CHAPTER I
INTRODUCTION

Modern sports scientists and physical educators are interested in human performance in a variety of sports and games. Researchers have taken sincere effort to find out the relationship of different physiological factors and performance in sports and games. The study of physical fitness has an important and valuable place in modern society due to its close relation to every area of life.

Soccer is by far the most popular sport in the world. Tens of thousands of fans regularly show up for games played in stadiums in every continent. The beautiful game has thrilled and captivated sports fans for more than 100 years. The game spread from the Britain to rest of the world. In 1904, the Federation International de Football Association (FIFA) was formed to regulate international play. Soccer has grown to enormous level of popularity since Second World War. The world cup tournament sets off a wave of Soccer that encompasses the entire world.

Yoga and Health are closely related. Yoga is a popular aid in improving both physical and mental health. This is the basically, the most common goal of people who practice yoga for health reason. For year yoga has been considered therapeutic. Several researches have been conducted to look at the effects of this practice on the body. When yoga is practiced correctly, it helps to reduce the negative effects of stress on the mind and body and can help the body cope with aging. Yoga practice and proper diet can help to improve the flexibility and strength of musculoskeletal system.
Yoga provides holistic approach in coping with respiratory ailments by improving one’s physical, mental and spiritual health.

Yoga for a fact is not a sport; however, it helps players, particularly those who play Soccer, perform better in their game. Yoga is now intertwined to the game, giving the benefits that every players needs. Soccer involves agility and concentration among players. Since they get most of the game by using their leg muscles, chances of their being injured or sprained is much likely. This is where yoga steps into bring enlightenment. Yoga basically emphasizes on a person’s well being, putting it to state where everything is in the right place and in the right track.

Yoga helps Soccer players both in the aspect of physical and mental health. Soccer players who perform yoga are much likely to have a firm and precise mind that is very important in the game. Yoga practices can help the Soccer players in preventing injuries and improving their strength and flexibility. Yoga and Soccer make a great team.

1.1. MEANING OF YOGA

The word ‘Yoga’ is derived from the root “Yuj” or Yoke that means union or merger. The merger of soul with God and the experience of oneness with Him are implied by yoga.

Patanjali stated that “Yoga Cittavrtti nirodha”. It means stilling the mind’s movement. It is also explained as seeing yourself in yourself by yourself. Yoga is a timeless pragmatic science evolved over thousands of years dealing with the physical and spiritual being of man as a whole.

Yoga training is a technique of harmony and also a preparation for the total integration of human personality. Yoga was first summarized 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 formed a number of sutras regarding yoga (195 statements) called yoga sutras.

Yoga is a method by which one can remove ignorance and attain union with the supreme self (Iyengar 1983).

1.2. IMPORTANCE OF YOGA

Yoga is a system of attaining perfect physical and mental health. The body is the temple of soul and to attain harmony of mind, body and spirit, the body must be physically fit.

Yoga controls one’s senses resulting in an integrated personality. Positive changes in the life style of people can be brought through by yoga. Behaviors can also be moulded properly leading to balanced personalities. It clearly reveals that there will be a sound mind only in a sound body. To keep our body in good condition, it is essential that the various organs and systems of our body must be in good condition. Yogic exercises play an important role in the maintenance of the above systems. The practice of yoga not only develops the body but also enhances the mental faculties. Moreover, the yogi acquires mastery over the involuntary muscles of his organism.

The Bhagavadgita gives several Meanings of “Yoga” e.g. Evenness of Mind (Samatvam II -48) skill in action (Karmasu Kausalam, II -50) disconnection from union with pain (dukha samyoga viyogam, VI -23) etc. Sridhara, commenting on Gita explains ‘Yoga’ as ‘Oneness with God’
(Paramesvaraikaparata), while Dhanapati in his Bhasyotkarsadipika says that oneness with God is nowhere mentioned by samkara as the meaning of ‘yoga’ and therefore he is in favour of ‘Samatvam’ as the Meaning of ‘Yoga’. Looking at this variety of meaning of the word ‘Yoga’ in the Gita, Dasgupta says that there is not one definition of ‘Yoga’ but many and he suggests ‘association’ as its meaning which he thinks will suit the different contexts in the Gita.

Yoga is a system of psycho physical training that has its uncovering of mystical consciousness. The yoga asanas not only to develop the muscles and the body but also regulate the activities of all the internal organs and glands to positively affect the nervous system which controls our well being to a greater degree than we actually suppose.

Best of all, yoga is apt for all, regardless of age, color, caste, creed or religion; from the healthiest to the sickest, from the richest to the poorest, from the whitest to the blackest. Here are some of the specific and immense benefits of yoga.

**Yoga:**

1. Brings down stress and enhances powers of relaxation.
2. Boosts physical strength, stamina and flexibility.
3. Bestows greater powers of concentration and self control.
4. Inculcates impulse Control.
5. Helps in rehabilitation of old and new injuries.
6. Intensifies tolerance to pain and enhances mental clarity.
7. Boosts functioning of the immune system.
8. Enhances posture and muscle tone.
10. Results in healthy, glowing skin.
11. Cleanses and improves overall organ functioning.
12. Bestows peace of mind and a more positive outlook to life.
13. Infuses a sense of balance and internal harmony.

Best of all, yoga is highly therapeutic. Some of the ailments proven to be relieved, reversed and even healed through the practice of yoga are: allergies, Alzheimer disease, anemia, anger, anxiety, arthritis, asthma, back pain, bronchitis, cancer, carpal tunnel syndrome, chronic fatigue, colitis, constipation, depression, diabetes, epilepsy and eye problems.

Other disorders include facial wrinkles, gastro–intestinal disorders, headaches, heartburn, hemorrhoids, hepatitis, high blood pressure, hypertension, immune- deficiency, impotence, menopause, menstrual cramps, migraines, multiple sclerosis, muscular dystrophy, nervous tension, obesity, osteoporosis, prostate, enlargement, sciatica, skin problems, sleep apnea, slipped disk, sterility, stiffness, stress, insomnia, intoxication, thyroid problems, kidney stones, stuttering and stammering, urinary tract disorders for women and vaginal infections (Iyengar 1983).

Yoga universally benefits 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 leads to complete realization of the intrinsic nature of the Supreme Being. It is a practical holistic philosophy designed to bring about profound state of well-being and is an integral subject, which takes into consideration of Man as a whole. The aim of yoga is to devise ways and means of helping better emotional and intellectual concentration.
“Yoga is a methodized effort towards self perfection of the potentialities latent in the being and union of the human individual with the universal and transcendental existence which we see partially expressed in man and in the cosmos” (Iyengar 2001).

Asanas and physical exercises enable the body to be physically fit. These exercises play an important part in helping the pupils to maintain a slim and youthful body. Several tests and experiments have been conducted to know the values and importance of asanas. The most important point to realize before the practice of yoga is that, the asanas are not just simple exercise but sustained scientific pattern of postures, (Chandrasekaran, 1999).

1.3. EIGHT LIMBS OF YOGA

The great yogi, Patanjali, has enumerated what is called as raja yoga. The Patanjali’s Raja Yoga lays down an eight fold path to reach the goals of life. They are referred to as “Eight Limbs of yoga” (or) Astanga Yoga.

Eight limbs of Yoga are Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi. These eight limbs are interlinked with one another. Each limb has a lot of facets within it. They can be realized or experienced only through the study of the texts and practice of the same in our life. Each limb leads progressively to the next higher stage of awareness and to spiritual life. Here all the eight limbs are constructed so that an individual develops his/her spirituality in life. The first five limbs deal with the individual’s outward actions or external practices. It is called as Bahiranga yoga. In this stage our body and mind are purified and ready for the internal purification process of Dharana, Dhyana and Samadhi. These three disciplines are more and more internally mind oriented so it is called as
Antaranga yoga. The last three stages are heightened stages of consciousness produced as a result of spiritual wisdom. Every step is just a footstep or eight limbs to reach the final eighth step.

**Yama:** Abstinence – code of character

Yama is a list of do’s and don’t (restraints) and it is the first anga of the Raja yoga. Actually it deals with the individual’s moral discipline that is the code of character. It proscribes killing, falsehood, theft and greediness during one’s life time.

**Niyama:** Observance of code of conduct

The second “anga” of Raja yoga also details some moral codes of conduct for the individual. This section is devoted to a recommendation of good things to be followed in life. Patanjali refers to them as Niyamas.

**Asana:** Posture

The third “anga” is Asana. Asana means posture. We give all possible movements to the body by aligning our body into different postures, hold on to those postures for some time and then relax the whole body. This wide range of posturing improves suppleness and flexibility in the body. Further it tones up the nervous system, function of all vital internal organs, stimulation of the glands and regulation of the blood flow. The muscles in our body are thus formed and strengthened.

**Pranayama:** Breath control

Pranayama is the fourth “anga” in Raja yoga. Pranayama means breath control. In other words it is the control of air by means of inhalation, holding
and exhalation. Pranayama is mainly used to prepare the mind for meditation.

**Benefits of Pranayama**

The practice of pranayama, the correct breathing technique, helps to manipulate our energies. Most of us breathe incorrectly, using only half of our lung capacity. Pranayama is a technique, which re-educates our breathing process, helps us to release tensions and develop a relaxed state of mind. It also balances our nervous system and encourages creative thinking. In addition, by increasing the amount of oxygen to our brain it improves mental clarity, alertness and physical well being.

When practised along with yogasanas the benefits of pranayama are more pronounced. According to Patanjali’s Yoga Sutra, pranayama enables the mind to acquire the capacity to concentrate on any given object of attention. It also says that scientific breathing helps in unveiling true knowledge from the darkness of ignorance. But it is eminently advisable to be aware of all the do’s and don’ts of pranayama before practising it.

**Pratyahara: Sense withdrawal**

The living involves the five senses that are at the disposal of our body. Self control means controlling our sense organs namely the eyes, the nose, the mouth, the ear, and the body. In pratyahara, Patanjali advocates sense withdrawal to save a yogi from sense involvement. Moha or attraction is repulsed by pratyahara. This is possible by disciplined practice of the sense organs. When one is taken away by sensation of sight, touching, hearing,
smelling and taste concentration meditation is not possible. To control sensation, pratyahara is recommended.

**Dharana:** Concentration

Dharana means concentration. Patanjali says that concentration is the fixing of the mind on something. It is a preparatory stage for next stage called Dhyana. In this stage the concentration of mind is practised by focusing our attention on a particular spot or object.

**Dhyana:** Meditation

In yoga sutra, Dhyana means the unity of the mind achieved through contemplation. Concentration results in meditation. Dhyana is a deep meditative stage in which the entire mind is fixed on an object or thought. It is done so intensely and entirely so that the mind unites with the object contemplated. It is a stage of total concentration insulated from all kinds of distractions or interruptions. Such a stage is called dhyana the seventh “anga” of Patanjali yoga.

**Samadhi:** Self Realization

Samadhi is a highly integrated consciousness, in which the person meditating the object and the act of meditation are unified into a one whole. This is such a stage in which self realization is attained.

The last three stages are connected with one another and are practised one after the other. Dharana is the first step leading to Dhyana and
Samadhi. It is the culmination stage. Put together these three stages are referred to a triple Stage of meditation namely “semyama” (Iyenkar, 2004).

1.4. PHYSICAL EXERCISE

Robert (1989) stated that physical exercise is any organized activity that involves continuous participation. Exercise occupies a leading role in keeping a person fit. It will be quite difficult to adjust one’s life to stress, diet, sleep and so on without proper exercise.

Edward (1998) concludes that the frequency related exercise extending over months and years is necessary for healthy existence. It is the physiological need of a primitive which cannot safely be eliminated by civilization. It is difficult to find men who have been injured by muscular exercise but easy to find many who have failed in normal development and ruined by the lack of it. Regular exercise offers many physiological benefits.

1.4.1. Need for physical exercise

It:

1. improves your chances of living longer
2. improves quality of life
3. reduces the risk of heart disease
4. helps lower high blood pressure (hypertension) and high cholesterol
5. helps protect you from developing certain cancers
6. helps prevent or control type 2 diabetes (adult-onset diabetes)
7. reduces the risk of arthritis and alleviates associated symptoms
8. helps prevent osteoporosis (gradual loss of bone mass/strength)
9. improves mobility and strength in later life
10. alleviates symptoms of depression and anxiety
11. helps in weight reduction and weight management.

1.4.2. Types of Exercises:

Exercise is an important component in staying healthy when you have arthritis. Moderate physical activity on a regular basis helps decrease fatigue, strengthen muscles and bones, increase flexibility and stamina, and improve your general sense of well-being. Joint flexibility is especially important when one has arthritis because stiff joints mean inability to do daily tasks, such as buttoning a shirt or starting the car.

One should commit oneself to regular exercise that includes three types of activity: flexibility (stretching, range-of-motion) exercises, strengthening (resistance) exercises and cardiovascular (aerobic) exercise. That may sound like a lot, but if incorporated into daily routine, it gets easier to do without even thinking about it.

Before one begins any exercise, he / she should consult a physician to see if the exercise is appropriate. One may even want to see a physical therapist for an assessment of one’s specific exercise and joint protection
needs. They will help learn how to get started, how to modify exercises so they don’t damage your joints and how to set reasonable goals for oneself.

Also, it must be borne in mind that only a medical professional could determine what sort of activity to do during a flare. When a joint is warm, painful and swollen, rest will help reduce the joint’s inflammation. A doctor or a physical therapist also may suggest gentle range-of-motion exercises to help maintain joint movement.

**Flexibility (Stretching, Range-of-Motion) Exercises**

These gentle stretching exercises should be done every day and are the most important of all exercises. Flexibility exercises can help protect joints by reducing the risk of joint injury, help warm-up for more strenuous exercise by getting the body moving and help relax and release tension from your body. These can be done on land or in water such as a pool, hot tub or in warm bath. These exercises can be particularly useful for easing those stiff joints in the morning. Good range-of-motion exercises include tai chi and yoga. It is ideal for one to work up to 15 minutes on flexibility exercises a day. “Once you can do 15 continuous minutes, you should be able to add strengthening and aerobic exercises to your routine” Hardayal Singh, (1991).

**Strengthening (Resistance) Exercises**

When one has arthritis, one needs strong muscles to lessen the stress on joints. Strengthening exercises can help build muscles so they can absorb shock and protect joints from injury, as well as help one get around better. These exercises use weight or resistance to make one’s muscles work harder, thereby helping them to get stronger.
There are two types of strengthening exercises: isometric and isotonic. Isometric exercises are good for people with arthritis because they work by tightening the muscles without moving the joint. It is easy to target the muscles around the joints with isometric exercises, and that reduces stress on your joints. Isotonic exercises strengthen the muscles by moving the joint; for example, straightening one’s knee while sitting in a chair is an isotonic exercise that helps strengthen the thigh muscle. These exercises can also benefit people with arthritis because they can be made easier when you have an inflamed joint or you can make them more difficult when you are feeling better by adding weights or repetitions. Strengthening exercises should be done every other day after warming up with some flexibility exercises.

**Cardiovascular (Aerobic) Exercises**

Cardiovascular (aerobic or endurance) exercise is any physical activity that uses the large muscles of the body in rhythmic, continuous motions. This includes walking, dancing, swimming and bicycling, among others. The purpose of these exercises is to make your heart, lungs, blood vessels and muscles work more efficiently. They also can result in improved endurance, stronger bones, improved sleep, controlled weight and reduced stress, depression and anxiety. One should try to include aerobic activity in one’s fitness program three to four times each week, with a goal of working on your target heart rate for 30 minutes each session. One can work up to this goal slowly; starting with as little as 5 minutes and increasing as one get stronger and more able.

If one has tried exercising before, but was unsuccessful, one should not make a mistake by trying the same way next time. He should do
something new. Pick activities he can easily work into his day or find a buddy to exercise with. Sometimes this makes the exercise more a natural part of your day or gives you someone to encourage you when you need it. You can also join an exercise group. Check your local Arthritis Foundation office to learn about exercise programs in your area.

**Effects of physical exercise on various systems:**

The purpose of this paper is to discuss the effects of exercise in one’s absolute health (mental, social, and physical health). If one is not well in one of the three parts, he is not completely healthy. Exercising is a free time activity that helps people to feel good in every aspect of the health definition.

The best known part that exercising improves is the physical part. The physical effect of exercising is that every part and system of our body is in continuous movement. There are many parts in our body that benefit from exercise, but one of the most important parts that exercising helps is the cardiovascular system. For example, when one exercises, muscles move, and to move, muscles need oxygen in the blood, so the heart has to pump blood in a faster rhythm to keep the muscles moving. This trains your heart and lungs giving you more strength for the future.

Another part of the definition of health is mental health. This is one of the aspects that makes people exercise. Exercise distracts and relaxes you for a while because in your exercise, you are discharging many feelings and commodities, such as stress. Many people feel that after exercising, all the problems and pressures of their lifestyle disappear or at least are forgotten.
for a while. While exercising, problems of our lives can be solved because one is calm and relaxed, and it is just much easier to think clearly.

The social aspect of health is also helped by exercising because many of the sports are or can be made with someone else. This makes stronger relationships because one meets people that are like him / her and share the same feelings. I think that this makes one feel more secure and learn about human relationships.

Exercising is an activity that touches the three aspects of health. By exercising one can improve the functioning of one’s body, be calm in mind, and meet new people which leads to a healthier life. I think that another benefit of exercising is the satisfaction of doing something that helps one to live healthy. This idea causes many people to think of exercise as a drug. Everyone should try it. Exercise, and be healthy.

1.5. THE IMPORTANCE OF EXERCISE TODAY

In the past, before the development of modern technology, most people's daily routine involved considerable physical activity, including walking and various kinds of labour involving bodily movement and effort. It might seem that they should not have needed additional physical exercise for the sake of their health. Yet Rambam, writing over eight hundred years ago, stated definitively: "As long as a person exercises and exerts himself a lot of illness will not come upon him and his strength will increase." Even then, Rambam saw the need to emphasize the importance of physical activity to health - which means it's even more important today!
Means of transport, sophisticated machines and electrical equipment that do our work for us at the push of a button have made our lives easier in amazing ways. But by saving us a considerable amount of physical effort, they have taken from us many natural opportunities to use and exercise our bodies. The problem is especially great among those whose daily "activity" is mostly sitting, including office workers, drivers and students. Added to the problem is today's average daily diet, which is richer than in the past, especially in fats and sugars. Inadequate physical activity and unhealthy diet are at the root of many of the health problems and illnesses with which people today are afflicted.

Today, it is more important than ever to set regular times in our daily schedule for some kind of health-promoting physical activity. The need is even greater for those of us whose day involves limited physical activity. Each one of us needs to find the right kind of activities that will help maintain and enhance bodily fitness and reduce the risks of illness.

In the wider world there is ever-growing awareness of the need for extra physical activity and a heavy investment in activities whose declared purpose is improving fitness, health-maintenance and prevention of illness. Yet in fact, the pursuit of these goals has turned into a culture of its own that puts the main emphasis on cultivation of the body and bodily appearance and its ability to derive the greatest enjoyment from life. This culture has spawned a complete industry of sports events, media coverage, advertising, fitness centers, equipment, factories, stores and so on, involving enormous sums of money.
Sport and exercise become idolatry when their essential goal is development of the body and physical fitness for the sole sake of enjoying the material pleasures of life. For Jews who keep the Torah and the Mitzvos, the true purpose of engaging in the physical activities that promote health is to make the body a fit instrument for the service of God.

1.6. **YOGA AND PHYSICAL EXERCISE**

Yoga practice is generally looked upon as exercise. It is a misconception to call yoga physical exercise. Yoga is postural patterns; these postural patterns are to be achieved slowly, maintained for sometime steadily and released again in a slow smooth manner. Yoga leads to exertion of the body, nevertheless. Yoga uses physical exercises as tools to make the body and mind healthy. The body and mind are trained in such a way that a necessary equilibrium is established in over all functions.

The aim of yoga is not only to develop the muscle and the body but mainly to regulate the proper activities of all the internal organs and glands to affect the nervous system and that which control our well being to a much greater degree than we actually suppose.

Many people consider yoga as exercise and practice it in exercise pattern keeping therapeutic use aside. If asanas are to be practiced to maintain normal health of mind and body, then they differ from physical exercise in many respects.

1. Exercises are performed in a fast or speedy manner leading to exertion and fatigue.
2. Movements of extremities are more prominent and important while exercise to the trunk is secondary in exercise.

3. In exercise, only a particular movement is repeated to develop strength of some part of the body.

4. Heavy muscle masses are built through exercise for increasing muscular strength.

5. The voluntary efforts in the stretching of muscle increases the tension in muscles and gives rise to painful sensations.

1.7. HEALTH RELATED PHYSICAL FITNESS COMPONENTS

Motor ability may be defined as present, acquired and innate ability to perform motor skills of a fundamental nature, excluding highly specialized sports or gymnastics skills, such as walking, running and jumping.

From this definition, it may be deduced that motor ability is the basic or fundamental ability of an individual to perform the basic motor tasks. The acquisition and performance of important sports skill is based on the degree of development of this ability. It is now proved that the motor ability can be developed through training which, in turn, may be utilized to improve the sports skills. The training to improve motor ability can be timed in such a way that it may help the athlete in giving his optimum performance at required time.
1.8. PHYSIOLOGICAL VARIABLES

Among the many physiological variables, the researcher has selected variables such as Resting Pulse Rate and Breath Holding Time as they play an important role in sports performance.

1.8.1. Importance of Physiology variables

In intensive care, physiological variables of the critically ill are measured and recorded in short time intervals. The proper extraction and interpretation of the essential information contained in this flood of data can hardly be done by experience alone. Typically, decision making in intensive care is based on only a few selected variables. Alternatively, for a dimension reduction, statistical latent variable techniques like principal component analysis or factor analysis can be applied. However, the interpretation of latent variables extracted by these methods may be difficult. A more refined analysis is needed to provide suitable bedside decision support.

Graphical models based on partial correlations provide information on the relationships among physiological variables that is helpful for variable selection and for identifying interpretable latent components. In a comparative study we investigate how much of the variability of the observed multivariate physiological time series can be explained by variable selection, by standard principal component analysis and by extracting latent components from groups of variables identified in a graphical model.

High level of performance of football and volley ball players might be dependent upon their physiological make up. It was recognized that physiological proficiency was needed for high-level performance. Hence
resting pulse rate and breath holding time were selected as physiological components for this investigation. For specific physiological systems of the body to be fit, they must function well enough to support the particular game the players are playing. Since different games make different demands upon the organism with respect to neurological, respiratory, circulatory and temperature functions, physiological fitness is specific to the activity, physiological systems are highly adaptive to exercise. The response of each system is distinctive, for example, hard work in the heat is necessary to improve the fitness of the temperature regulation mechanism. Each task has its major physiological components and fitness for the task requires effective functioning of appropriate systems, (Shaver, 1981).

Resting pulse rate the average resting heart rate for an adult is between 60 and 100 beats per minute, while well-conditioned athletes can achieve between 40 and 60 beats per minute. The maximum pulse rate is 220 minus your age, and the target for a healthy pulse rate during, or just after exercise, is 60-80 per cent of this.

Normal pulse rate for an adult is between 60 to 100 beats per minute resting. Pulse rate is one of the indicators of the health of your heart. The regularity of the pulse, strength of the pulse, blood pressure, and ECG readings all relate to the health of the heart. Generally, under normal circumstances, the lower the resting rate, the stronger the heart, because it means the heart is pumping so efficiently that it needs less beats to circulate the same amount of O2. (It also means your blood carries more red blood cells.)
Pulse rate is the number of beats felt exactly for a minute. The average rate of the pulse in a healthy adult is 72 beats per minute. There may be variation of up to five beats per minute within normal range, (Shaver, 1981).

**Importance of Pulse Rate:**

The pulse rate varies greatly in different people and in the same person under different situations. The American Heart Rate Association accepts as normal, a range from 50 to 100 beats per minute. Some endurance athletes with very strong and efficient hearts have rate as low as 45 beats per minute. Eugene Bannisher, the great miller, had a resting pulse rate of only 38 beats per minute. Women heart takes 5-10 beats faster than men. This is primarily due to their size. The average rate is 72 beats per minute but the rate can accelerate to 220 per minute, (Shaver, 1981).

Regular participation in endurance activity such as jogging, cycling and distance swimming can be done to reduce the pulse rate. Good Cardio respiratory condition would be indicated by pulse rate of 60 for women and 50 for men. Lesser pulse rate gives good performance for all the sports and games.

**1.9. ANTHROPOMETRIC MEASUREMENTS**

Anthropometric measurements have been a part of physical education research and evaluation since its inception. The earlier research was in the area of anthropometry was with the emphasis on changes in muscle size, brought about through exercises. (Clarke and Clarke, 1987).
Physical educators have long realized that the performance of men and women is greatly influenced by such factors of age, height, arm length, leg length and body structure.

The sculpture of Greece and Rome preserve the ideas of those civilizations concerning the idea proportions of the human figure. It is interesting to see in their sculpture the swing of the pendulum of approval from athletes who were broad shouldered, thick set square chested and very muscular, to athletes who are leaner, more supple, and whose figure are more representative of the skills of the finer coordination. Since the early times there has been continued use of anthropometric measurement to determine its relationship with performance in different games and sports.

Anthropometric variables such as weight, standing height, sitting height, foot length, fore leg length, thigh length, leg length and shoulder width are related to optimum and skilful performance in team as well as individual sport.

Physique is a factor insert of success that may lead to inclusion in the Olympic team or more negatively that lack of proper physique may make it almost impossible for an athlete to reach that degree of success. Thus sports anthropometry has emerged as a special branch not only as a parameter or selective diagnostic procedure, but also as a performance prediction tool. Sports scientists and psychologists have been of the opinion that anthropometric measurements and physical components of the athletes have a lot to do with her/his performance in any ground sport. Body measurements vary within the game as well as between the game and sport.
1.9.1. Importance of Anthropometric variables

Sports scientists and physiologists have been of the opinion that anthropometric measurements and physical components of an athlete have a lot to do with his performance.

Structure of the body is one of the related variables of human motor performance. Science of anthropometry has developed primarily in the play fields of physical anthropologists. Scientific anthropometry began with Johann Friedrich Blumenbach who laid the foundation of cardiology.

These specific measurements of limb length, circumference, breadth, build indices can reveal the relationship between the anthropometry of the athlete and his motor fitness. Measurement of body size included such descriptive inscription as height, weight, and surface area while measures of body proportion describe the relationship between height, weight and arm length, width and circumference of various body segments. It has been found that top athletes in some sports tend to have those proportions that bio mechanically aid the particular performance required, Zeigler (1988).

Human performance is a composition of many variables such as structure of the body, the specific measurements of the limb’s circumferences, breadth and body build. Since motor performance is an outcome of various variables, there may be a direct relationship between certain specific measurements and motor performance. The type of individual’s structure is an essential factor in his motor performance. Evidence of this is quite common: observe the well proportionate physique of boxers and gymnasts, the super structure of great basketball players, the
muscularity of top class football players, the wiriness of champion distance runners and massive built of shot-put and discus throwers. Therefore, anthropometric measurements of an individual player play a dominant role in high level sports performance.

1.10. OBJECTIVES OF THE STUDY

Yogic practices and physical exercises 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. Yoga acts both as a curative and preventive therapy. The very essence of yoga lies in attaining mental peace, improved concentration powers, a relaxed state of living and harmony in relationships.

Through the practice of yoga, we become aware of the interconnectedness between our emotional, mental and physical levels. Gradually this awareness leads to an understanding of the more subtle areas of existence. The ultimate goal of yoga is to make it possible for one to be able to fuse together the gross material (annamaya) and, spiritual (Pranayama) Mental (Manomaya) intellectual (Vijnanamaya) and spiritual (anandamaya) level within your being.

There are a number of studies already undertaken in yoga and physical exercises. However, no study has been conducted on the effect of yogic practices, physical exercises and the combination of both yogic practices and physical exercises on selected physical physiological and Anthropometric variables of college Men football players in Vellore, Tamil Nadu State.
To find out the effects of yogic practice, physical exercises and combination of yogic practice and physical exercise on physical physiological and anthropometric variables of college men football players in Vellore District, Tamil Nadu State and this study has been undertaken.

1.11. STATEMENT OF THE PROBLEM

The main purpose of this study is to find out the Isolated and Combined Effect of Yogic Practices and Physical Exercises on Selected Physical, Physiological and Anthropometric Variables among College Men Football players in Vellore District, Tamil Nadu State.

The second purpose of the study was to identify the superiority of the trainings on the selected variables among college men football players in Vellore District, Tamil Nadu State.

1.12. HYPOTHESIS

1) Isolated and combined effect of yogic practices would significantly influence the selected physical, physiological and anthropometric variables among college men football players.

2) The second hypothesis is that the physical exercises and yogic practices would significantly improve the selected physical, physiological and anthropometrical variables among college men football players rather than the isolated yogic practices and physical exercises.
1.13. **SIGNIFICANCE OF THE STUDY**

1. The study will help to know the level of improvement of selected physical, physiological and anthropometric variables among college men football players in Vellore District, Tamil Nadu State.

2. The study will help to know the various factors related to physical exercises and also to fix the training programme which, leads to the improvement of sports performance and physical exercises.

3. The present study will help to know and improve the status of physical exercises and to fix the training loads for the improvement of sports performance.

1.14. **DELIMITATION**

1. In this study one hundred and twenty male football players from colleges who represented inter collegiate tournaments were selected at random. Their age was between 18-25 years.

2. In this study, the following variables were selected

**Physical Variables**
- a. Speed
- b. Leg Explosive Power
- c. Agility

**Physiological Variable**
- a. Resting Pulse rate
- b. Blood Hemoglobin
c. Anaerobic power

Anthropometric Variable
a. Chest girth
b. Thigh girth
c. Calf girth

Treatment variable
a. Isolated Yoga Group
b. Isolated Physical Exercises Group
c. Combination of Yoga & Physical Exercise Group
d. Control Group

1.15. LIMITATIONS

The following uncontrollable factors associated with the study were considered as limitations of the study.

1. The uncontrollable change in climatic conditions such as atmospheric temperature, humidity and other meteorological factors during the period of experiment and the time of pre and post test were considered as limitations.

2. The growth and development of the subjects if any, during the period of experimentation, and its possible influence on the criterion variables, could not be controlled.

3. The nutrional intake of the subjects was not under the control of researcher when testing or prior to testing.
4. The quantum of physical exertion, lifestyle and physiological stress and other factors that affect the metabolic functions were also considered limitations.

1.16. DEFINITION OF THE TERMS

Speed

The capacity of an individual to perform successive movement of the same pattern at a fast rate. (Barrow and Gee, 1973)

Agility

The ability of the body or parts of the body to change direction and accurately. (Mathew, 1978)

Explosive Power

Explosive power is the ability to release maximum muscular force in the shortest time as in exerting standing broad jump (Jackson 1987).

Resting Pulse Rate

The distention of the arterial walls at the beginning of symbolic ejection of blood which is not confined to aorta but travels down the arteries as a wave followed by a wave of recoils is known as the resting pulse. For the arteries that lie close to the body such as radial artery of the wrist, the arrival of wave of distention and subsequent recoil may be felt as a pulse which is often a convenient method of counting the pulse rate (Shaver, 1981).
Blood Hemoglobin

A complex molecule found in red blood cells, which contains iron (Heme) and protein (Globin) and is capable of combining with oxygen (Fox et. al.1993).

Anaerobic Power

There is enough ATP and CP to support maximal performance for approximately 6 to 8 seconds. (Mc Ardle, et.al. 1991).

Thigh Girth

It is the point of maximal thigh circumference at the top of the thigh muscle and lowered until the greatest girth is located at right angles to the long axis of the leg. (Yobu, 1983).

Chest Circumference

Chest circumference is the maximum circumference of the chest in a relaxed state after a maximal possible exhalation and was measured to the nearest centimeter. (Yobu, 1983).

Calf girth

It measures maximum circumference of the Calf taken horizontally (Singh IP, 1990)

Yoga

Modification of minds movement is called yoga- Pathanjli or surrendering the soul with the god is yoga, (Thirumalaisamy, 1997).
Physical Exercise

Physical exercise is an organized activity that involves continuous participation. Exercise occupies a leading role in keeping a person fit. It will be quite difficult to adjust one’s life in times of stress, diet, sleep and so on without proper exercise, (Thirumalaisamy, 1997).

Anthropometry

Is the science of measuring the size and proportion of the human body (Singh IP, 1990).