

CHAPTER I

INTRODUCTION

"We could all use a little coaching. When you're playing the game, it's hard to think of everything."

- **Jim Rohn**

Now a days, more and more individuals particularly boys and girls are affected by sports activities and increasing the number that are representing in the sports area. As preventive and curative health measures, it has become more successful throughout the world and, millions of teenagers should have chance of enjoying sports.

During the last decade we have discovered that good health is no longer a matter of chance, but rather a matter of choice. If you choose to take responsibility for your health by exercising regularly and by consistently adopting other positive life style habits, you can not only promote better health, but also you can decrease your risk of disease, disability and premature death. **(Robert Hockey, 1993)**

The lack of agreement regarding the concept of physical fitness basically centers on whether or not items involving skill and ability should be included in such a battery. Some authors list only the relatively basic elements, such as strength, muscular endurance and cardiovascular endurance. Others build from this base and include items of agility, flexibility, power, balance, speed and neuromuscular coordination.

1.1 SPORTS

Sport is the way which we use our physical capacities to play. Sports is an important in other ways, when one's body works better his mind works better, his brain and his body are interrelated. Sports allows you to blow of tension, to forget your problems for a while and to go out and have a good time no matter what other pressures one may be under in his life.

A sport is in man's blood, sport is recreation as well as competition. Basically, sports are individual activities relating and revitalizing in nature and meant to provide opportunities to the individual to make two 'fullest' and the most intelligent use of leisure time. The adaptation of two human body to physical exercise through various sports activities can improve the health of internal system and the efficiency of external movements. Such an adaptation to one kind of 'stress' may also prepare two person physically emotionally to resist other stresses of life. Sports are the way which we use our physical capacities to play. **(Bruce Jenner, 1984)**

Physical activity is an important and essential element in human health and well-being and its importance has achieved widespread acceptance by the public, professional's organizations and medical community.

Sports have assumed worldwide importance in a shrinking world, which is coming nearer and nearer, day by day it is playing an important role in bringing people together at national and international level. It doesn't distinguish between religion, caste, read or race; it embraces every sport and region of the world. **(O P Sharma, 1998)**

First the way sports are organized and played may be a reflection of other institutions in a particular society. In this sense, the composition of an American football team is a reflection of the management structure of American Corporations, with a single leader. The quarter back (CEO), fitness players called running backs and receiver and defense. Second sport may be a symbolic expression of the use values of the culture such as achievement, individuality, teamwork and winning. As a symbolic expression that takes place in public sport plays the important role of communicating care values to all members of society and is especially important as way for adults to communicate values to children. (Daviid Levinson, 1999).

1.2 PHYSICAL EDUCATION

Physical education is an integral part of education aims at all round development of man. It is education through physical activities for the development of the total personality of the child of its fitness and perfection in body, mind and spirit. Physical education is generally associated with competitive sports or development of muscles or body building or military drill and calisthenics. Since physical education is an integral part of education, it is obvious that physical education and education should both work harmoniously in the total process of education.

1.3 TRAINING

The major objective in training is to cause biological adaptations in order to improve performance in a specific task to enhance physiological improvement effectively

and to bring about a change, specific exercise and over load must be followed. By exercising at a level above normal a variety of training.

In general physical training imposes stress on the body tissues, in particular, the muscles. Chronic muscular activities which occur during training can be considered a positive form of stress because it stimulates growth and improves muscular performance. The most of the changes that occur in the muscle as a result of training are gradual and occur over several weeks or months. The magnitude of this muscular adaptation is somewhat proportional to the amount of exercise performed during training.

There is now a much broader base of knowledge regarding these special human beings and athletes and this is directly reflected in the methodology of training. New methods are surfacing which are often found to be useful in daily training. **(Jack, 1988)**

The information collected from the training process includes physiological, biochemical, psychological, social and methodological information. Although this information is diverse it comes from the same source namely the athlete, and is produced by the same process, the training process. Training program needs to also include periods of regeneration and recovery between training lessons, which is a necessary factor to ensure continuous improvement in the athletes performance. **(Tuder, 1994)**

Training denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. Means and measure from several sports scheme disciplines significantly support the training of an advanced sports person. The standard of sports is gaining momentum day by day. New records are

coming into existence at national and international level. It is all because of technical as well as tactical training to complete with advance sports countries. It will only be possible if the athletes are given advance training in the field of physical education and sports. It is only possible with help of research of high calibre. **(Yoingder Prasad Sharma, 1977)**

1.4 SPORTS TRAINING

Today sports training are mostly based upon the competitive motive. Each nation is trying to achieve top-level performance and to win laurels in international competitions. Today records are proved to be lower performance of tomorrow. This is because grater stress has been laid on the quality rather than quantity of training. **(Watron, 1983)**

Sport training is an educational process. It aims at improving the sports performance as well as education or sports man. Model continuing, reward and punishment habitation and tasks are the various methods of education sports training. Which present limited possibilities. Normally sports situations usually lead to high quality of activities of tacking the tasks. Leadership task help to developed leadership qualities. Tasks of planning training assessment, literature study and observation are valuable for improving cognitive abilities. Task involving elements of risk and injury are essential for courage and fearlessness tasks involving competition formal or informal help in improving tactical thinking, confidence, select concept, etc. **(Hardayal Singh, 1991)**

Sport training can be separated from the aggregate of various factors and conditions influencing the growth of an athlete's achievements only abstractly. In the language of the theory of systems, sports training is related not to "closed" but rather to "open" systems, the concept and the form of which depend largely on external factors. When defining the nations, it has been stressed that sports training is especially organically linked with the system of competition and with a number of extra training and extra competitive factors of an athletes training.

According to **Fox (1984)** sports training is a programme of exercise designed to improve the skills and increase the energy capacities of an athlete for a particular event. There basic training procedures will some better when utilized with modifications suited individuals or a group dealt with. The training programme should look into improving the performance of the athlete and at the same time should prevent injury from taking place. Sport training is a basic preparation of a sportsman for better performance through physical exercise.

It is based on scientific principles of aiming at education and performance enhancement. Sports activities consist of motor movement and action and their success depends to a great extent on how correctly they are performed. Techniques of training and improvement of practical efficiency plays a vital role in training process. **(Edward, 1984)**

1.5 YOGA

Yoga is universally benefiting all people of all ages. The study of Yoga is fascinating to those with a philosophical mind and is defined as the silencing of the mind's activities which lead to complete realization of the intrinsic nature of the Supreme Being. It is a practical holistic philosophy designed to bring about profound state as well is an integral subject, which takes into consideration man as a whole. The aim of Yoga is to devise ways and means of helping the better emotional and intellectual concentration.

1.6 MEANING OF YOGA

Yoga is a science of right living and it works when integrated in our daily life. It works on all aspects of the person: the physical, mental, emotional, psychic and spiritual. The word yoga means 'unity' or 'oneness' and is derived from the Sanskrit word 'yuj' which means 'to join'. This type of effort is possible only through the control over sense organs and through continued practice and detachment. "The withdrawal of sense organs from the worldly objects and their control is Yoga".

"Yoga is a timeless practice since over thousands of year dealing with physical, mental, and spiritual well being or human society as whole". 'Stilling the minds movements in Yoga'. (B.K.S. Iyengar, 1983)

"Yoga is a systematic physical practice to improve awareness to develop will power and to realise self to join traditional consciousness (jeevathma) to super consciousness (paramathma). Yoga is the inhabitation of the modification of the mind.

This means that it prevents to contents of the mind from taking different forms.

(Swami Satyananda Saraswathi, 1981)

Yoga was first summarised and systematized around the second century A.D. by Patanjali and his Yoga sutra is still regarded as the classic work on the subject. Hence, Patanjali is known as the father of Yoga. He has joined a number of Yoga sutras regarding Yoga. Yoga has been practised in India for thousands of years, and is traditionally used by spiritual seekers as a system of self-development for purification of the body and mind. **(Heare, 1984)**

1.7 IMPORTANCE OF YOGA

Yogasanas are the physical practices which tone up the internal organs of the body. The body that is visible from outside is only a skeleton covered by muscles cells which give it a shape. Until and unless our internal organs are healthy, we cannot be healthy. We see that the heart works for all the 24 hours and does not take rest even for a single moment. The heart can get rest only when the nerves carrying the blood to and from the heart are clean. Even a small obstruction in them can cause a major disorder. Our lungs should also function properly and take maximum air full of oxygen for purifying the blood. Similarly of juices for the proper digestion of food.

The formation of juices, blood, muscles, fats, bones, semen should take place according to the need of the body. Our nervous system should get strength so that all body movements can be performed in a proper way. The impurities should not get accumulated in the body and we should be able to enhance our muscle power.

Some people, however, question why we should prefer yogasanas to other exercises such as gymnastics, wrestling and popular games.

1. Other exercises affect only the muscles outwardly; therefore, the body appears quite strong and healthy. However, these exercises do not have as much impact on the internal organs of the body as the yogasanas. Yogasanas are very effective in throwing out all our body wastes and in activating our glands, on the proper functioning of which depends our health and happiness. They give wonderful powers and increase longevity. Moreover, in doing asanas the number of cells that break in small, while the number of new cells that are formed is proportionately very large.

2. Other exercises have very little impact on the mind and sense organs. While the asanas improve mental power and help in controlling the sense organs.

3. Yogasanas improve our resistance power against disease and do not allow any external matter to accumulate in the body. In this way, they keep the body free from the diseases.

4. For sports and other exercises, we need considerable space and several persons. Asanas on the other hand can be performed in relatively little space and all by oneself. All that needed is a carpet or bed-sheet. However, we must teach them first from a person who knows the technique well.

5. Yogasanas increase the elasticity of our body and make the body more active and supple. The blood circulation takes place more smoothly and properly and the body becomes capable of more work. We look young in spite of our age. Other exercises, on

the other hand, make the muscles stiff and hard. The body becomes stiff and the old age comes sooner.

6. As a drain is cleaned by sweeping and by putting water into it the different asanas clean the blood-circulation drains of our body in the same way. Clean blood circulates freely in all part of our body, and helps keep our body free from impurities. This is possible only by yogasanas and not by other exercises which increase our heartbeat abnormally. They do not have the capacity to clean the blood unlike the asanas.

7. Our youth depends upon our spine that controls the entire nervous system and blood circulatory organs. The greater the elasticity in the vertebral column the greater the vigour and longer the life.

8. Other exercises have little impact on the character of the person. However, yogasanas not only improve body health, they also have a sobering effect. On the mind, they build up mental and ethical powers. The mind becomes balanced and peaceful. This in turn brings about equanimity and satvic ideas.

9. In fact, yogasanas, Pranayama and six yogic practices of publication are a panacea of all ills. They have a unique power to throw waste products out of the body. They can therefore be depended upon for physical and mental well being.

10. Besides having physical, mental and moral effects, yoga system leads a man to spiritualism. No other system has such wide ranging impact on human body, mind, brain and intellect. Yoga plays an important role by bringing the therapeutic effect in asthma, diabetes, hypertension, and respiratory troubles. Some Yoga has both preventive as well as curative values. Positive changes in the life style of the people can brought through Yoga. During the period of education, Yoga can make them aware of their bodies and further make them realize the need of emotional and physical well being.

Yoga control's one's sense resulting in an integrated personality. Behaviour can also be moulded properly leading balanced personalities.

1.8 ASTANGA YOGA

It is a type of Yoga where one moves relatively quickly through a full range of asanas. This is Yoga where you can really work up a sweat as well as get and keep your heart rate up. It is good type of yoga for a person who is relatively young and already in good health.

1.9 ASANAS

In Sanskrit, Asana means 'sitting down', 'to sit down' is a body position, typically associated with the practice of Yoga, originally identified as a mastery of sitting still, with the spine as a conduit of biodynamic union. In the context of Yoga practice, asana refers to two things: the place where a practitioner (or yogin, in general usage), yogi (male), or yogini (female) sits and the manner (posture) in which he/she sits.

In the Yoga sutras, Patanjali suggests that asana is "to be seated in a position that is firm, but relaxed" for extended, or timeless periods. As a repertoire of postures were promoted to exercise the body-mind over the centuries, to the present day when yoga is sought as a primarily physical exercise form, modern usage has come to include variations from lying on the back and standing on the head, to a variety of other positions. However, in the Yoga sutras, Patanjali mentions the execution of sitting with a steadfast mind for extended periods as the third of the eight limbs of Classical or Raja yoga, but does not reference standing postures or kriyas. Yoga practitioners (even those

who are adepts at various complex postures) who seek the "simple" practice of chair-less sitting generally find it impossible or surprisingly grueling to sit still for the traditional minimum of one-hour (as still practiced in eastern Vipassana), some of them then dedicating their practice to sitting asana and the sensations and mind-states that arise and evaporate in extended sits.

Asana later became a term for various postures useful for restoring and maintain a practitioner's well-being and improve the body's flexibility and vitality, with the goal to cultivate the ability to remain in seated meditation for extended periods. Asanas are widely known as "Yoga postures" or "Yoga positions," but specifically translate to "pose[s] you can hold with ease". By this definition, practices where the participant is not at ease do not qualify as asana.

1.10 AEROBICS

Aerobic refers to a variety of exercises that stimulate heart and lung activity for a time period sufficiently long to produce beneficial changes in the body (**Cooper, 1970**).

“Aerobics” basically means living or working with oxygen. Aerobics or endurance exercises are those in which large muscle groups are used in rhythmic repetitive fashion for prolonged periods of time. Aerobic is a system of exercises designed to promote the supply and use of oxygen in the body. Some of these exercises include running, dancing, rowing, skating and walking. Aerobic exercise increases cardio respiratory fitness, which is the heart’s ability to pump blood and deliver oxygen throughout the body. Some benefits of cardio respiratory fitness are increased endurance

and energy. Weight control decreased blood pressure, decreased heart rate, decreased cholesterol levels, and an increased ability to manage stress.

The word “aerobics” is relatively old in the context of sport and exercise. Cooper has developed an aerobics exercises programme in the spirit of preventive medicine with a view that aerobic types of exercises would be useful to develop cardio respiratory health and fitness.

Many of the early aerobics classes were called “high impact” that is, both feet may be off the floor at any given time. High impact was characterized by running or jogging in place, jumping jacks, and small jumps or hops. This was an exciting beginning to aerobics, however this style created a tremendous amount of stress on the joints, and many of the participants developed impact – related injuries. So ‘low impact’ aerobics was developed in response to the increase in injuries. In low impact aerobics one foot is on the floor at all times, the routines are characterized by marching in place and traveling from one side of the room to the other. The variable impact aerobics is a combination of high and low impact moves with a combination as high intensity impact with the safety of low impact. **(Livenson, 1999)**

The creativity of aerobic instructors and the industry in general have developed new and varied types of aerobic classes. These includes water aerobics, sculpting, strength, abdominal, sports conditioning, and circuit or interval classes.

Aerobics is an efficient method to decrease the percentage of body fat to attain the other metabolic benefits of fitness. Aerobics is also a very good way to develop musculoskeletal fitness while building strength, flexibility and coordination.

Aerobics is a progressive physical conditioning programme that stimulates cardio respiratory activity for a time period sufficiently long to produce beneficial changes in the body. As the intensity and duration of work increases the demand for fuel in the working muscle also increases to meet the additional demand for energy.

The step aerobics, which was developed by Gin Miller while she was recovering from a knee injury, is a trend that took the aerobics industry by storm. This extremely popular style involves stepping up and down from a platform 15 to 30 centimeters (6 to 12 inches) high while performing different step combinations.

In step aerobic exercises the heart rate increases substantially, but never reaches its maximum level. The heart is always able to deliver sufficient oxygen – rich blood to muscles so that they can derive energy from fat and glycogen aerobically. Aerobic exercises builds stamina for sports and it is also the most important form of exercise for health, since it increases the efficiency of heart, circulation and muscles.

Aerobics is extremely beneficial for developing overall physical fitness. Aerobic dance can improve a participant's flexibility, strength, cardiovascular fitness, and reduce the percentage of body fat. The rhythmic movements performed to music also help to develop balance and co-ordination. The popularity of aerobics is also attributable to the social support, understanding and reinforcement inherent to a group exercise situation.

To ensure safe and effective aerobic exercise programmes with training, educational organizations emerged to help guide the aerobics industry. The fundamental components of the aerobic exercise programme consists of five segments: the warm – up or pre stretch (10 min) the aerobic segment (20 – 45 min) cool down (5-10 minutes), strength work (10-20 min) and the final stretch (5-10 min).

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Aerobics and step aerobics are more efficient method to decrease the percentage of body fat to attain the other metabolic benefits of fitness. It has also a very good way to develop musculoskeletal fitness while building strength, flexibility and coordination. Aerobic exercise has positive effects on stamina, blood pressure, weight, sleep patterns, energy levels, lipid profiles, and can reduce the risk of cardio vascular diseases, diabetes and certain type of cancer.

It is strengthening muscles involved in respiration to facilitate the flow of air in and out of the lungs. Toning muscles throughout the body which can improve overall circulation and reduce blood pressure. Increasing the total number of red blood cells in the body, to facilitate transport of oxygen throughout the body. Regular vigorous activity can stimulate bone growth, as well as reducing the risk of osteoporosis for both men and women.

Aerobic exercises are very popular for many trying to lose weight. They can be very effective in burning a large amount of total energy in a single session. However if a person is overweight and/or unfit the class may become too intense for proper fat burning, especially if the individual is highly motivated to keep up with other, fitter members of the class. For this individual breathing would become heavy and this will always result in carbohydrates becoming the predominant fuel, pushing the percentage of fat burning down as low as 30%.

Aerobic endurance is generally characterized by moderate contractions of large muscle groups for an extended period of time, during which maximum cardio respiratory adjustments are necessary. Since aerobic endurance refers to the ability of the heart, vascular system and lungs to provide oxygen and nutrients to the working tissues and to remove the waste products of metabolism, it is quite clear that the primary goal of aerobic endurance training is to improve or increase the capacity and efficiency of three system in order that a greater amount of oxygen can be supplied to the cells. This type of training is said to be cardio vascular training.

1.11 PROPRIOCEPTIVE EXERCISES

The term proprioception refers to a sense of joint position. Proprioception training is highly common in rehabilitation of injured athletes, but it can just as easily be used to prevent injury. Even a strong ankle can sprain when running on uneven ground if the runner hasn't trained the neuromuscular system to react appropriately. Slight deviations in terrain require slight adjustments of balance to avoid injury.

Proprioception is the body's ability to transmit a sense of position, analyze that information and react (consciously or unconsciously) to the stimulation with the proper movement (Houglum 2001). Put simply, it is the ability to know where a body part is without having to look. Proprioception allows you to scratch your head without looking in the mirror or walk up a flight of stairs without having to peer at each stair.

Taken as a whole, proprioception includes balance, coordination and agility because the body's proprioceptors control all these factors. Proprioceptors consist of both sensory and motor nerves that send and receive impulses to and from the central nervous system from stimuli within the skin, muscles, joints and tendons (Houglum 2001). These impulses transmit vital information, such as the amount of tension in a given muscle and the relative position of a body part during a given movement.

By improving their proprioception, clients can gain the balance skills necessary to maintain stability; hone their agility so they can quickly change direction when necessary; and fine-tune coordination skills so they can perform physical activities accurately and consistently. Proprioception exercises reduce the risk of injury by teaching the body to react appropriately to sudden changes in the environment. A good sense of proprioception is vital for many fitness activities, especially some of the more advanced core-training classes currently attracting large numbers of clients.

1.12 IMPORTANCE OF MOTOR FITNESS

Motor fitness is a term that describes an athlete's ability to perform effectively during sports or other physical activity. An athlete's motor fitness is a combination of

five different components, each of which is essential for high levels of performance. Improving motor fitness involves a training regimen in all five.

There are many different manifestations of fitness. Some examples include strength, stamina, speed, and flexibility. Certain types of fitness, such as an athlete's cardiac fitness level, are more important than others. An athlete needs to be aware of the various types of fitness to develop an effective training program

1.13 SPEED

Speed is one of the main requisite, which enable for higher performance in certain tasks. A person is born with muscles capable of working at speed.

The capacity for work of a sustained nature is very limited – probably in the region of 30-40 seconds for a major group, fast acting fibers also have to receive a special nerve impulse which is probably more refined in some people than others, so promoting the natural gift of speed. **(Wilf Paish, 1991)**

“It is the performance prerequisite to do motor actions under give conditions (movement task, external factors, individual prerequisites) in minimum of time”. **(Hardayal Singh, 1991)**

Ability to perform rapidly successive movements over a short period of time in a single direction is known as speed. Speed is the performance prerequisite to do motor actions under given conditions movement task, external factors individual prerequisite in minimum of time. Speed is an important factors in all games. The modern concepts of

speed embraces their abilities which make it possible for volleyball players to execute the most suitable action for a given situation as rapidly as possible. (**Janet Pauks, 1990**)

An athlete's speed is largely determined by genetics. It can be improved at least somewhat through explosive strength training through learning efficient movement techniques and through speed training teach players efficient techniques to apply what explosive force they might inherently have in the right direction some players waste force by scattering it in different directions or even applying it in an opposite direction. (**Carl Gown, 1994**)

The sub domain a speed is important a number of athletic competitions and is most commonly measured by a short sprint. The domain of speed, and found (commonly called agility), arm speed, and leg speed. Because these are distinct factors, it is necessary to measure them all if a comprehensive measure of speed is required.

Speed represents the components of athletic fitness that is important for success in sports, requiring extreme and rapid force production. Speed can be increased either by increasing the amount of work or practicing the skill development. (**James Marrow, 1995**)

“Speed is the capacity of moving a limb or parts of the body or level system of the whole body the greatest possible velocity”.

“Speed may be defined as the rate at which a person can propel his body or parts of his body through space”. (**Frank William Dick, 1980**)

Speed is the most important component of physical fitness. Without speed there is no sports and physical education. Speed of muscular contraction is an innate quality. But speed of movement can be gained through practice. Speed is a rapidity movement and it can be tested with 50 yards dash. (**Barry L Johnson, 1986**)

Speed is related to the percentage of fast twitch muscle fibres in the athlete's body, because the quantity of fast twitch muscle fibres is partially inherited. It is difficult to significantly improve an athlete's speed. However it can be done. Speed of movement depends on the combination of two elements, reaction time and movement time.

1.14 EXPLOSIVE POWER

It is essential that explosive strength play a large role in training, as it is not only a means of developing absolute strength but also a method of raising physical fitness that is directed toward solving a specific sports task.

Many sports combine jumping as part of the sport itself, such as ball games and gymnastics. Here jumping, or Plyometrics, aids greatly in raising GPP. In sports like powerlifting, explosive strength can be developed with the reactive or contrast method, which includes the use of weight releasers, bands, or chains or by special means such as jumping onto a box of a designated height or standard Plyometrics, which refers to depth jumps, altitude jumps, or bounding drill on one foot or both. The reason for including these exercises is the development of powerful legs and hips.

It is important to direct a series of work to closely duplicate your sport, in our case, the squat, deadlift, and bench. Two types of training methods are used to develop explosive strength. The first is the use of a barbell with special attachments, such as bands, chains, weight releasers, or a combination of all three. The second method involves jumping exercises.

Jumping exercises and/or plyometrics cause the fastest rate of explosive strength because as resistance is lessened, the motion time becomes shorter. This is caused by a sudden eccentric stretch of the muscles and connective tissue preceding a voluntary effort. The faster the eccentric phase, the faster the concentric phase through an increase in kinetic energy. Explosive strength can be developed by using moderate resistance with maximum speed. This is the dynamic method. Two simple training methods to accompany the dynamic method are the box squat from squatting and pulling strength and the floor press with dumbbells or a barbell. For both exercises, after the eccentric phase, many of the muscles are in a relaxed state. This is followed by any explosive concentric motion. This will increase the rate of force development (RFD).

1.15 AGILITY

Agility is the ability to change the body's position efficiently, and requires the integration of isolated movement skills using a combination of balance, coordination, speed, reflexes, strength, endurance and stamina.

In sports, agility is often defined in terms of an individual sport, due to it being an integration of many components each used differently (specific to all of sorts of different

sports). Sheppard and Young (2006) defined agility as "a rapid whole body movement with change of velocity or direction in response to a stimulus."Agility is the ability to change the direction of the body in an efficient and effective manner.

1.16 REACTION TIME

Reaction time is the interval time between the presentation of a stimulus and the initiation of the muscular response to that stimulus. A primary factor affecting a response is the number of possible stimuli, each requiring their own response.

Reaction time itself is an inherent ability, but overall response time can be improved by practice. Coach and athletes need to analyse the type of skill and the requirements of their sport and decide where overall response gains can be made. Consider the following:

- **Detecting the cue** - in a sprint start, focusing on the starter's voice and the sound of the gun and separating this from background crowd noise and negative thoughts
- **Detecting relevant cues** - a goalkeeper learning to analyse body language at penalties
- **Decision making** - working on set pieces and game situations
- **Change in attention focus** - being able to switch quickly from concentration on the opponent to concentration on the field of play in invasion games
- **Controlling anxiety** - which slows reaction times by adding conflicting information
- **Creating optimum levels of motivation** - 'psyching up'

- **Warm up** - to ensure the sense organs and nervous system are ready to transmit information and the muscles to act upon it

1.17 IMPORTANCE OF PHYSIOLOGY IN SPORTS

To maintain a healthy lifestyle, the importance of physical activity can not be underestimated. It is the single most important endeavor that one can participate in to promote health throughout a lifetime. For decades, epidemiological research has accumulated highlighting the health benefits associated with regular physical activity. Furthermore, there is overwhelming research illustrating the morbid and mortal consequences of being sedentary. Exercise Physiology is the identification of physiological mechanisms underlying physical activity, the comprehensive delivery of treatment services concerned with the analysis, improvement, and maintenance of health and fitness, rehabilitation of heart disease and other chronic diseases and/or disabilities, and the professional guidance and counsel of athletes and others interested in athletics, sports training, and human adaptability to acute and chronic exercise.

1.18 VITAL CAPACITY

Vital capacity is the maximum amount of air a person can expel from the lungs after a maximum inspiration. It is equal to the inspiratory reserve volume plus the tidal volume plus the expiratory reserve volume.

A person's vital capacity can be measured by a spirometer which can be a wet or regular spirometer. In combination with other physiological measurements, the vital capacity can help make a diagnosis of underlying lung disease. The unit that is used to

determine this vital capacity is the milliliter (ml). This is the maximum volume that an individual can expire after a single maximal inspiration. In contrast to the forced maximal capacity the expiration is not performed as quickly as possible but as completely as possible. The Vital Capacity is the total lung capacity minus the residual volume. The Vital Capacity is reduced in both obstructive and restrictive respiratory disease.

The Vital Capacity is:

- usually 3-6 liters, varying with age, gender and height
- reduced in obstructive and restrictive defects
- correlated with disability in chronic respiratory disease

1.19 RESTING PULSE RATE

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 up to five beats per minute within the normal range. The number of beats of a pulse per minute or the number of beats of the heart.

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.

Heart rate is the number of heartbeats per unit of time, typically expressed as beats per minute (bpm). Heart rate can vary as the body's need to absorb oxygen and excrete carbon dioxide changes, such as during exercise or sleep.

The measurement of heart rate is used by medical professionals to assist in the diagnosis and tracking of medical conditions. It is also used by individuals, such as athletes, who are interested in monitoring their heart rate to gain maximum efficiency from their training. The R wave to R wave interval (RR interval) is the inverse of the heart rate.

Heart rate is measured by finding the pulse of the body. This pulse rate can be measured at any point on the body where the artery's pulsation is transmitted to the surface by pressuring it with the index and middle fingers; often it is compressed against an underlying structure like bone. The thumb should not be used for measuring another person's heart rate, as its strong pulse may interfere with correct perception of the target pulse.

The resting heart rate (HR rest) is a person's heart rate when they are at rest, that is lying down but awake, and not having recently exerted themselves. The typical resting heart rate in adults is 60-90 bpm,[2]with rates below 60 bpm referred to as bradycardia, and rates above 100 bpm referred to as tachycardia. Conditioned athletes often have resting heart rates below 60 bpm, with values of below 40 bpm not unheard of. For instance, cyclist Lance Armstrong has been known to have resting heart rates to as low as around 32 bpm, cyclist Miguel Indurain had a resting heart rate of 28 bpm. The low pulse in conditioned athletes is due to hypertrophy of the cardiac muscles, therefore enabling a higher volume of blood being pumped at each beat (i.e. higher stroke volume).

The maximum heart rate (HRmax) is the highest heart rate an individual can safely achieve through exercise stress, and depends on age. The most accurate way of measuring HRmax is via a cardiac stress test. In such a test, the subject exercises while

being monitored by an EKG. During the test, the intensity of exercise is periodically increased (if a treadmill is being used, through increase in speed or slope of the treadmill), continuing until certain changes in heart function are detected in the EKG, at which point the subject is directed to stop. Typical durations of such a test range from ten to twenty minutes.

Standard textbooks of physiology and medicine mention that heart rate (HR) is readily calculated from the ECG as follows: $HR = 1,500/RR$ interval in millimeters, $HR = 60/RR$ interval in seconds, or $HR = 300/\text{number of large squares between successive R waves}$. [citation needed] In each case, the authors are actually referring to instantaneous HR, which is the number of times the heart would beat if successive RR intervals were constant.

Conducting a maximal exercise test can require expensive equipment. People just beginning an exercise regimen are normally advised to perform this test only in the presence of medical staff due to risks associated with high heart rates. For general purposes, people instead typically use a formula to estimate their individual maximum heart rate.

1.20 CARDIO RESPIRATORY ENDURANCE

Endurance is the ability of the person to perform movement of moderate (Sub-maximum) contractions over prolonged period of time under conditions of fatigue or tiredness. It is the product of all psychic and physical energy of human body.

Cardio respiratory endurance is the ability work close to one's maximum aerobic capacity for a prolonged period of time. To increase one's endurance is depend upon

increasing the ability to work at high, relative work load for extended periods of time.

(Jack Daniels, 1978)

Cardio respiratory efficiency may be defined as the ability of the heart and circulatory system to adjust to the stress of activity. **(Vere Skubi, 1963)**

It is a physiological fact that the human organism needs stimulating exercise. When your total body is subjected to regular molecular activity, requiring a vigorous stress on the heart, lungs and muscles, the general efficiency of our physiological functions improves. There is no scientific evidence for a healthy person. But an abundance of research now strongly supports the theory that regular, vigorous exercise helps keep healthy hearts and may prevent cardiovascular disease. A physically fit heart beats at a lower rate & pumps more oxygen, which denotes the substantial increase of ability to do more physical work. People who keep fit greatly enlarge their fullness of living.

1.21 BREATH HOLDING TIME

Breath holding time is defined as the duration of time through which one can hold his / her breath without inhaling and exhaling after a deep inhalation.

There are two types of breath hold time:

- Positive Breath holding time
- Negative Breath holding time

Endurance type of training will improve the breath holding time. Breath holding time also plays a vital role in the sports performance. **(P.J.Strukic, 1981)**

1.22 IMPORTANCE OF FOOTBALL SKILLS

One of the most important football skills a player should practice is to improve their ability to instantly control the ball using any surface. This football skill will enable the player to then make a decision on the next pass or shot. Football coaches should look to provide training practices that encourage the players to work on and improve their football skills of ball control.

Football skill sessions that focus on and encourage the players to work on and improve their ball control using a variety of surfaces such as the foot, the thigh, the chest and the head are all related to the skills the players will require in matches. These football coaching sessions should also provide lots of different paced and height passes, which again, will test the player's ball control football skills.

1.23 FOOTBALL

Football is played as well as enjoyed by multitudes of people all over the globe. This is one of the most recognized sports football acquired popularity among the Indian masses with in a short period of time and is the popular as well as widely played Indian sports. Although the modern game of football had emerged in England in its primitive form, it had undoubtedly been played for centuries in other countries claim that the game had been played in their countries from very ancient time. Soccer the game evokes an out pouring passion and emotion unparalleled within the realm of sport. Soccer is a common language among peoples of diverse backgrounds and heritages, a bridge that spans economic political cultural and religious barriers. Known as foot ball throughout most of the world and in Indian sub continent. Soccer is the

national sport of many countries in Asia, Africa Europe and South America. Soccer is a game which requires both aerobic and anaerobic fitness for parts of the game, one will work anaerobically. Most commonly this will come in the form of short sprints these periods are followed by longer spells of jogging and walking. **(Roy, 1994)**

All footballers, whatever their position, need a certain level of basic fitness. But once this is achieved, each player must connect improving specific areas of their fitness. Football is fast, quick, aggressive and attractive it is considered a strenuous game because the game demands a high degree of fitness as well as intelligence and alertness of mind Speed, endurance, strength, agility, balance, flexibility are the basic qualities for all the elite players. **(Eric Worthington, 1980)**

There are four physical abilities, which are relevant to an understanding of the nature of football skill they are speed, strength, endurance and mobility. The greater or lesser degree of proficiency is possible within each one of them there is a close relationship between each of them.

The key for football skill is technique - without it a player's armory is incomplete. A player may be the fittest player in the world but, if he cannot control and govern the ball, his fitness is worthless. Basic technique hinges on the ability to master a pass quickly and clearly 'control and pass' is a phrase one will hear time and time again on training fields and then only one can participate constructively in a game Joseph, (1996). With the modern game becoming more and more physical and fast, never has the need for a player to have good all-round ability and acceptable technique been greater. Forwards were assigned the sole task of scoring goals and

defenders were expected to prevent the opposition from scoring. Positional responsibilities were narrowly defined and there was little overlap of roles. Soccer today requires much more from players. The modern game places a premium on the complete soccer player that is the individual who can defend as well as attack. **(Joseph, 1996)**

Football is a game which calls for strenuous, continuous thrilling action and therefore, appeals to the youth the world over. The skills involved in the game are simple, natural and yet are highly stimulating and satisfying to anyone who participates in the game". Football as it is popularly called in India is a game where the foot is used much more than any part of the body. Bernard Shaw's comment underlines this reality that "Footballers think with their feet". Game of football is very complicated in terms of skills and teamwork. Control of the football is perfected by the development of fundamental skills like kicking, passing, dribbling, trapping, tackling and heading etc. The unpredictability of the action sequences fosters imaginations of a kind that can be transformed instantly into physical movements.

The game football is both an art and science. There is a distinction, which gives a specialty to football compared to that of other games. It is the natural behavior of human beings to use their hands and arms for doing almost all activities. In all other games, hands are dominantly used. But in football, the use of hand has been restricted which is only used for throw in (Exception is given only to goal keeper-that too inside the penalty area) and all other parts of the body are allowed to play, especially to use the foot., Thus, when trying to control the ball using all parts of the body except hand in order to score a goal, it becomes a beautiful game. It individual techniques of

running, passing, kicking, tackling, blocking, heading, juggling and dribbling. All these activities have often to be performed at great speed. Though these individual skills are very important, it should not be forgotten that it is a team game and the players have to work together in offence or defense.

A player must therefore, develop his skill and should understand his contribution according to the situation demands in the team play. Therefore working in a competitive situation can develop the skills though individual practice is necessary. The game of football contains physical challenges. Though two players may be equal in their skill, because of different physical and mental response, there can be much difference in their performance. A player must be quick in assessing a situation and thus to respond rapidly. A forward has to decide between a pass and shot, a defender between marking and covering and a goalkeeper has to decide whether advance or to be in the goal. A player may specialize, for play in a particular position. It is better if he develops skills necessary for other positions. All players should be aware of both the attacking and defensive principles of play. A player must learn from his own observations and mistakes. **(Thomas J P, 1964)**

The game of soccer demands a level of fitness that will enable the player to run strongly to move quickly off the mark in any direction, to control and pass accurately and to tackle effectively throughout the game.

All desires a system of training that will produce the most rapid increase in strength, endurance, speed, agility and co-ordination within a limited period of time. A great deal of controversy exists among coaches and athletes today as to what is the most efficient training programme to achieve improvement of motor skills

performance. Some of the systems followed nowadays are experimentally supported, some are traditional and some are highly controversial.

There is evidence of more systematic training and selection influencing the motor fitness components of players who compete at the highest level fitness is being optimized to cope with match demands while accommodating the need for specific requirements of positional roles and skill performance of football players.

(Ken Jones, 1984)

All sports involve the application of skills of some kind of cognitive, intellectual, perceptual or motor. Football involves all three- skill types operating simultaneously in a rapid changing environment. Soccer skills involve making correct decisions and then executing that which has been decided upon. A technical practice involves players working in isolation on the various aspects of the game such as shooting, passing, and ball control. The execution of a technique or soccer action such as passing or dribbling is a part of skilled performance essential but relatively valueless as lone facet. The players are judged to be truly skillful in the game of football when they can make the best decisions about where and when to play the ball and then to perform the skill accurately. Kicking is a fundamental and versatile technique used for passing, shooting and clearing. True footballers refer to it as striking the ball because it sounds more controlled.

An important skill in the game of soccer is the ability to kick the ball forcefully and accurately. The kick with run-up produces longer and more powerful kicks than the standing kick. An important aspect of the soccer kick is the interplay between the various muscle groups active in the skill. The agonists contract to initiate the movement at each of the joints, but these muscles become the antagonists to slow the

rapid angular movements at the joints just prior to or following release of the ball. (**De Profit, 1988**)

Passing is the life of football. Without passing, there is no football. The renowned footballers are noted for their outstanding ability to pass. To pass the ball to an apt player at right time is one of the most important qualities of a football player.

One of the most critical skills to develop in applying it - as well as the backbone of teamwork in football is passing. It is how a team moves the ball down the field, from one player to another. Passing allows your team to keep possession of the ball and find holes in tile opposing team's defense. As a team, try to keep the ball moving and spread the defense, taking advantage of open spaces. The best way to accomplish this is to play one and two touch pass. Strike the ball with pace so that your teammate doesn't have to wait for the ball. A firm pass is more likely to arrive at its destination. In terms of teamwork, the player who is the intended target of your pass must go to the ball. At the same time though, make your teammate look good by digging out a bad pass and keep possession.

Dribbling is propelling the ball from one plabe to another without losing the control. But according to the situations the way of dribbling will differ. According to Yaxley' "the good dribble 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 special (from slow to top special instantly) without losing. the ball, to screen the ball from his opponent when necessary, i.e. place his body between the ball and his opponent while dribbling thus be able to see team mates, opponents and own position relative to goal". (**Mike Yaxley, 1982**)

Even though dribbling is one of the most valuable fundamental skills in soccer, when it is done too often and for too long a time, it can completely distort a team's offense or defense 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 shot at goal represents a tactical action being quite decisive for the match. The success of the shot at goal is not only the matter of technique and strength, but it requires also a good survey on the match, concentration and resoluteness.

To incorporate physical activity as a long-term behavioral change, the type, duration, intensity and frequency of the activity needs to be realistic, achievable and pleasurable. Physical fitness is important to everyone. Once when people are physically fit they look better, sleep better, think more clearly and resist disease and tension more easily. **(D.W.Baid, 1998)**

1.24 OBJECTIVE OF THE STUDY

Yogic practices play an important role in the development of the balance created in the nervous and endocrine systems which directly influences all the other systems and organs of the body. The very essence of yoga lies in attaining mental peace improved concentration powers, a relaxed state of living and harmony in relationships.

Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines with the goal of improving all elements of fitness (flexibility, muscular strength, and cardio-vascular fitness).

Proprioception is the body's ability to transmit a sense of position, analyze that information and react (consciously or unconsciously) to the stimulation with the proper

movement. However, no study has been conducted on effect of asana, aerobics and proprioceptive training on selected motor fitness, physiological, performance variables among football players.

Hence, the investigator had taken up the research to find out the effect of asana, aerobics and proprioceptive training on selected motor fitness, physiological, performance variables among football players.

1.25 REASON FOR THE SELECTION OF THE TOPIC AND VARIABLES

High level of sports performance depends upon various factors such as genetic factors, training status, physical structures, nutritional factors, psychological factors, physiological factors, socio-economical factors and techniques. However, the requirement of the above facts in mind, the researcher has selected this topic with considering the important of various training procedures. Further, the selected dependent variables have close association with yoga, aerobics and proprioception.

1.26 STATEMENT OF THE PROBLEM

The main purpose of the study was to find out the effect of asanas aerobics and proprioceptive training on selected motor fitness physiological and performance variables among football players.

1.27 HYPOTHESES

The following hypothesis were drawn for this study,

1. There would be significant improvement on selected criterion variables such as speed, explosive power, agility, reaction time, vital capacity, resting pulse rate, cardiovascular endurance, breath holding time, dribbling ability, passing ability

and shooting ability among football players due to asanas, aerobics and proprioceptive training.

2. There would be a significant difference among the experimental groups on selected motor fitness (speed, explosive power, agility and reaction time), physiological (vital capacity, resting pulse rate, cardio vascular endurance and breath holding time), performance variables (dribbling ability, passing ability and shooting ability) among football players.

1.28 DELIMITATIONS

The following were the delimitations of the study

1. This study conducted for eighty intercollegiate men football players from four different colleges in Chennai city namely in Alpha Arts and Science College. Porur, Sindhi College of Arts and Science. Tiruverkadu, Hindustan College of Arts and Science, Padur, and Guru Nanak College, Vealachery, Chennai, Tamil Nadu, India were randomly selected as subjects.
2. The age groups of the subjects were ranged between 18 to 28 years.
3. The selected subjects were divided in to four equal groups of twenty subjects each. Group I underwent asanas training, Group II underwent aerobic training, and Group III underwent proprioceptive training for twelve weeks in a schedule of three days per week. Group IV acted as control group and they did not

participate in any special training programme apart from their regular football practice as per their curriculum.

4. The duration of experimental period was twelve weeks and the experimental session in a schedule of three days per week.
5. The following motor fitness, physiological and performance variables namely speed, explosive power, agility, reaction time, vital capacity, resting pulse rate, cardio vascular endurance, breath holding time, dribbling ability, passing ability and shooting ability were only selected for the study.
6. The selected criterion variables for the study were assessed by using the following standardized test items speed, explosive power, agility and reaction time were assessed by using 50 mts run, vertical jump, shuttle run and reaction timer. Vital capacity, resting pulse rate, cardio vascular endurance, breath holding time were assessed through wet spirometer, radial pulse, cooper's 12 minutes run / walk test and holding the breath for time. Dribbling ability, passing ability and shooting ability were measured by using F-MARC test battery.

1.29 LIMITATIONS

In this study, the following limitations were drawn.

1. No change was made in the daily routine activity of the subjects which might influence results during the collection of data and this was considered as limitation.

2. The climatic conditions at the time of conducting the test might influence the performance of the students.
3. No effects were made to either control or assess quality of food ingested. The quantum of physical exertion, life style, psychological stresses and these were recognized as a limitation.
4. The general mode, environmental factor and performance in the test by the subject were also recognized a limitation of the study due to varied social, cultural and environmental factors were not taken in consideration.
5. The previous experience of the subjects in the training was not considered.

1.30 SIGNIFICANCE OF THE STUDY

1. The study will help to know the level of improvement of selected motor fitness, physiological and performance variables through asana, aerobics and proprioceptive exercises.
2. The results of the study would provide an additional knowledge in the area of research.
3. The results of the study might be helpful for the budding researchers in future to develop more studies about various training methods.
4. The results of this study may help the physical educationist and coaches to use these training methods to improve physical fitness of their athletes and players.

1.31 DEFINITION OF THE IMPORTANT TERMS

1.31.1 Yogic Practice

Gore (1985) explains, “Yogic practices are generally looked up as exercise and many time interpreted in the light of exercise physiology. The physiology of yogic practices differs greatly from that of exercise physiology. The nature of every yogic practice is Psycho Physiological”.

1.31.2 Aerobics

Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines with the goal of improving all elements of fitness (flexibility, muscular strength, and cardio-vascular fitness).

1.31.3 Proprioception

Proprioception is the sense of the relative position of neighboring parts of the body and strength of effort being employed in movement.

Proprioception is the body’s ability to transmit a sense of position, analyze that information and react (consciously or unconsciously) to the stimulation with the proper movement. (**Houglum, 2001**)

1.31.4 Speed

“Ability to perform rapidly successive movements over a short period of time in a single direction”. (**Harrison Clarke, 1945**)

1.31.5 Explosive Power

Measuring the distance between a person’s standing reach and the height he or she can jump and reach has been proposed as a test of leg power. (**Michael Kent, 2006**)

1.31.6 Agility

Agility is generally defined as the ability to change direction quickly and effectively while moving early as possible at full speed. **(Heyward, 2006)**

1.31.7 Reaction Time

Reaction time is the interval time between the presentation of a stimulus and the initiation of the muscular response to that stimulus. **(Heyward, 2006)**

1.31.8 Vital Capacity

The amount of air which can be exhaled from the lungs after taking the deepest breath possible.

It is the total volume of air that can be expired after a maximal inspiratory. Vital capacity represents the total air volume moved in one breath from full inspiration to maximum expiration, or vice versa. **(Heyward, 2006)**

1.31.9 Resting Pulse Rate

“The number of beats while at rest felt in exactly one minute is the resting pulse rate”. It was assessed on the lateral side (radial artery) of the forearm. **(Strukic, 1981)**

The number of beats felt in exactly one minute in resting condition is the resting heart rate. **(The Little Life Dictionary, 1956)**

1.31.10 Cardio Vascular Endurance

It may be defined as a series or repetitions of an activity without unduly taxing the physiological system that furnishes the fuel and oxygen to the muscle. **(Shaver, 1981)**

1.31.11 Breath holding time

The duration of the time through which one can hold his/her breathe without inhaling or exhaling. **(Shaver, 1981)**

1.31.12 Dribbling

Dribbling is nothing more than moving with the ball across the field. It is a skill used to relocate a player into desirable positions where he can shoot or pass the ball. (**Armstrong, 1988**). Dribbling may be defined as the art of using some part of the foot to control the ball or to roll it continuously along the ground during running. (**Roy, 1988**)

1.31.13 Passing

Passing may be defined as “Propelling the ball to the teammate in a fashion that enables the receiver to control the ball.

1.31.14 Shooting

An important skill in the game of soccer is the ability to shoot the ball forcefully and accurately. The shooting with run-up produces longer and more powerful kicks than the standing kick. An important aspect of the football shooting is the interplay between the various muscle groups active in the skill. The agonists contract to initiate the movement at each of the joints, but these muscles become the antagonists to slow the rapid angular movements at the joints just prior to or following release of the ball. (**Association Football**)