities such as learning, thinking, feeling etc. It was believed that soul was the essence or true being of an organism, the cause and the principles of life. As the relation of soul to the body and the functions of soul could not be explained, some philosophers tried to define psychology as a science of mind (Ajmer Singh 2006).

Later, psychology was defined as the 'science of human consciousness'. But the definition was not acceptable to the modern psychologists because it ignores the unconscious state of man which is also very important and limits the study of psychology to only conscious state of man.

The commonly accepted modern conception of psychology is that 'psychology is the science of human behaviour'.

The word psychology refers to the study of human behaviour, and sports psychology denotes a sub category of psychology that deals with the behaviour of athletes and teams engaged in competitive sports. According to Browne and Mahony (2001) 'Sports psychology' is a application of

psychological principles of sports and physical activity at all levels of skill improvement (Ajmer Singh 2006).

Psychology of sports means applying psychological theories and concepts to aspects of sports such as coaching and training. Sports psychology is concerned with analyzing human behaviour in various types of performance.

Psychology as a behavioural science has made its contribution for improving sports performance. It has helped coaches to coach more efficient and athletes to perform aspects on sports more proficiently. This psychology a rapidly growing area of interest is gaining much attention among administrators. A rapidly growing area of interest in sports psychology concerns the use of stress management, produces such as bio-feed back and relaxation training to enhance athletes performance by reducing stress (Bucher and Wast 1988).

Different psychic abilities play decisive role to performance in track and field athletes winning in international sports competitions.

Role of psychology in selection, training materials and rehabilitation would definitely help in achieving sports excellence. The emphasis has been laid on pointing out the psychology and sports coverage at the same point and excellence in sports can be optimally obtained by developing appropriate strategies (Jastwers, Tiger, Khan and Saini 1986).

1.7 PSYCHOTONIC TRAINING

Tracing the primitive culture of mankind, it is quite evident that sports were needed as a source of physical fitness, recreation and as a medium of social well-being. But during the last few decades, the concept of sports performance has taken a drastic turn “win at all costs”. More and more scientific means are being applied all over the world, not only to win medals but also to test human efficiency (Mohan 2005).

The objective of the offense in a game of basketball is to find score against the opposing team. Most players recognize this; but, only the better players learn how to practice correctly and work at improvement year round. The player must understand the proper mechanics that affect the success or failure of every shot. Every player must know his range and know what a good shot is. Therefore, before examining the techniques associated with the various offensive or defensive techniques, a good player is expected to have in his arsenal, the mental aspect and the physical aspect of the player.

Psychological conditioning is the most critical to improve overall playing ability in a game. Knowing when to shoot and being able to do it effectively under pressure distinguishes the great shooter from the ordinary. Regardless of how much the player practices or how well the player conditions himself, only a modest amount of improvement is possible in speed, reflexes, or strength. History gives many examples of players able to achieve greatness

despite mediocre physical talent. Usually, however, such successes are due to determination (Mohan 2005).

Concentration is the fixing of attention on the job at hand and is characteristic of every great athlete. Through continuous practice, good shooters develop their concentration to the extent that they are oblivious to every distraction. Ability to relax is closely related to concentration. We often hear great shooters have concentration so intense, that he/she is undisturbed by the crowd or game pressures.

Confidence is a "gut certainty" that the ball will drop through the basket without touching the metal ring. A good shooter never takes a shot that he/she is not confident he/she will make, they often miss. Therefore, the probability of making any given shot is somewhat less than 100% that his/her confidence leads one to expect. Clearly, then, when we say, "Don't shoot when in doubt," we have something different in mind than we do when we say, "Don't take a low-percentage shot except in desperate circumstances." There are reasons why a player might lack confidence when confronted with a shooting opportunity having a good statistical probability of success. He may be off balance. He may have had his confidence shaken by a string of misses; or he may be overly tensed, or tired, or may have a lapse in concentration.

Every player experiences off nights when nothing works. An equally familiar phenomenon is a player's returning to peak form in the second half

after a miserable first half. This ability to make a mental recovery is like the ability some players have of recovering in mid-air after an off-balance take-off.

The following are the descriptions of some of the psycho-tonic training popularly used.

1.7.1 MEDITATION

Meditation is one of the five principles of yoga. It is an important tool to achieve mental clarity and health. An overview of the different basic and advanced meditation techniques helps in choosing the right meditation exercise for the subject. Meditation helps us to get more concentration and psycho physiological development.

There are many thousands of meditation methods known today. Some are best for beginners; others are better tackled after a few years of experience. When the subject's mind focuses on a particular part of their body, the blood flow to that part increases and cells receive more oxygen and other nutrients in abundance.

Many religious groups as well as adherents of transcendental meditation, talk of using a sound, or "mantra", to help with meditation. The constant repetition of a phrase, word or sound ("Aum") commonly used in Hinduism creates the alpha state by an almost hypnotic focus of attention upon that particular sound. In fact chant repeated again and again can lead the trainees in the state of higher consciousness.

Meditation benefits people with or without acute medical illness or stress. People who meditate regularly have been shown to feel less anxiety and depression. They also report that they experience more enjoyment and appreciation of life and that their relationships with others are improved. Meditation produces a state of deep relaxation and a sense of balance or equanimity. Meditation cultivates an emotional stability that allows the meditator to experience intense emotions fully while simultaneously maintaining perspective on them. Out of this experience of emotional stability, one may gain greater insight and understanding about one's thoughts, feelings, and actions. This insight in turn offers the possibility to feel more confident and in control of life. Meditation facilitates a greater sense of calmness, empathy, and acceptance of self and others.

Meditation can be used with other forms of medical treatment and is an important complementary therapy for both the treatment and prevention of many stress-related conditions. Regular meditation can reduce the number of symptoms experienced by patients with a wide range of illnesses and disorders. Based upon clinical evidence as well as theoretical understanding, meditation is considered to be one of the better therapies for panic disorder, generalized anxiety disorder, substance dependence and abuse, ulcers, colitis, chronic pain, psoriasis, and dysthymic disorder. It is considered to be a valuable adjunctive therapy for moderate hypertension (high blood pressure), prevention of cardiac arrest (heart attack), prevention of atherosclerosis (hardening of arteries), arthritis (including fibromyalgia), cancer, insomnia,

migraine, and prevention of stroke. Meditation may also be a valuable complementary therapy for allergies and asthma because of the role stress plays in these conditions. Meditative practices have been reported to improve function or reduce symptoms in patients with some neurological disorders as well (Iyengar, 2001). These include people with Parkinson's disease, people who experience fatigue with multiple sclerosis, and people with epilepsy who are resistant to standard treatment.

The vibration produced by chanting Aum in the physical universe corresponds to the original vibration that first arose at the time of creation. The sound of Aum is also called Pranava, meaning that it sustains life and runs through Prana or breath. Aum also represents the four states of the Supreme Being. The three sounds in Aum represent the waking, dream and deep sleep states and the silence which surrounds Aum represents the "Turiya" state.

The first of the three states of consciousness is the waking state; it is represented by the sound "A" pronounced like "A" in accounting. The dream state of consciousness lies between the waking and the deep sleep states; it is represented by the letter "U" which lies between the "A" and "M". This "U" is pronounced like the "U" in would. The last state of consciousness is the deep sleep state and is represented by "M" pronounced as in "sum." This closes the pronunciation of Aum just as deep sleep is the final stage of the mind at rest. Whenever Aum is recited in succession there is an inevitable period of silence between two successive Aums. This silence represents the "fourth state"

known as "Turiya" which is the state of perfect bliss when the individual self recognizes his identity with the supreme (Joypaul 2008).

1.7.2 TRANSCENDENTAL MEDITATION

Transcendental Meditation, or TM, is the trademarked name of a meditation technique introduced in 1958 by Maharishi Mahesh Yogi (1917-2008). The technique, practiced for twenty minutes twice a day while sitting with one's eyes closed, is said to involve neither concentration nor contemplation.

In 1955, the Indian ascetic Maharishi Mahesh Yogi (born Mahesh Prasad Varma) began teaching a meditation technique which was derived from the Vedas; he gave this method the name Transcendental Meditation.

Prior to this, Maharishi had studied with Swami Brahmananda Saraswati, serving as his secretary from 1941 until Brahmananda Saraswati's death in 1953. In 1957, Maharishi began the Spiritual Regeneration Movement in Madras, India, on the concluding day of a festival held in remembrance of his deceased teacher. In 1958 he began the first of a number of worldwide tours promoting and disseminating his technique.

In the early 1970s, Maharishi undertook to establish one TM teaching center for each million of the world's population, which at that time would have meant 3,600 TM centers throughout the world. Since 1990, Maharishi has coordinated the teaching of TM from the town of Vlodrop, the

Netherlands, through an organization he calls the Global Country of World Peace. This group reports that more than 6 million people worldwide have learned the Transcendental Meditation technique since its introduction

1.7.3 Procedure and Goal

The technique is taught to new practitioners in a standardized, seven-step procedure, comprised of two introductory lectures, a personal interview, and a two-hour instruction session given on each of four consecutive days. Instruction begins with a short puja ceremony performed by the teacher, after which the student receives a mantra, learns the technique, and begins practicing. Subsequent sessions are said to provide further clarification of correct practice, as well as more information about the technique.

The goal of long-term practice of the Transcendental Meditation technique is enlightenment, according to Maharishi (2001). He had presented a theory of enlightenment comprising seven major states of consciousness. The first three, waking, dreaming, and deep dreamless sleep, are commonly known. Transcendental Consciousness, the fourth state, is said to be experienced during the practice of the technique. Maharishi (2001) says that the practitioner eventually maintains the experience of transcendental consciousness while living everyday life. He refers to this as enlightenment and terms it the fifth state, Cosmic Consciousness. States six and seven, God Consciousness and Unity Consciousness, are further refinements of Cosmic Consciousness.

1.8 PROGRESSIVE RELAXATION

Edmund Jacobson (1938) created the progressive relaxation method. At the beginning of the 20th century, he conceived a method to relax whose goal was to achieve mental tranquility by progressively eliminating all muscular tensions. It is intended to learn to relax step by step all the different groups of muscles. Subsequently, Bernstein and Borkovec (1983) carried out an integration and systematization of this method to escape from the array of variations that had been emerging.

The final objective of this kind relaxation is to reduce the physiological symptoms of anxiety. The relaxation works on the Peripheral Nervous System (PNS) the opposite way from stress, so one can't be anxious and relaxed at the same time. It's important that you carry it out correctly and on a daily basis, until you master it and you're able to whenever and wherever you wish.

Carnwath and Miller (1984) presented a pattern in 3 stages. The first stage uses breathing, the second one is based upon progressive relaxation and the third one uses a visualization technique.

Anti stress relaxation was an adaptation from Jacobson's progressive relaxation and from Bernstein and Borkovec's methods, yet to incorporate Carnwath and Miller's breathing and visualization techniques. It is necessary to undergo a supervised training at a doctor's office, to do this relaxation

techniques accurately. Nonetheless, a modified and adjusted relaxation techniques that would fit it into this do-it-at-home version is made available.

1.9 REASONS FOR SELECTION OF THE TOPIC AND VARIABLES

A review of scientific studies identified relaxation, concentration, an altered state of awareness, a suspension of logical thought and the maintenance of a self-observing attitude as the behavioral components of meditation. It is accompanied by a host of biochemical and physical changes in the body that alter metabolism, heart rate, respiration, blood pressure and brain chemistry. Meditation has been used in clinical settings as a method of stress and pain reduction. Meditation has also been studied specifically for its effects on stress. The investigator was interested to find out the effects of isolated and combined effect of physical fitness and psycho-tonic training on selected physical, physiological and psychological variables among college men students.

1.10 STATEMENT OF THE PROBLEM

The purpose of the study was to find out the isolated and combined effect of physical fitness and psychotonic training on selected physical, physiological and psychological variables among college men students.

1.11 HYPOTHESES

It was hypothesised that:

1. There would be no significant difference among physical training group, psychotonic group, combined training group and control group on speed, agility and cardiovascular endurance.
2. There would be no significant difference among physical training group, psychotonic group, combined training group and control group on resting pulse rate, mean arterial blood pressure and vital capacity.
3. There would be no significant difference among physical training group, psychotonic group, combined training group and control group on self concept, achievement motivation and anxiety.

1.12 SIGNIFICANCE OF THE STUDY

The study is significant in the following respects

1. The study would assess selected physical fitness, physiological and psychological levels of college men.
2. The study would assess the isolated and combined effect of physical fitness and psychotonic training on selected physical, physiological and psychological variables of college men.
3. The study would assess which one, weather physical training or psychotonic training was more effective on physical, physiological and psychological variables among college men.

4. The results of this study would be helpful to physical education teachers, coaches and college men to use the right method for improving specific physical fitness, physiological and psychological variables.
5. The psychotonic training protocol developed in this study would serve as a model for future psychotonic training modules.
6. The findings of this study would add to the quantum of knowledge in the area of sports training and sports psychology.

1.13 DELIMITATIONS

1. For this study, 120 college men in the age group of 19 to 25 years was randomly selected from different colleges in Vellore.
2. The subjects were randomly assigned into four groups, namely, physical fitness training group, psychotonic group, combined group and control group consisting of 30 college men in each group.
3. The control group was not exposed to any specific training, experimental group I, II and III underwent physical fitness training, psychotonic training and combined training respectively.
4. The experimental period for the treatment was 12 weeks.
5. The following dependent and independent variables were selected for this study.

Dependent Variables**Physical Fitness Variables**

1. Speed
2. Agility
3. Cardiovascular Endurance

Physiological Variables

1. Resting Pulse Rate
2. Mean Arterial Blood Pressure
3. Vital Capacity

Psychological Variables

1. Self Concept
2. Achievement Motivation
3. Anxiety

1.14 LIMITATIONS

1. The differences in socio-economic status of the subjects which might influence the psychological balance were not taken into consideration.
2. Factors like life style, daily routine, health habits, etc. which might have fluctuating influence on the variables were also not considered.
3. Participation in the local league tournaments and local matches by the subjects could not be controlled.

4. The responses of the subjects to the statements in the questionnaire would depend upon various factors, such as understanding of the statements, seriousness and sincerity of the subject etcetera. The accuracy and reliability of the subjects' responses in the questionnaire could not therefore be assessed and was considered as one of the limitations.

1.15 DEFINITION AND EXPLANATION OF TERMS

1.15.1 Fitness Training

The training works towards broad goals of overall health and well-being, consists of different physical exercises is defined as fitness training. (Hardayal Singh 1991).

1.15.2 Psychotonic Training

Psychotonic training is any form of training or a stimulant, which has its primary effect on the brain and central nervous system. A psychotonic increases psychological tone and delays the subjective feeling of fatigue without actually improving the physical capacity of muscles (www.answers.com/topic/psychotonic).

1.15.3 Meditation

The 1913 edition of Webster's dictionary defines meditation as; the act of meditating; close or continued thought; the turning or revolving of a subject in the mind; serious contemplation; reflection; musing.

“Meditation is a systematic way of making our mind quiet so that we can contact our true identity-self, which is the source of everlasting joy, bliss and peace” (Iyengar 2001).

1.15.4 Transcendental Meditation

Transcendental Meditation, or TM, is the trademarked name of a meditation technique introduced in 1958 by Maharishi Mahesh Yogi (1917-2008). The technique, practiced for twenty minutes twice a day while sitting with one's eyes closed, is said to involve neither concentration nor contemplation.

1.15.5 Progressive Relaxation Technique

Progressive muscle relaxation is a technique of stress management developed by American physician Edmund Jacobson (1897-1980). Jacobson argued that since muscular tension accompanies anxiety, one can reduce anxiety by learning how to relax the muscular tension.

1.15.6 Speed

Speed is defined as the speedily with which successive movements of the same kind can be performed (Singh 1991).

1.15.7 Agility

Agility is defined as speed in changing body positions or directions (Singh 1991).

1.15.8 Cardio Vascular Endurance

Cardiovascular endurance is the ability to continue activities that tax the cardiac circulatory and respiratory functions (Franks 1992).

1.15.9 Resting Pulse Rate

The total number of beats of pulse on a relaxed position is called resting pulse rate (Shaver 1982).

1.15.10 Systolic Blood Pressure

As blood is ejected into the aorta and other arteries during ventricular systole, the pressure increased to a maximum called systolic blood pressure (Guyton 1979).

1.15.11 Diastolic Blood Pressure

As blood drains from the arteries during ventricular diastole the pressure decreases to a minimum called diastolic blood pressure (Guyton 1979).

1.15.12 Vital Capacity

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

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

1.15.13 Self Concept

Self-concept is the totality of altitude judgment and values of an individual relating to his behavior, ability and qualities, self-concept embraces the awareness of these variable and their calculation (Lanson 1971).

1.15.14 Achievement Motivation

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

1.15.15 Anxiety

Anxiety is a psychological factor. Anxiety differs from arousal in that it encompasses some degree of co-alleviation and unpleasant emotional state. Thus the term anxiety is used to describe the combination of intensity of behavior and emotion. The direction, a characteristic of anxiety is negative in that it describes feelings that are unpleasant (Kamlesh 1990).