CHAPTER I

INTRODUCTION

Human beings have been very creative and active in nature since evolution. The search for food and shelter was the first physical activity that necessitated in the primitive man the instinct for survival. Physical activity was the first mode of communication. It was also a means of expression, as human beings evolved culturally, emotionally and socially. As the society has become more complex during the modern age, physical activity has been recognized as an organized and supervised form of education.

The body is the temple of soul and a sound mind can be found only in a sound and healthy body. To attain the harmony of body, mind and spirit, the body must be physically fit. The future of the nation depends up on the younger generation and the health of the people is of great importance to the nation.

It is imparting knowledge to choose appropriate physical activity for personal growth, well being and pleasure in performance. Sports is one of the physical activities for conditioning, fitness and recreation.

The objective of training for competitive sport is to prepare athletes for the achievements of outstanding performance in the competition. The main task of athletic training is based mainly not only on the specific requirements of sports
competition but also on the amount of training. The requirements arising from the performance structure of individual sports are not fully consistent with training requirements. This is due to the fact that the volume and intensity of the training is varies from that of competitions. The main task of sports training consist in improving and developing personal performance factors with relation to the actual requirements of competitions in specific events.

1.1 MIDDLE AGE

According to Collins Dictionary, middle age is... usually considered to occur approximately between the ages of 40 and 60".

Middle age is the period of life beyond young adulthood but before the onset of old age. Various attempts have been made to define this age, which is around the third quarter of the average life span of human beings.

The Oxford English Dictionary gives a similar definition but with a later start point "... the period between youth and old age, about 45 to 60".

The US Census lists middle age as including both the age categories 35 to 44 and 45 to 54, while prominent social scientist, Erik Erikson, (1992) sees it ending a little later and defines middle adulthood as between 40 and 65.

Middle-aged adults often show visible signs of aging such as loss of skin elasticity and graying of the hair. Physical fitness usually wanes, with a 5–10 kg (10-20 lb) accumulation of body fat, reduction in aerobic performance and a decrease in maximal heart rate. Strength and flexibility also decrease throughout the
middle age. However, people age at different rates and there can be significant differences between individuals of the same age.

In developed countries, yearly mortality begins to increase more noticeably from age 40 onwards, mainly due to age-related health problems such as heart disease and cancer. However, the majority of middle age people in industrialized nations expect to live into old age. Life expectancy in developing countries is much lower and the risk of death at all ages is higher.

Studies conducted in the past have shown that, compared to women, a man’s life expectancy at birth is five years less, and that men have higher rates of 12 of the 15 leading causes of death.

Forgoing or delaying preventative and primary health is known to be an important contributor of poor health among the middle-aged and older individuals.

1.2 MIDDLE AGED MEN

Springer’s team (2009) found that endorsement of masculine ideals negatively influenced preventative care seeking regardless of a man's prior health, family background, marital status and an array of socio economic variables.

Even though education is known to positively impact health behaviours, it is also found to be a moderating factor. The researchers observed that highly educated men with the strongest-held masculinity beliefs were just as unlikely to obtain preventative care as men with lower levels of education.
They used a sample of 1,000 middle-aged men, drawn from a large-scale study, to review the respondents' masculinity beliefs, socio economic status (as measured by education and occupational status) and receipt of three commonly recommended annual healthcare procedures for middle-aged men: a complete exam/physical, flu shot and a prostate examination.

The researchers, however, admit that even though their study represents the first population-based analysis of masculinity and men’s preventative healthcare seeking behaviours, it is not without its limits due to the sample’s lack of age, race and educational diversity.

For middle aged men, exercise is probably the most important thing to stave off the effects of age. In this age one has got to keep moving. Apart from the obvious benefits of losing weight, and being fitter, a good regular dose of activity will keep middle aged flexible, lower stress level, enhance the mood, increase energy levels, and metabolism, increase oxygen take up strengthen the bones and improve the quality of sleep.

1.3 NEED FOR PHYSICAL ACTIVITY DURING MIDDLE AGE

Physical activity is beneficial for health, but about half of all middle-aged men in the West do not take part in regular physical activity.

Researchers in Sweden examined how changes in physical activity levels after middle age influence mortality and compared them with the effect of smoking
cessation. The study, which has been published by the British Medical Journal on its website, involved 2,205 Swedish men aged 50 in 1970-73, who were re-examined at ages 60, 70, 77, and 82 years. Data including body mass index, blood pressure, cholesterol levels, smoking status and alcohol use were recorded at each survey.

At age 50, almost half of the men reported a high level of physical activity, corresponding to at least three hours of recreational sports or heavy gardening a week. Just over a third (36%) reported medium activity, corresponding to walks and cycling, and 15% were sedentary.

Overall mortality rates were highest among sedentary men and lowest among the most active men. However, during the first five years of follow-up, the mortality rate was higher in men who had increased their level of physical activity than in men with unchanged high physical activity.

But the number of such deaths was relatively small, so the researchers have not emphasised this finding. However, after 10 years, the mortality rate in these men was reduced to the same level as men with unchanged high physical activity. This reduction in mortality was similar to the effect of cessation smoking.

After adjusting other risk factors, the researchers estimated that men who reported high levels of physical activity from age 50 were expected to live 2.3 years longer than sedentary men and 1.1 years longer than men who reported medium levels of physical activity.
Increased physical activity prolongs life among middle aged and older men, though there might be a period of 5-10 years before an effect is seen on total mortality and this effect is the same as the effect of smoking cessation.

1.4 YOGA

Yoga means the experience of oneness or unity with inner being. It is a science by which the individual approaches truth. The aim of yoga practice is to achieve truth where the individual soul identifies itself with the supreme soul or God. Yoga has the surest remedies for man’s physical as well as psychological ailments. It makes the organs of the body active in their functioning and has good effect on internal functioning of the human body. Yoga is a re-education of one’s mental process, along with the physical.

Stories and legends from ancient times testify to the existence of yoga, and to the practitioners and divinities associated with it. Indian literature is a storehouse of knowledge about yoga covering every conceivable level. Roughly in chronological order are the vocals (books of scriptural knowledge), the Upanishada (Philosophical cosmologies), and their commentaries; then the Puranas (ancient cosmologies), and the two epics, the Ramayana and the Mahabharatha. The Mahabharatha contains within itself that master piece of Indian scripture the Bagawad Gita. Towards the end of Vedic period comes the aphoristic literature, with the “yoga Aphorisms” of Patanjali of special interest to yoga students. Besides, whole bodies of works both ancient (Pre-Christian) and more modern with various aspects of yoga and
yoga philosophy, testifying to the continued relevance of yoga as a discipline (Mira Mehta, 1998).

In other systems of physical exercises, the internal organs of the body may not get proper exercises, while yogic practices give sufficient exercises to the internal organs of the body. Yoga practices have a greater impact on the mind and control the senses. Yogic practices make possible not only physical and mental development but also intellectual and spiritual development. Yoga practices are called a ‘non-violent activity’ (Sharma, 1984)

1.4.1 MEANING OF YOGA

The literal meaning of the word ‘yoga’ is yoke. It means uniting the individual spirit with the universal spirit, or God. The word ‘yoga’ is derived from the word Sanskrit ‘Yuj’ which means to join, to attach, to bind, and yoke, and to concentrate on one’s attention.

According to Gandhi, the yoking of all the powers of body, the mind, the emotion, the will which the yoga presupposes, it means pose of the soul which enables one to look at life in all its aspect evenly. In Indian culture or thought human beings or everyone on this earth is guided by the supreme universal spirit, i.e., Pramatma or God of which the individual human spirit, i.e., Jivatma is a part. Yoga is a way to secure liberation (Moksha) because it is the means by which the jivatma can be united to the pramatma.
The science of yoga works on physical, mental, emotional, psychic and spiritual aspects of a person. When imbalance is experienced at this level, the organs, muscles and the nerves no longer functions in harmony, rather they are in opposition to each other. Therefore, yoga aims at bringing the different body functions into perfect co-ordination so that they work for the good of the whole body. Yoga has a complete message for humanity. It is a message for, human soul. (Swami Kuvalayananda, 1977)

1.4.2 THE CONCEPT OF YOGA

The concept of Yoga is based on Shrimad Bhagawad Gita which is considered the greatest literature on yoga. Besides this the spiritual practitioners will be introduced to Yoga Sutras, Hatha Yoga Pradipika and Gherand Samhita. This leads to self realization and understanding the true meaning of Nirvana or Moksha, which is freedom from the cycle of births and deaths. However, there exist many misconceptions regarding the word Yoga and its practice.

Although the word ‘yoga’ has many connotations, etymologically it means, “integration: The term “Samatava” of Bhagavat Gita conveys the same meaning. Other terms like homeostasis, equilibrium, balance, harmonious development etc. more or less suggest the same things. The aim of yoga itself is an integration of personality in its all aspects. In order to help the development of such integration, various techniques are employed. These techniques or practices enjoined in yogic literature and handed down in different traditions also go under the name of yoga. (Gharote, 1982).
1.5 COMMON OBJECTIVES OF YOGA AND PHYSICAL EDUCATION

Health, physical fitness and emotional stability are the objectives which bring Yoga and Physical Education on a common platform for the benefit of the human individual. Health is a more general and comprehensive term conveying the ‘feeling of well being’, while physical fitness is a more specific term. Health and physical fitness are not static. They are always changing. They follow ‘the law of use and disuse’. Health and physical fitness can be maintained only by carefully selected physical activities which are called ‘exercise’. The utility of the particular exercise programme can be evaluated only in terms of the effects that are obtained in promoting a particular factor or factors of physical fitness. Through constant practice of yoga, one can overcome all difficulties and eradicate all weakness. Pain can be transmitted into bliss, sorrow into joys, and failure into success and sickness into perfect health. Determination, patience and persistence lead one to achieve this goal. (Amanda, 1982).

1.6 ASANA

Asana means holding the body in a particular posture to bring stability to the body and poise to the mind. The practice of asana brings purity in tubular channels, firmness to the body and vitality to the body and the mind. Asana is a state of being in which one can remain steady, calm, quiet and comfortable, physically and mentally.

Yogasanas are simple actions for keeping the internal and external parts of the body in good health. No activity can be performed well so long as the internal and
external parts of the body are not in good health. The body and the mind are closely related. The people of ancient Greece believed in the principle “A sound mind in a sound body.” By practicing asanas one possesses himself from physical disabilities and mental distractions. It is a state of complete equilibrium of body, mind and spirit.

Yogasanas are practiced to develop one’s ability to sit in one position without discomfort for extended lengths of time, as this is necessary during meditation.

1.7 PRANAYAMA

‘Pranayama’ means control and regulation of breath. “Prana” is a Sanskrit word which means ‘vital force’, “Ayana”, means the control of the Prana. So Pranayama means the control of vital force (Prana) by concentration and regulated breathing. Prana is the vital power or force which is motivating every element on the earth and is the origin of the force of thought. There is a deep affinity between prana and mental force, between mental force and intellect, between intellect and soul, and between soul and God. As wind drives smoke and impurities from the atmosphere, pranayama drives away the impurities of the body and mind.

1.8 MEDITATION

An ordinary person may consider meditation as a worship or prayer. But it is not so. Meditation means awareness; Meditation is not a technique but a way of life. Meditation means “a cessation of the thought process”. It describes a state of consciousness, when the mind is free of scattered thoughts and various patterns. Traditionally, the classical yoga tests, describe that to attain true states of meditation
one must go through several stages. After the necessary preparation of personal and social code, physical position, breath control and relaxation come to the more advanced stages of concentration and then ultimately absorption. “Watching your breath” is meditation; listening to the birds is meditation. As long as these activities are free from any other distraction to the mind, it is effective meditation.

1.9 BENEFITS OF YOGIC PRACTICES

Many world class sportsmen have found that the practice of yoga helps them to achieve greater skills in their sports. This is because yoga not only works on the physical level but also has benefits for the mental, emotional and energy levels. It enables them to realize that ‘winning is not everything’ and that there is ‘more to life’ than sporting ‘high’ and ‘lows’.

1. At the physical level asanas, kriyas, mudras and pranayama stabilize and balance the lop-sided physical drills necessary for sporting activity.

2. Yoga helps to develop all system of human body such as cardiovascular, respiratory, digestive, eliminative, endocrine, nervous and muscle-skeletal system thus strengthening, cleansing and purifying the body.

3. Yoga is isometric and internal. It is content between our inherent inertia and the power of the will. Parts of the body are pitted against one another and a unique harmony of body, mind and breath is developed. This internal struggle when handled successfully deepens the consciousness of not only the working of the body but also of mind and emotion.

5. It brings complete changes in body and mind so that the practitioner feels fresh remarkably, relaxed and full of vitality (Saraswati, 1994).

6. Yoga especially pranayama causes expansion of consciousness. This helps to attain mental clarity, awareness and creativity (Bera, 1994). As a result it improves concentration, attention, memory etc.

7. Lung functions can be improved as a result of yogic exercise (Bhole, 1982). Yoga is also useful for improving the breath holding time (Bhole, 1979).

8. Yogic exercises are beneficial in removing postural defects and physical disabilities. Yogic training is an useful therapy system in managing chronic diseases.

9. Yoga prevents as well as reduces the intensity of drug abuse and alcohol addiction by decreasing autoimmune arousal (Parker et al. 1978).

1.10 PHYSICAL EXERCISE

Fitness is a key to enjoy life. Exercise, including walking and jogging are important for a total fitness programme. Regular exercise is necessary to develop and maintain an optional level of health, performance and appearance. It makes one feel good, both physically and mentally. It gives psychological lift and strengthens a
sense of accomplishment. Looking young is a reflection of good health. Regular physical exercise enhances the function of the joints; increases the sense of physical well-being, promotes a sense of feeling good; increases physical working capacity by increasing cardio respiratory fitness, muscular strength and endurance and decreases the risk of serious diseases that could lead to early disability and death.

Ukoho (1988) expresses that exercise helps to improve health prospects in various ways. It helps to reduce body fat and overall weight and reduce blood pressure. Exercise ensures better digestion, respiration and efficient blood circulation. Proper exercise programme can reduce the probability of injuries among older people as well as back injuries among certain occupational group. Exercise tolerance is increased, risk factors are controlled and even progression and regression of coronary artery disease can be influenced by training and diet. Regular physical activity is important for maintenance of health and may lead to a better quality of life. Training has to be followed not less than two to three hours per week in at least three sessions at an intensity corresponding to 60 to 85% of maximum heart rate achieved in a symptom limited maximum exercise test. Cardiac patients at high risk should exercise at lower intensities. Exercise occupies a leading role in keeping persons fit. It will be quite difficult to adjust one’s life in term of stress, diet, sleep and so on without proper exercise. Exercise means using and tuning the body. Exercise builds and maintains physical fitness. (H.U.Niederhauser, 1996)

1.10.1 NEED AND IMPORTANCE OF PHYSICAL EXERCISE
Every individual must know the need of physical exercise. One must have fundamental knowledge of anatomy and physiology to understand physical fitness which is the capacity of a person to function steadily and smoothly when a situation arises. Physical exercises make one mentally sharp, physically comfortable and ease with his body and enable to cope with the demands that everyday life makes upon him. Increased physical fitness not only improves health but improves performance at work. Physical exercise helps one to possess a high degree of physical conditions.

1.11 WALKING

Walking is generally distinguished from running in that only one foot at a time leaves contact with the ground: for humans and other bipeds running begins when both feet are off the ground with each step.

Walking, also called ambulation is the main form of animal locomotion on land, distinguished from running and crawling. When carried out in shallow waters, it is usually described as wading and when performed over a steeply rising object or an obstacle it becomes scrambling or climbing. Walking is a very popular form of exercise today because it is suitable for every body; female, male, old and young and gives similar benefits as swimming, rowing, or aerobic dance. One walks an average of 10000 steps a day that is 4 million steps a year equivalent to 4 miles every day and approximately 1500 miles each year. Our physique is designed to walk and run. Estimates from studies over 150 species of mammals suggest that for our body weight, we are biologically meant to do the equivalent of 6 hours of walking daily. (Prevention, July 2009)
1.11.1 BENEFITS OF WALKING

In today's fast paced life, people are leading a very unhealthy lifestyle. The increasing rate of diseases, stress levels and lack or inadequate sleep are caused due to sedentary lifestyle. People get so engrossed in coming up in life that they forget their health. There is a popular saying 'If wealth is lost, something is lost, but if health is lost, everything is lost". Walking is the safest start towards exercise routine. Particularly for obese people walking is the most recommended start. To start with always stick to a comfortable speed in which you do not gasp for breath. One should never start to jog immediately; take time and seek appropriate medical advice before jogging. Walking on hills is good. The uphill provides cardiovascular benefits and the downhill is good for reducing the blood sugar levels. Walking on hills may not be possible for all due to the location constraints. This can be achieved by using some specifically made Treadmills which allow simulating the required inclination. Walking helps to burn fat, boost the energy levels and decrease health risks. Many people whose life style is sedentary or who are obese have very low fitness levels due to lack of exercise. Walking is the ideal exercise to start for these kinds of people. Walking enables to workout at a steady pace which is required to burn fat effectively. Walking can reduce the risk of many diseases like heart attack, stroke, depression, colon cancer, constipation, osteoporosis, impotence etc. and to cure sleeplessness.

1.11.2 BENEFITS OF WALKING FOR MIDDLE AGED MEN

For middle aged men, exercise is probably the most important thing to stave off the effects of age. In this age one has got to keep moving or he will seize up. Apart from the obvious benefits of losing weight, and being fitter, a good regular dose of activity will keep middle aged flexible, lower stress levels, lift the mood increase general energy levels, increase metabolism, increase oxygen uptake, strengthen the bones and improve the sleep patterns.
Heart disease is the number one killer of older men. As people get older, large arteries lose their elasticity and get stiff, causing high blood pressure and enlarging the heart. Both are serious risk factors for heart disease. After menopause, women are especially at high risk. A bit of walking -- not even brisk walking, just at a moderate pace can transform stiffening arteries into more pliable ones, like younger men have.

Walking for exercises must be comfortable brisk and sustained. The four miles covering each day within the house or office is of no aerobic value. Walking with moderate diet will result in a loss to 10 to 15 Kg fat a year. Most heart attack patients are required to start walking with in 3 days of surgery.

Walking strengthens the bones and reduces the incidence of osteoporosis. This is affected by bone loading within every step the legs and hips are impacted with the body weight. This constant gentle loading strengthens the bones making a better exercise for the aged than both swimming and cycling.

Walking just three times a week for 30 minutes can significantly increase cardio respiratory fitness. Research shows that walking improves the fitness and ability to carry out the activities of daily living like dressing, bathing grooming and personal hygiene It helps to keep the balance, to be stronger and to be more flexible

Life expectancy is also increased even for individuals suffering from obesity or high blood pressure. Walking also increases bone health, especially strengthening the hip bone, and lowering the more harmful bad low-density lipoprotein (LDL) cholesterol, and raises the more useful good high-density lipoprotein (HDL)
cholesterol. Studies have found that walking can also prevent dementia and Alzheimer's.

Regular walking can improve confidence, stamina, energy, weight control, life expectancy and reduce stress. It can also reduce the risk of coronary heart disease, strokes, diabetes, high blood pressure, bowel cancer and osteoporosis. Modern scientific studies have shown that walking, besides its physical benefits, is also beneficial for the mind improving memory skills, learning ability, concentration and abstract reasoning, as well as reducing stress and uplifting one's spirits.

1.12 JOGGING

Jogging is defined as a fitness or recreational activity that involves running at a moderate pace, often over long distance.

Jogging is a form of trotting or running at a slow or leisurely pace. The main intention is to increase fitness with less stress on the body than from faster running.

Dr. George Sheehan, a running expert, have said "the difference between a jogger and a runner is an entry blank". Others are usually more specific, defining jogging as running slower than 6 mph (10 minute per mile pace, 10 km/h, 6 min/km). (Fixx, 1977). Jogging is often used by serious runners as a means of active recovery during interval training and for warming up.. Like other types of aerobic exercise, jogging is an excellent means for improving cardiovascular health, bone density, and physical fitness

1.12.1 BENEFITS OF JOGGING
The benefits of vigorous exercise are well described. The American College of Sports Medicine Position Statement on Exercise is a document chock-full of studies proving that vigorous exercise yields plenty of health benefits. One of the major points of the position statement is that there is a dose response to exercise; that is, the more you do, or the harder you do it, the more benefit you accrue. But this point is not to discount moderate exercise. You get plenty of benefit from moderate exercise; it's just that vigorous exercise seems to accrue even more benefit. The ACSM report makes it clear that "many significant health benefits are achieved by going from a sedentary state to a minimal level of physical activity; programmes involving higher intensities or greater durations provide additional benefits. For example, it was shown in one study that individuals who ran more than 50 miles per week had significantly greater increases in HDL cholesterol and significantly greater decreases in body fat, triglyceride levels, and the risk of coronary heart disease than individuals who ran less than 10 miles per week. In addition, the long-distance runners had a nearly 50% reduction in high blood pressure and more than a 50% reduction in the use of medications to lower blood pressure and plasma cholesterol levels."

Regular jogging is sound insurance against ill health. Jogging is the clear antidote for cardiac problem. Jogging is used in cardiac rehabilitation to repair the damaged heart, by creating new capillaries (up to 50%, that is called natural bypass) that enhances the coronary circulation. Jogging utilizes the cholesterol in the blood stream as energy thereby reducing the total cholesterol.
Impact of Jogging on leg is three to four times of the body weight. Jogging is an anaerobic exercise which strengthens the heart, lungs, muscles and bones. It helps the body to make over-all improvements.

Jogging is not the same as walking. Jogging requires more muscle for the added speed, up-and-down bouncing, deeper breathing, and balancing. A beginner to exercise should begin an exercise programme with walking not jogging. The best way is to exercise gently and rest over and over. This should be done until the body is more fit and the resting heart rate gradually decreases. Then the body will be ready to begin sustained jogging. Running requires a lot of effort. It is more intense than jogging. The running speed is affected by stride length and frequency as well as total body fitness.

1.12.2 BENEFITS OF JOGGING FOR MIDDLE AGED MEN

Increased physical activity in middle age prolongs life, though it may take five to 10 years before an effect is seen. Physical activity is beneficial for health, but about half of all middle aged men in the West do not take part in regular physical activity.

Researchers in Sweden (1970-73) examined how changes in physical activity levels after middle age influence mortality and compared them with the effect of stopping smoking. The study involved 2,205 men aged 50 in 1970 and living in Uppsala, Sweden. Participants completed a survey on leisure time physical activity and were categorised into low, medium or high activity groups. Participants were re-examined at ages 60, 70, 77, and 82 years and changes in physical activity were
recorded. Other information, such as body mass index, blood pressure, cholesterol levels, smoking status and alcohol use, was also collected at each survey.

At middle age, almost half of the men reported a high level of physical activity, corresponding to at least three hours of recreational sports or heavy gardening a week. Just over one third (36%) reported medium activity, corresponding to walks and cycling, and 15% were sedentary. Overall mortality rates were highest among sedentary men and lowest among the most active men.

However, during the first five years of follow-up, the mortality rate was higher in men who had increased their level of physical activity than in men with unchanged high physical activity. But the number of such deaths was relatively small, so the researchers have not emphasised this finding. But after 10 years, the mortality rate in these men was reduced to the same level as men with unchanged high physical activity. This reduction in mortality was similar to the effect of cessation smoking.

After adjusting for other risk factors, the researchers estimate that men who reported high levels of physical activity from age 50 were expected to live 2.3 years longer than sedentary men and 1.1 years longer than men who reported medium levels of physical activity. Increased physical activity prolongs life among middle aged and older men, though there might be a period of 5-10 years before an effect is seen on total mortality, write the authors (TOI, 2009). This effect is the same as smoking cessation.
As one gets more aerobically fit, the heart will pump more blood and oxygen with each beat and the muscles will extract more oxygen. For instance, if you have 100 oxygen molecules floating around in the bloodstream, a conditioned muscle might consume 75 molecules, whereas a deconditioned muscle might only consume 30, or even fewer than that. In fact, elite distance runners can be as much as three times more efficient at consuming oxygen than sedentary individuals. Running improves the aerobic fitness by increasing the activity of enzymes and hormones that stimulate the muscles and the heart to work more efficiently.

1.13 YOGIC PRACTICES AND PHYSICAL EXERCISES

It is necessary to note that the nature of all yogic practices is psychological and physiological. The exercises emphasizing the control of mental processes directly are more psychological, whereas exercises are more physical or physiological. It is this later part of yogic practices that has become more popular and is being extensively used for the development and promotion of health and fitness. The yogic exercises in general differ from the physical. The physical exercise is repetitive in character and utilizes a lot of energy whereas yogic exercises help to conserve energy.

1. Physical exercise is repetitive in character and utilizes a lot of energy whereas yogic exercises help to conserve energy.

2. Relaxation forms the most important aspect of yogic exercise unlike physical exercises. During the practice of asana, muscles which do not support weight or which are not actively involved are relaxed. With
relaxation, the muscles return to normality after contraction and therefore yogic exercises keep the body more flexible. Physical exercises improve the circulation of blood in voluntary system, thereby resulting in better muscular development as a result of improved function of the muscles. Yogic exercises aim at improving blood circulation to the entire vital organism thus improving their function.

3. Unlike physical exercises, in yogic exercises spine has been given an important place and various exercises for the spine aim at keeping the spine flexible and joints supple.

4. Exercises influence both mind and body whereas physical exercises have their effect mainly on the body. They have more positive reaction to stress, thus minimizing its ill effects.

1.14 PHYSIOLOGY

Physiology is the science of functioning of all the organs and systems of an organism. For the physiological system of the body to be fit, they must function well enough to support the specific activity that the individual is performing. Moreover different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurologic process.

In physiology, one learn how the organs, systems, tissues, cells and molecules within cells work and how their functions are put together to maintain the internal environment. Physiology is the science dealing with the study of human body
functions. Exercise physiology is the study of how body’s structures and functions are changed as a result of exercise. It applies the concept of exercise physiology to training the athlete and enhancing the athlete’s sports performance. (Ajmer Singh, 2005)

1.5 CARDIO RESPIRATORY FITNESS

Cardio-Respiratory fitness refers to the integrated efforts of both the cardiovascular system and the respiratory System and to the ability of the circulatory and respiratory systems to supply oxygen to skeletal muscles during sustained physical activity. Regular exercise makes these systems more efficient by enlarging the heart muscle, enabling more blood to be pumped with each stroke, and increasing the number of small arteries in trained skeletal muscles, which supply more blood to working muscles. Exercise improves the respiratory system by increasing the amount of oxygen that is inhaled and distributed to body tissues.

1.15.1 BENEFITS OF CARDIO RESPIRATORY FITNESS

The heart, lungs, and all other components work together during exercise to provide us with the energy we need to sustain our particular activity. During the process of exercise the heart pumps blood out to the arteries, which act as transport mediums to deliver the nutrients (namely oxygen) to the working muscles and cells. Individuals who spend a lot of time doing cardiovascular-type training have more efficient hearts that are capable of delivering greater amounts of nourishment to working tissues with less stress placed on it. In addition to having a greater amount of
working capacity, regular aerobic-type training can help to prevent certain diseases and disorders that can impair an individual’s cardiovascular system. Cardio respiratory fitness.

- Reduces blood pressure
- Increases HDL-cholesterol
- Decreases total cholesterol
- Decreases LDL cholesterol
- Decreases body fat stores
- Increases aerobic capacity
- Decreases anxiety, depression and
- Increases stroke volume

Cardio respiratory fitness can be enhanced by doing a controlled healthy physical activity such as walking, running, cycling, swimming, rowing, jumping rope, skiing and calisthenics exercises. These kinds of activities would further increase the pulse rate and thus help to sweat out all those unwanted toxins present in the body. For the purpose of this research, the researcher selected cardio respiratory parameters, resting pulse rate and VO$_2$ max to find out the effect of isolated and combined effect of yogic exercises, walking and jogging among middle aged men.

1.15.2 RESTING PULSE RATE
Pulse is the number of heart beats per minute. Measuring the pulse can give information about health. During exercise or immediately after exercise, the pulse rate can give information about the fitness level and health. Any change from normal heart rate can indicate a medical condition. Fast pulse may signal an infection or dehydration. In emergency situations, the pulse rate can help to determine whether the patient's heart is pumping.

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 a normal range of 50 to 100 beats per minute. Resting heart rates that are consistently high and resting heart rates that are below the normal values may indicate a problem and needs medical attention. A pulse that is hard to feel may indicate blockages in the artery. These blockages are common in people with diabetes or atherosclerosis from high cholesterol. The average pulse rate in a healthy adult is 72 beats in a minute. There may be variation of up to five beats per minute within the normal range.

1.15.4 VO2 MAX

VO$_2$ max (also maximal oxygen consumption, maximal oxygen uptake or aerobic capacity) is the maximum capacity of an individual's body to transport and utilize oxygen during incremental exercise, which reflects the physical fitness of the individual. The name is derived from V - volume per time, O$_2$ - oxygen, max - maximum.
VO₂ max is expressed either as an absolute rate in liters of oxygen per minute (l/min) or as a relative rate in milliliters of oxygen per kilogram of bodyweight per minute (ml/kg/min), the latter expression is often used to compare the performance of endurance sports athletes.

“Maximal oxygen uptake (VO₂ max) is widely accepted as the single best measure of cardiovascular fitness and maximal aerobic power. Absolute values of VO₂ max are typically 40-60% higher in men than in women.” Clearly, VO₂ max varies considerably in the population, with sex being a primary determining factor in this variability.

1.16 PSYCHOLOGY

The word ‘psychology’ is derived from the Greek word ‘psycho’, which means mind or soul and ‘logs’ mean science. So the word psychology is the science of the mind and soul. Psychology is the study of human nature scientifically and rather than formulate condition. Psychology plays a major role in sports and is closely associated with psychological components.

Sports psychology is defined as the scientific study of human behaviour in sport. Like the other disciplines within sports and exercise science, sports psychology can be applied to varied skilled movement, physical activities and exercise programmes, such as corporate fitness, exercise rehabilitation and health oriented exercise programmes as well as traditional physical education and competitive athletics. (Diane L. Cell, 1972)
1.16.1 ANXIETY

Anxiety is a psychological factor which differs from arousal. It encompasses some degree of activation and an unpleasant emotional state. This form of anxiety is used to describe the combination of intensity of behaviour and directional effect or emotion.

In recent years the understanding and implementation of real relationship between the “psycho” and the “soma” in various discipline a new avenue has been opened for physical educationist to devise suitable physical education programmes to prevent and cure those disorders that appears to result from disturbances in the relationship between the “psyche” and “soma” which are usually called psychosomatic disorders. In these disorders ‘anxiety’ appears to be the root cause which may result from any of the several Psychological disorders like hate, envy and conflict. This anxiety is manifested in different forms and in varying degrees of intensity affecting the behavioural patterns of individuals.

In view of the growing importance of anxiety in the diverse fields of human activity, psychiatrists, educationists and physical educationists depend on the method of measuring individual anxiety level in most of their investigations. As accurate diagnosis and prognosis in different psychosomatic disorders depends on the exact measurement of the intensity disorders and the nature of anxiety, an investigation into the various methods of measuring anxiety.
Anxiety is both a trait and state. As a trait, anxiety is more or less permanent inborn characteristic of human personality and as a state; it is a universal, environmental phenomenon. “Anxiety is one of the important psychological factors influencing sports performance. Anxiety, a complex emotional state, may be characterized as a general fear or forbidding usually accompanied by tension. It is related to fear of failure, either real or anticipated”. (Sivaramakrishnan, 1992)

1.16.1.1 IMPORTANCE OF ANXIETY IN SPORTS AND GAMES

Anxiety plays an important role in the acquisition of motor skills as well as in athletic performance. Anxiety can either enhance or inhibit performance; whether its effect is positive or negative depends on how an individual athlete perceives the situation. People with low trait level has been known to perform better in selected motor skills than those with high or trait levels. There is also positive relationship between participants in athletic competition. A moderate level of anxiety seems best for the acquisition and performance of motor skills levels of anxiety either too high or too low tend to inhibit learning and performance. (Lewellyn and Blucker, 1974)

1.16.2 AGGRESSION

The word ‘aggression’ which is also a psychological factor comes from the Latin word “aggredi”, “agg” means toward and gradior means walk. Literally then
the word mean to toward or approach, to “move against” or to move with intent to “hurt” or “harm.”

Aggression is behaviour and action that usually seeks to inflict psychological and physical harm, either on another person or on an individual possessions or dear one. Psychologist employs two terms to denote contrasting moves for aggression. ‘Retaliatory aggression’ denotes behaviours engaged in by individual attempting to do physical or psychological harm to others. ‘Instrumental aggression’ denotes action that reflect simply trying hard and employing extreme efforts without accompanying desires to injure another person. In real world of sports, however, the two types of aggression are often inseparable and may overlap. (Silva J.M. and Wienbergs R.S, 1984)

In the contest of sports, aggression may be considered within various categories. For example, social, psychologist and sociologists studying sports have often focused their attention on hostile and aggressive behaviours of crowds and fans attending games. Aggression usually denotes that some behaviour is taking place as opposed to mere wishes on feeling. In the vernacular, however, may use aggression to denote feelings as well as actions. Various sports may be categorized according to the degree and type of aggression they reflect and can be arranged on a continuum for those in which little aggressive action may be observed.

1.16.2.1 IMPORTANCE OF AGGRESSION IN SPORTS AND GAMES
The main function of emotion is to provide mental power to physical actions. They cover all the bodily controls. As soon as a certain physical action is over or the purpose is served or the thinking is changed emotions get over, like some of elastic things. The concept is known as homeostasis. Aggression is also a time being emotion. Perhaps it might be such a status of the organism with its body mind and spirit, which make one work more enthusiastically. So the level of aggression needs to be of some specific limits.

1.16.3 SELF CONFIDENCE

Sports psychologists define self confidence as the belief that one can successfully perform. The desired behaviour might be kicking a soccer goal, staying on an exercise regimen, recovering from a knee injury, serving an ace, or hitting a home run. But the common factor is that one believes that he will get the job done.

It is important to make a final comment about defining self confidence. Specifically, some evolving and recent research (Realey and Knight, 2002) has revealed that like many other current personality constructs, self confidence may be multi dimensional, consisting of several aspects. Specifically, there appear to be several aspects of self confidence within sport which includes.

- Confidence about one’s ability to execute physical skill
- Confidence about one’s ability to utilize psychological skill (e.g. imagery, self-talk).
- Confidence in one’s level of physical fitness and training status
Confidence in one’s learning potential or ability to improve one’s skill

(Robert S. Weinbergh and Deniel Gould, 1995)

1.17 OBJECTIVES OF THE STUDY

Psychological and physiological factors play a dominant role in addition to the physical fitness for the best sports performance. Each sport requires a predominant psychological and physiological quality which helps to win competitions. Though a number of studies have been undertaken on psychological and physiological factors, no attempt has been made to find out the effects of yogic practices and combined effects of yogic practices, walking and jogging on selected cardio respiratory and psychological variables among middle aged men. Further it is found from the research that physical exercises in the form of walking and jogging and yogic practices can improve psychological and physiological quality of middle aged men, which is needed for a healthy life. Keeping the above facts in mind the investigator has chosen this study.

Among the many other psychological variables, the researcher has selected variables such as anxiety, aggression and self confidence. Among the many other cardio respiratory variables, the researcher has chosen variables such as resting pulse rate, and VO₂ max. All these variables have direct bearing due to isolated and combined effects of yogic practices and physical exercises such as walking and jogging. Hence, the investigator selected these variables for the research.
Researches show that the yogic practices significantly improve physiological and psychological factors and there are researches to prove that walking and jogging significantly influence the selected psychological and physiological variables.

The objective of this study is to compare the isolated and combined effect of yogic practices, walking and jogging on selected cardio respiratory variables and psychological variables.

1.18 STATEMENT OF THE PROBLEM

The purpose of the study is to find out the isolated and combined effects of selected yogic practices, walking and jogging on selected cardio respiratory and psychological variables among middle aged men.

1.19 HYPOTHESES

To aid the findings of this study, the following hypotheses were formulated:

1. It is hypothesized that isolated and combined effects of yogic practices, walking and jogging would significantly alter selected cardio respiratory variables, resting pulse rate, peak expiratory rate and VO₂ max of the middle aged men compared to control group.

2. It is hypothesized that isolated and combined effects of yogic practices, walking and jogging would significantly alter selected psychological variables anxiety, aggression and self confidence level of middle aged men as compared to control group.
3. It is hypothesized that among the experimental treatments, namely isolated and combined groups, combined groups would be significantly better than isolated groups in altering selected cardio respiratory variables.

4. It is hypothesized that among the experimental treatments, namely isolated and combined groups, combined groups would be significantly better than isolated groups in altering selected psychological variables.

1.20 SIGNIFICANCE OF THE STUDY

In recent years physical educationists, sports psychologists and sports scientists have started realizing the importance of introducing yoga in the center of learning. Middle aged men along with their life style activities, show more interest in keeping themselves fit and involve themselves in different fitness activities. The significance of study is based on the fact that yoga can be a valuable tool to improve the physiological and psychological capacities. The importance of the study are as follows.

1. The findings of the study may be a reliable source to the Fitness promoters, Physical Education teachers and Coaches to highlight the importance of yogic practices for the improvement of cardio respiratory and psychological variables.

2. The results of the study would enhance the awareness of yogic exercises among the middle aged men, as yogic exercise provide more benefits in
reducing the anxiety and aggression level and in increasing the self confidence level.

3. The study will reveal the extent to which the yoga practices and walking and jogging will help to improve the performance on selected physiological variables among middle aged men.

4. The findings of the study may help the individuals to compare and contrast the changes that occur in selected physiological and psychological variables before and after the specific training programme among middle aged men.
1.21 DELIMITATION

The study was delimited to the following:

1. This study was conducted among 150 randomly selected middle aged men from different walks of life in Perinthalmanna, Malappuram District in Kerala State.

2. The age groups of the selected subjects were between 40 to 50 years.

3. The study was restricted to the following dependent and independent variables:

**Dependent Variables**

Cardio respiratory Variables

1. Resting Pulse rate

2. VO$_2$ max

Psychological Variables

1. Anxiety

2. Aggression

3. Self-confidence

**Independent Variables**
1. Twenty four weeks of yogic practices

2. Twenty four weeks of walking

3. Twenty four weeks of jogging

4. Twenty four weeks of combined yogic practices and walking and jogging

1.22 LIMITATIONS

This study was limited to the following aspects and these limitations have to be taken into consideration.

1. Socio-economic and cultural status of the subjects.

2. Factors like nutrients, heredity, environment, life style and habits.

3. The height and weight of the subjects.

4. The previous training of the subjects in physical activities, sports training and participations that would have certain effect on their physical, physiological and psychological variables.

5. Heredity which may contribute to physical, physiological and psychological efficiency.

6. Diet, general activity and levels of motivation of the subjects are beyond the control of the researcher.
1.23 DEFINITION OF THE TERMS

1.23.1 Yoga

Yoga is a way of life which can be practiced by any human being regardless of age and condition of health. Yoga is a gaining process of control over the mind. (Sharma, 1984)

1.23.2 Walking

Walking is defined as “move at a regular and fairly slow pace by lifting and setting down each foot in turn, never having both feet off the ground at once.” (www.wikipedia.com)

1.23.3 Jogging

Run at a steady gentle pace, especially on a regular basis as a form of physical exercise. (www.wikipedia.com)

1.23.4 Walking and Jogging

Walking and jogging improve the circulation of voluntary system, thereby resulting in better muscular development as a result of improved function of the muscles. (www.wikipedia.com)

1.23.5 Yogasana Exercises
Yogic exercises are form of physical exercises. They involve stretching and contracting of part of body in a specific sequence. Yogic exercise mainly meant to the development of physical, mental and vital components of men. (Gharote, 1982)

1.23.6 Asana

Asana means holding the body in a particular posture to bring stability to the body and poise to the mind. The practices of asana bring purity in tabular channels firmness to the body and vitality to the body and the mind. (Sharma, 1984)

1.23.7 Pranayama

Pranayama means control and regulation of breath. “Prana” is a Sanskrit work which means ‘Vital force”, “Ayana” means the control of the prana, so Pranayama means the control of the vital force (Prana) by concentration and regulated breathing. (Gharote, 1982)

1.23.8 Anxiety

Anxiety is complex emotional state characterized by a general fear of fore bonding usually accompanied by tension. It often has to do with inter personal relation social situation and feeling of rejection and insecurity. (Lewelly and Blucker, 1979).
1.23.9 Aggression

Hostile or violent behavior or attitudes toward another; readiness to attack or confront. Accidental harm is not aggression, but acts that are intended to injure others are aggression, whether or not they are successful. (Lewelly and Blucker, 1979).

1.23.10 Self Confidence

Self confidence as the belief that one can successfully perform a desired behaviour. The desired behaviour might be kicking a soccer goal, staying in an exercise regime, recovering from a knee injury, serving an ace. But the common factor is that one believes that he will get the job done. (Albert V.Carvon, 1980)

1.23.11 Physiology

Physiology is the study of the functions of the normal human body. (Fox and Mathews, 1981)

1.23.12 $VO_2$ Max

$VO_2$ max is the maximal oxygen uptake or the maximum volume of oxygen that can be utilized in one minute during maximal or exhaustive exercise. It is measured as milliliters of oxygen used in one minute per kilogram of body weight. (Morehouse and Miller, 1967).
1.23.13 Resting Pulse Rate

The number of times a walker's heart beats per minute while at complete rest. Resting heart rate will decrease as the walker's heart becomes larger and stronger with training. (Eva Lurie Weinerb, 1984).