

CHAPTER - I

INTRODUCTION

Modern world is the outcome of many scientific inventions through centuries. Scientific instruments and machinery have helped to lead the daily life of people with ease and comfort. The modern man depends mostly upon the scientific gadgets for his / her daily routine, involving mainly their mental powers to have a comfortable life, resulting in fall and deterioration in physical health and capacity. So the human has become less vigorous and less active. The inactivity and pressure of work result in rising stress, which is one of the rising problems in the urban areas.

In the twenty first century man is not even a chip of the giants that bestrode the world till the end of the last century. Added to the woeful inadequacy of level of physical exercises, the mental stress is on the increase. As the world is shrinking into a global village due to the advancement of net working facilities besides being highly competitive, the man has to live in mental stress that takes a heavy toll on health. So, for a human being they have to be fit, resorted to physical exercises, besides taking advantages of yoga practices in order to rest his / her over worked mind.

The word “yoga” comes from the Sanskrit root ‘yuj’, which means ‘union’. In the spiritual sense, ‘yoga’ means ‘union of the mind’ with the divine intelligence of the universe. Yoga aims through its practices to liberate a human being from the conflicts of duality (body–mind), which exists in every living thing and from the influence of the gunas, the qualities of universal energy that is present in every physical thing.

Yoga has become increasingly popular in western cultures as a means of exercise and fitness training, Over the last 10 years, a growing number of research studies have shown that the practice of hatha yoga can improve

strength and flexibility, and may help control the physiological variables such as blood pressure, respiration, heart rate, and metabolic rate etc., to improve overall exercise capacity of body.

As man is a physical, mental and spiritual being, yoga helps to promote a balanced development of all the above qualities. Physical exercises, aerobics and other forms of exercises assure welfare only to the physical body. It is quoted in the Bhagavad-Gita that, “A person is said to have achieved yoga, the union with the ‘Self’, when the perfectly disciplined mind gets freedom from all desires, and becomes absorbed in the ‘Self’ alone”. Therefore in daily life, yoga helps the person to attain a relaxed state of mind. It provides with vitality, vigor and zest to carry out the individuals’ daily life. All negative blocks in the mind are eliminated so that the body is cleansed of all the impurities and toxins.

1.1 HISTORY OF YOGA

Yoga is an ancient science. It is the oldest discipline in existence and very ancient system that originated in India as early as 5000 years or even perhaps earlier. Legends say it began with the God Lord Shiva who is described as the first great yogi. The sense of oneness of all things to the ‘Yoking’ or ‘Union’ is implied in the word yoga, which has long rich history and divided into five main periods of innovation and development such as:

1.1.1 VEDIC PERIOD

In Sanskrit, the word ‘Veda’ means ‘knowledge’. The four Vedic hymnodies are the Rigveda (knowledge of praise), the Yajur Veda (Knowledge of Sacrifice), Sama Veda (Knowledge of Chants) and Atharvana Veda (Knowledge of Atharvan or Fire). The second text contains the sacrifices accompanying the chants. The third hymnody is filled with magical incarnations for all occasions, but also includes a number of very powerful

philosophical hymns. It is connected with Atharvan, a famous fire priest who is remembered for having been a master of magical rituals.

1.1.2 PRE CLASSICAL PERIOD

This category covers an extension period of approximately 2,000 years until the second century. Pre classical yoga comes in various forms and disguises and comprises of many schools, whose teachings can be found in Indian's two epics, the Ramayana and the Mahabharata (In which the Bhagavad Gita is embedded and which is seven times the size of the Iliad and Odyssey combined). These various pre classical schools developed all kinds of techniques for achieving deep meditation through which yogis and yogin can transcend the body, mind and discover their true nature.

1.1.3 CLASSICAL PERIOD

This label applies to the eightfold yoga also known as “Astanga yoga” or “Raja yoga” taught by Patanjali's yoga sutras. ‘Patanjali’ is known as “The father of yoga”, He first summarized and systematized yoga around the second century A.D. He has formed a number of yoga sutras regarding yoga and believed that each individual is a composite of matter (Prakriti) and spirit (Purusha). He understood the process of yoga to bring about their separation, thereby restoring the spirit in its absolute purity.

1.1.4 POST CLASSICAL PERIOD

All types of schools and yoga have sprung up in this period after Patanjali's yoga sutras, which are independent of this decisive work. In contrast to classical yoga, post classical yoga affirms the ultimate unity of everything. This is the core teaching of Vedanta, the philosophical system based on the teachings of the Upanishads.

1.1.5 MODERN PERIOD

During these periods Hatha yoga was strongly promoted in India. T. Krishnamacharya travelled through the length and breadth of India giving demonstration of yoga poses and produced three students to continue his legacy in order to increase the popularity of Hatha yoga.

1.2 NATURE OF YOGA

Yoga is ‘Training in the technique of harmony and is a preparation for the total integration of human personality’. It is accepted that the influence of the body is far more profound than that of the mind. It is a way to attain salvation and to get self freedom from the cycle of birth and death. Its main purpose is the elimination of forces harmful to the soul.

Patanjali states that ‘the aim of yoga is the complete control or arrest of the fluctuations and modification of the mind’ It is a complete process of perfection of man by developing his personalities so that the person may reach their ultimate goals, thereby fulfilling the purpose of birth. (**Yogairaj, 1994**).

1.3 TYPES OF YOGA

According to the scriptures, yoga is mainly classified into various systems or branches. They are:

1.3.1 HATHA YOGA (UNION BY BODILY MASTERY AND PRINCIPALLY OF BREATH)

Hatha yoga brings a union of what is called the sun and the moon in our body. The moon is situated in the region above the hard palates and is believed to exclude a fluid that percolates and is swallowed by the sun that is situated at the navel. Hatha in short, is a way of tackling these two, that is, sun

and moon in our body (i.e.) the union of both. The principles of hatha yoga lead to specific structural poses and other activities that help the body and mind ‘Purification’ through asanas (postures) and pranayama (sahtle energy control).

1.3.2 JNANA YOGA (UNION BY KNOWLEDGE)

Jnana yoga or the path of wisdom is the most difficult, because it requires tremendous moral and intellectual strength. This yoga enquires about the nature of everything through discrimination and determination. The intellect services as an instrument to discriminate between the real and the unreal, thus leading to a realization of the real. The method of this path is to remove Maya, the evil of ignorance, by discrimination and thereby be free and illumined.

1.3.3 BHAKTI YOGA (UNION BY LOVE AND DEVOTION)

Bhakti yoga is based on the conviction that there exist a higher power called God, who has willfully created the universe is all powerful and merciful, who may shower grace and mercy on the devotee, thereby protecting man from all harms and evils. All that the devotees, is expected to do is to make himself fit for obtaining the grace and mercy of god, the supreme creator, through devotion and practice of the virtue.

1.3.4 KARMA YOGA (UNION BY ACTION AND SERVICE)

Karma in Sanskrit means ‘action’ and this yoga derives its name from the fact that even after attainment of the goal of yoga; one does not renounce the various acts. A Karma yogi behaves with a difference, which is the product of cessation of desire and an awareness of the real significance that is happening in their world.

1.3.5 RAJA YOGA (UNION BY MENTAL MASTERY THE PATH OF WILL)

The word 'Raja' means 'King'. It is divided into two groups of which the first group is Bahiranga yoga consisting of Yama, Niyama, Asanas and Pranayama. The second group is inner yoga called Antharanga yoga includes Pratyahava, Dharana, Dhyana and Samadhi. To make the mind work and to experience the full mind from the initial state of sensory withdrawal to the state of Samadhi, is unity of all the facilities of mind. This is a mental process of observation, analysis, reflection, contemplation meditation and achievement.

1.3.6 MANTRA YOGA (UNION BY VOICE AND SOUND)

Mantra yoga is the force which helps in freeing the mind by utilizing a second vibration, which liberates the mind from bondage. The mind or mental nature has two attributes, variety 'mala' and 'Vikshepa' which hold it in bondage. The 'mala' means impurities and the second is 'Vikshepa' meaning dissipation. The mind vibrates, because it wants to amuse itself. The purpose of mantra is to take the mind from worldly attraction.

1.3.7 YANTRA YOGA (VISION AND FORM)

Yantra yoga focuses the mind and encourages the clarity of conception. The conception instrument is a geometric design used for concentration, ritual or as an amulet. The prefix 'yan' means to conceive, perceive, imagine, visualize and the suffix 'tra' equals an 'instrument or tool'

1.3.8 LAYA AND KUNDALINI YOGA (UNION BY AROUSAL OF LATENT PSYCHIC)

This yoga with the experiences of the psychic body and also with the various expressions of combining and harmonizing those expressions with the manifestation of energy, the term “Kundalini” implies “coiled up” as a serpent coils up in sleep. The excitements of all chakras always take place through “Kundalini”.

1.4 STAGES OF YOGA

1.4.1 ASHTANGA YOGA

‘Astha’ means eight and ‘anga’ means limbs/ parts in the eight limbs of yoga. “Patanjali” systematized the Ashtanga yoga around the 2nd century A.D. The eight limbs of Ashtanga yoga are called as stages of yoga and described as follows:

Yama	-	‘Control’
Niyama	-	‘Culture’
Asana	-	‘Posture’
Pranayama	-	‘Science of breathing’
Pratyahara	-	‘Withdrawal of Senses’
Dharana	-	‘Concentration’
Dhyana	-	‘Meditation’
Samadhi	-	‘The final attainment’

1.4.2 YAMA: ABSTINENCE – CODE OF CHARACTER

Yama is a list of do’s and don’ts (restraints) and it is the first anga of the Raja yoga. It actually deals with the individual’s moral discipline that is

the code of character. It prescribes killing, falsehood, theft and greediness during one's life time.

1.4.3 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 such as purity, continment, austerity, self study, and devotion to God to be followed in life.

1.4.4 ASANA: POSTURE

The third 'anga' is Asana. 'Asana' means 'posture'. It gives all possible movements to the body by aligning them into different postures. Hold on to these 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, functions of all vital organs, stimulates the glands and regulates the blood flow. The muscles in our body are thus strengthened.

1.4.5 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.

1.4.6 PRATYAHARA: SENSE WITHDRAWAL

These anga involves the five senses that are at the disposal of our body. 'Controlling our sense organs' means 'Self control' namely the eyes, the nose, the mouth, the ear, and the body. This is possible by disciplined practice of the sense organs.

1.4.7 DHARANA: CONCENTRATION

‘Dharana’ means ‘concentration’. That is the fixing of the mind on something. It is a preparatory stage for Dhyana. In this stage the concentration of mind is practiced by focusing our attention on a particular spot or object.

1.4.8 DHYANA: MEDITATION

‘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. This is a stage of total concentration insulated from all kinds of distractions or interruptions, This is called ‘dhyana’ the seventh ‘anga’ of Patanjali yoga.

1.4.9 SAMADHI: SELF REALIZATION

Samadhi is a highly integrated consciousness, in which the person meditates the object and the act of meditation are unified into a one whole. The last three stages are connected with one another in which dharana is the first step leading to dhyana and samadhi called culmination stage. These three stages are referred to a triple stage of meditation namely “Semyama” **(Iyenkar, 2004)**.

1.5 ASANA

‘Asana’ means a ‘Posture’ or a ‘Stance’. Asana is the third stage of Ashtanga yoga. Legends say that asana was originated from Lord Shiva. Who assumed different stances or asana to create different forms of life. Each time were he performed an asana a new creature was born. As he did 84,000,000 asanas, 84,000,000 living species came into existence. While many

asanas represent living things such as a tree, a fish or a crane and also is derived from other sources such as mountain or the moon.

The asana aims to keep both the mind and body in perfect health through exercise. They are not only bodybuilding exercises, more than that, they increase the mental powers. It helps the body to acquire more resistance power to keep the diseases away and there by the body becomes more flexible. It reduces fatigue and smoothens the nerves besides helping to remove impurities from the body. By practicing asana, the circulation, respiration and digestion are improved as well. Asana also improves the memory, concentration and will power. Therefore it becomes, invaluable for the health of human body.

Asanas are simple actions for keeping the internal and external organs of the body, in good health state of complete equilibrium of body, mind and spirit. The body and mind are closely related. The people of ancient Greece believed in the principle, “A sound mind in a sound body”. By practicing asanas, one frees himself from physical disabilities and mental distractions.

1.5.1 OBJECTIVES OF ASANAS

- It improves posture.
- It increases the intake of oxygen.
- It increases the function of respiratory system, circulatory system, digestive, nervous, endocrine, reproductive and excretory systems.
- Its effect on the emotion is equally beneficial by calming the mind at tuning one to the environment and dimension insomnia caused by mental restlessness.

- It is highly recommended for people of all ages who work in, stressful working environment, for those suffering from head ache, back and shoulder allergies and asthma.
- It also cures behavioral disorders, nervous breakdown and maniac depression.
- To enable people to have good health.
- To practice mental hygiene.
- To process emotional stability.
- To attain a higher level of consciousness through positive experiences, leading to higher truth.
- To attain spiritual and recreational values.

1.5.2 IMPORTANCE OF ASANAS

- Asanas give sufficient exercise to the internal organs of the body. This helps an individual to maintain good health and longevity of life.
- Asanas develops physical and mental powers, to calm the mind and control the senses.
- Asanas helps the body to acquire more power to keep away diseases.
- The body becomes more flexible.
- One looks younger in age and lives longer.
- The bloods in the blood vessels are purified through asanas.
- The power of concentration and expansion of the lungs are increased by practicing asanas and these results in the purification of blood.
- Asanas keep the spinal cord flexible.

- Asanas are a non violent activity through which a person becomes morally good.
- Asanas stimulate different glands of the body, which help to acquire a well balanced growth.
- By practicing asanas disease like constipation, gas trouble, diabetics, blood pressure, and headache can be cured.
- Asanas make not only physical and mental development possible, but also help in the intellectual and spiritual development.
- Asanas reduce fatigue and smoothens the nerves.

1.5.3 RULES FOR ASANAS

- Asanas should be practiced on mat/carpet.
- Early morning is the ideal time for practicing asanas.
- Clothing should be in accordance with the season.
- The concentration should be on breathing and on the limbs that have a stress or strain.
- No force/Jerk should be exerted during the practice of asanas.
- There should be a gradual increase in the time duration while doing practice.
- It deals with the internal and external parts of the body.
- One should take light food/empty stomach before practicing asanas.
- Those who are suffering from any complicated diseases, should not practice asanas.

- Women should not practice complicated asanas after conception and immediately after delivery.
- Faster/quickness in coming to the final position from the starting position and vice-versa should be avoided.
- Savasana should be performed at the end of the session in order to get speedy relaxation of the body and to be energetic.

1.6 YOGIC PRACTICES RECHARGE THE BODY WITH COSMIC ENERGY

- Attainment of perfect equilibrium and harmony.
- Promotes self- healing.
- Removes negative blocks from the mind and toxins from the body.
- Enhances Personal power.
- Increases self-awareness.
- Helps in attention focus and concentration, especially important for children.
- Reduces stress and tension in the physical body by activating the parasympathetic nervous system.
- Thus, Yoga bestows upon every aspirant the powers to control body and mind.

1.7 BENEFITS OF YOGA

The art of practicing yoga helps in controlling an individual's mind, body and soul. It brings together physical and mental disciplines to achieve a peaceful body and mind; it helps to manage stress and anxiety and keep

relaxing, besides increasing flexibility, muscle strength and body tone. It improves respiration, energy and vitality. The most important benefit of yoga is physical and mental therapy and the aging process, which is largely an artificial condition, caused mainly by autointoxication or self-poisoning which can be slowed down by practicing yoga. By keeping the body clean, flexible and well lubricated, we can significantly reduce the catabolic process of cell deterioration.

Regular practice of the stretches, twists, bends, and inversions - the basic movements of yoga poses - restores strength and stamina to the body. Poses together with the control of breath, rectify physical, physiological, and psychological disorders.

Asanas are based on the three basic human postures of standing, sitting and lying down. But they are not a series of movements to be followed mechanically. They have a logic, which must be fully comprehended if the pose is to be practiced correctly. The end result of each pose is achieved when all the parts of the body are positioned correctly, with full understanding of the foundations.

1.7.1 PRANAYAMA

“Pranayama” means “breathe control”. There are three important movements in pranayama such as “inhalation of breath”, exhalation of breath and “retention of breath”.

In Sanskrit ‘prana’ means “breath” and ‘ayama’ means a ‘pause’. Pranayama means a pause in the movement of breath or the rhythmical exercises which consist of lung motions, nerve currents and mind functions.

In yogic literature pranayama is called kumbhaka. Pranayama is a yogic exercise in respiration which consists of alternate expansion and

contraction of thorax by means of air is drawn into or expelled from the lungs. Pranayama can be dealt with the following three heads:

1. Pranayama is a physical and mental exercise.
2. Pranayama purifies the body, nadis and mind.
3. Pranayama is a healer of diseases.

1.7.2 IMPORTANCE OF PRANAYAMA

- During a normal inhalation, an average performer takes in about 500 cubic centimetres of air. During deep inhalation, the intake of air is about six times greater amounting to almost 3000 cubic centimetres. The practice of pranayama increases the sadhaka's lungs to achieve optimum ventilation.
- Pranayama helps to cleanse the nadis, through which energy flows. There are several thousands of nadis in the body and most of them start from the areas of heart and the navel. Pranayama keeps the nadis in a healthy condition and prevents their delay by regular practices.
- Pranayama also develops a steady mind, strong will power and sound judgement.
- Pranayama affects the rhythmic expansion of lungs, thus creating proper circulation of the blood hinds within the kidney, stomach, spleen, intestines, and other organs as well as the surface of the skin.
- The lungs are directly connected with the disposal of carbon- di -oxide in the venous blood and prevent ammonia ketones and aromatic amines from building up to the toxic level. The lungs need to be kept clear and free from acterial diseases by an efficient circulation of blood and

lymph. Pranayama helps by keeping the lungs pause and by increasing the flow of fresh blood.

- Panayama helps to maintain the flow of pure blood, to the brain, spinal cord and cardiac muscles, thus maintaining their efficiency.

1.8 YOGA AND SPORTS

Yoga postures are the physical positions that coordinate breath with movement and with holding the position to stretch and strengthen different parts of the body. Asana practice is the ideal complement to other forms of exercise, especially running, cycling and strength training, as the postures systematically makes work all the major muscle groups, including the back, neck, shoulders, deep abdominal, hip and buttocks muscles and even ankles, feet, wrists and hands.

By their very nature, asanas affect major and minor muscle groups and organs as they simultaneously impact strength, increase flexibility and bring nourishment to internal organs. Although most poses are not aerobic in nature, they do in fact send oxygen to the cells in the body by way of conscious deep breathing and sustained stretching and contraction of different muscle groups.

Whatever sport one choose to practice, yoga can enhance and complement the ability. Most sports build muscular strength and stamina, often in specific areas of the body. Yoga can help to check any imbalance in muscular development and will enable both the body and the mind to function more efficiently. If the body is flexible and supple, we will be less prone to sports injuries, as the joints will be kept lubricated. Yoga makes our limbs strong balanced, enhances mental alartness which is the basic requirement of any sports/event.

Yoga asanas also strengthens weak areas of the body and ease muscular tension. The standing poses improves balance and muscle flexibility.

Gentle stretching exercises of asana ease stiffness in the legs and shoulders and improve flexibility.

Strenuous sports often involve intense physical effort. Yoga practice can help players to relax and replenish their energy after strenuous games. It does promotes calm, clear thinking, even in situations that call for fast reactions besides increasing joint mobility which in turn augments the range of motion (<http://www.yogaforbeginners.com/html/benefits01.htm>, March, 2011).

1.9 YOGA FOR BASKETBALL PLAYERS

Basketball is a total body and mind sport that requires one to be both physically and mentally quick. Successful players not only need to know how to dribble, pass, catch, and shoot while galloping up and down in the court, but also how to keep constant track of four other teammates all this while five opponents try to steal the ball. Even a basic act like shooting can be complicated. Different motions is required for a lay-up, free throw, and jump shot.

Every basketball player desires to perform at their highest possible level. A well-rounded yoga routine promotes dynamic flexibility, core stabilization, muscular endurance, proper breathing and balance work. These activities are required for any vigorous action. By focusing on these vital elements, yoga can be a great thing to do, to recover from a series of tough workouts. Some of the most popular yoga movements directly improve the range of motion at joints which helps to stay on the court longer and move more fluently, along with its emphasis on breathing and relaxation which really boost the mental energy, focus and concentration.

Here are some more benefits of adding yoga to training routine.

1.9.1 INJURY REDUCTION

Basketball players put extreme stress on their bodies during practices, matches and tournaments. The repetitive overuse of certain muscle groups will cause imbalances, where one muscle is overactive and its complimentary muscles are underactive and tighter muscles pull specific joints out of alignment. The best players sometimes get nagging injuries in major muscles and joints due to overcompensating in the inflexible area of the body. Yoga is designed to put the body in specific positions and postures that lengthen the tight muscles (usually the hip flexors, low back, quads) and strengthen the more unused muscles (gluts, abs, rhomboids) for building safe and athletic movement.

1.10 YOGA AND BALANCE

Yoga helps to balance the body by placing special attention to symmetry. If an ankle is tighter than the other, then one can't quite squat as deep on one side compared to the other, which leads to a less than optimal vertical jump and a terrible habit of favoring the stronger side during fast-paced game play. This builds mind-body connection, which makes to become one aware of the asymmetries of the movements and work to balance them out in the several challenging poses. The increased symmetry can help a player to be stronger on the court with more confidence, equal abilities to use the right and left sides of the body, and less risk for injury.

1.11 RECOVERY TIME

Yoga is a great method for injury recovery, but also helps with post-workout recovery time. Practicing a game players often have sore, energy-depleted muscles. After a vigorous workout, practice or game, yoga can help

move energy through the body and relieve what could have been several days of muscle soreness.

1.12 TRAINING

Training is a systematic process of repetitive and progressive exercise or work involving learning process and acclimatization. The word 'training' is used in the broad sense and its meaning varies with the field of application. In sports, the word training is generally understood to be a synonym of doing physical exercises. Its narrow sense, training in doing physical exercises for the improvement of performance. (Arnheim, 1985).

1.12.1 AIM AND OBJECTIVES OF SPORTS TRAINING

The aim of competitive sports training is to prepare the sports person for the attaining of the highest possible sports performance in a competition.

The objectives are;

- Personality development.
- Physical fitness development.
- Skill or technique development.
- Tactical development.
- Mental development.

1.13 TYPES OF SPORTS TRAINING

Success in competitive sports and games can be attributed to many factors of which training is the most important factor. Different training methods have been commonly used to improve the physical fitness and its related standards of the performance of the players. The training methods include interval training, fartlek training, resistance training, altitude training,

yogic practices, hypoxic training, plyometric training, aerobic and anaerobic training, continuous and alternative face running etc.

1.14 PURPOSE OF SPORTS TRAINING

Physical training brings about local changes in the muscles, improved neuromuscular co-ordination activities and series of more general cardio respiratory changes as mentioned below:

- An increase of maximum respiratory minute volume.
- Possibility of a slight increase in the oxygen diffusing capacity.
- A 10-30 percent increase in the maximum oxygen intake.
- An increase in the stroke volume and a maximum cardiac output.
- An increase in the size of the heart.
- An increase in the total hemoglobin and global volume.

1.15 AEROBIC TRAINING

According to **William sen (1998)** a system of physical conditioning designed to enhance circulatory and respiratory efficiency that involves vigorous, sustained exercise such as jogging, swimming or cycling.

Training primarily in an aerobic zone most efficiently improves aerobic capacity, trains the body to utilize fat for energy, reduces injury, improves recovery and prepares the person better for higher performance.

1.16 HISTORY OF AEROBIC TRAINING

Kenneth H. Cooper, a physician at the San Antonio Air Force Hospital in Texas, devised a form of exercise called Aerobics that helped to prevent coronary artery disease. These exercises were initially invented for astronauts

and they were carefully monitored for pulse rate and oxygen consumption. Later, it was observed that these types of exercises were also useful for the general population and thus came into practice in different forms such as dance aerobics, step aerobics, water aerobics etc.

Cooper published a book called 'Aerobics' in the year 1968. It included scientific exercise programs using running, walking, swimming and bicycling. This book became an instant success as it came at a time when the American populations were starting to face the ill effects off the sedentary lifestyle due to the advent of the many comforts that technology provided.

During the next two decades, aerobic dance and exercises in various forms spread throughout the United States and to other countries. Howard and Karen Schwartz organized in the year 1983 Sport Fitness International (SFI) to oversee a new competitive sport they had developed, known as sport aerobics. The first world championship was held at San Diego in March 1990 with athletes competing from 15 countries.

1.17 MEANING OF AEROBIC TRAINING

Aerobic means with "air" or "oxygen". Aerobic exercise (also known as cardio) is physical exercise of relatively low intensity that depends primarily on the aerobic energy-generating process (**Sharon et al., 2007**). "Aerobic" literally means "living in air" and refers to the use of oxygen to adequately meet energy demands during exercise via aerobic metabolism (**William et al., 2006**).

Aerobic exercise not only keeps our body fit but also helps in maintaining our mind fresh for a longer period of time. It also increases the blood circulation of the body and prepares for the hard work, all day long. Aerobic exercise can also prevent chronic diseases and other health problems

related to lungs and heart besides strengthening the heart. The muscle mass can be increased and the weight can be controlled (**Ganesan, 2009**).

For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not. Playing singles tennis, with near-continuous motion, is generally considered aerobic activity, while golf or doubles tennis, with brief bursts of activity punctuated by more frequent breaks, may not be predominantly aerobic. Some sports are thus inherently "aerobic", while other aerobic exercises, such as fartlek training or aerobic dance classes, are designed specifically to improve aerobic capacity and fitness.

The aerobics exercise is a system of a cyclic exercise, which improves the capacity of cardiovascular functions, develops the toughness of muscles and the coordination of movement. A regular participation in aerobics exercise program, as in other endurance exercises, increases the capacity of cardiovascular system (**Garrick and Regua, 1998**).

1.18 EFFECTS OF AEROBIC TRAINING

Aerobic training increases both number of capillaries per muscle fiber and number of capillaries for a given cross sectional area of muscles. These changes improve blood profusion through the muscles, thereby enhancing the exchange of gases, water and nutrients between the blood and muscle fibers. The effect of doing regular aerobic training is:

- Strengthening and enlarging the heart muscle, to improve its function efficiency and reducing the resting heart rate.
- Strengthening the muscles involving respiration in order to facilitate the flow of air in and out of the lungs.
- Toning muscles throughout the body.

- Improving the efficiency of circulation and reducing blood pressure.
- Increasing total number of red blood cells in the body to facilitate the transport of oxygen.
- Improving mental health, including reducing stress and lowering the incidence of depression.

In addition high-impact of aerobic activities (such as jogging or jumping rope) can stimulate bone growth, as well as reduce the risk of osteoporosis for both men and women. The benefits of performing aerobic exercises are:

- Increased storage of energy molecules such as fats and carbohydrates within the muscles, allowing for increased endurance.
- Neovascularization of the muscle sarcomeres to increase blood flow through the muscles.
- Increasing speed at which aerobic metabolism is activated within muscles, allowing a greater portion of energy for intense exercise to be generated aerobically.
- Improving the ability of muscles by using fats during exercise, preserving intramuscular glycogen.
- Enhancing the speed at which muscle recover from high intensity exercise (**kolata and Gina, 2002**).

1.19 BENEFITS OF AEROBIC TRAINING

- The heart becomes stronger and more efficient regular aerobic training with which makes it easier for the heart to carry more amount of oxygenated blood at a time.

- It makes the heart attain a better physical fitness as it makes the resting heart rate slow down to about 60 bpm (beats per minutes).
- The number of oxidative enzymes increases, as does the number of mitochondria.
- It keeps the weight in check and keeps many diseases away from the body, so as the immune system becomes much stronger and resistant.
- It increases the BMR (basal metabolic rate) as well, which is the energy expended at a daily rate, even when the body is in its rest mode.
- It makes the body agile, more muscular and slimmer.
- It helps to relieve the stress in the life as the adrenalin produced during the exercise makes a person feel happier and more content.
- Helps to control body weight.
- Reduces the risk in developing diabetes, obesity and any heart diseases and hyper tension.
- There is an increase in good cholesterol and decreases bad cholesterol.
- Increases endorphins.
- Increases the body's ability to take in oxygen and makes breathe faster.
- Improves the body muscle strength and flexibility.
- Increases the resistance, fatigue and gives more energy.
- Improves mood and reduces depression and anxiety.

- It avoids overheating.
- Pumps the blood faster and more forcefully.
- Prevents from certain types of cancer.

1.20 TYPES OF AEROBIC EXERCISES

- Aerobic Dance
- Walking
- Jogging
- Running
- Jumping rope
- Stationary Bicycle
- Stair climbing
- Rowing Machine
- Treadmill
- Elliptical Machines
- Swimming

1.20.1 AEROBIC DANCE

Aerobic dancing involves many kinds of exercise, it's also an indoor activity which could be done in all weather condition, The involved exercises can included from country music line dance to hip-hop dancing. Aerobic dance improves flexibility and bone strength as well as create lot of fun to motivate our hard work.

1.20.2 WALKING

Walking at a moderate pace for 30-60 minutes burns stored fat and can build muscle to speed up the metabolism. Walking an hour a day is also associated with cutting the risk of heart disease, breast cancer, colon cancer, diabetes and stroke and is highly recommended for overweight and older people.

1.20.3 JOGGING

Jogging is a form of running at a slow or leisurely pace. The main intention is to increase physical fitness with less stress on the body than from faster running, or to maintain a steady pace for longer periods of time. It is a form of aerobic endurance training Performed over long distances.

1.20.4 RUNNING

Running is a means of terrestrial locomotion allowing individuals to move rapidly on foot is in contrast to walking. It is simply defined in athletics as a gait in which, at regular points during the running cycle both feet are off the ground. (i.e.) where one foot is always in contact with the ground, the legs are kept mostly straight and the center of gravity vaults over the stance leg or legs in an inverted pendulum fashion.

1.20.5 JUMPING ROPE

Jumping rope is an excellent way to build cardio fitness and it makes works the player's all-important calf and ankle muscles. The goal is to improve their endurance and build strength, not to them tax to the limit. Consider throwing in a few quick-step foot combinations, like a boxer, to improve their dexterity and coordination. They limit themselves to not more than three sets, five to 10 minutes each set.

1.20.6 STAIR CLIMBING

Stair climbing provides a triple workout because it strengthens heart, leg muscles and even bones. Because legs bear the body weight, while working vigorously, the leg muscles pull against leg bones, bones strengthen and become denser. Accordingly, stair-climbing not only makes the legs stronger, but also helps to prevent osteoporosis. Stair-climbing provides aerobic exercise as well as strength training, in other words, it raises the heart rate and increases endurance.

1.20.7 ROWING MACHINE

Rowing is a sport in which athletes' race against each other in shells on rivers, lakes or the ocean, depending upon the types of race and the discipline. The boats are propelled by the reaction force on the blades and they are pumped against the water. It is one of the few non – weight bearing sports that exercise all the major muscles groups and improves cardiovascular endurance and muscular strength.

1.20.8 TREADMILL

Treadmill is a device for walking /running while staying in the same place. The machine provides a moving platform with a mild conveyor belt driven by an electrical motor or a flywheel. The belt moves to the rear requiring using walk or run at a speed matching the belt, the rate at which the belt moves in the rate of walking or running, the speed of running is controlled by machine. Treadmill has a 'cardio mode' where a target heart rate is defined and the speed and elevation (load) is controlled automatically until the strength is in "heart rate steady state".

1.20.9 ELLIPTICAL TRAINER

An elliptical trainer or cross trainer(x-trainer) is a stationary exercise machine used to stimulate stair climbing, walking or running without carrying excessive pressure to the joints there by decreasing the risk of injuries. It is a “low impact” machine which offers a non-impact cardio vascular that can vary from higher to high intensity based on the speed of the exercises and the resistance.

1.20.10 SWIMMING

Swimming is another excellent low-impact aerobic exercise. Swimming makes the work almost all muscle groups, and the chances of pulling a muscle or putting excessive pressure on a joint are greatly diminished. All the plyometric exercises, such as squat jumps, split squat jumps, tuck jumps and lateral jumps, can be conducted in the water, with far less strain on back, knees, feet and ankles than the same moves performed on land.

1.20.11 STATIONARY BICYCLES

Stationary bikes offer the upside of endurance training without the downside of high-impact stress on knees and other joints. They're a good tool for cooling down after practice or a generic workout in between games. Spending about 30 minutes to an hour on the cycle or alternating the general steady workout with a few higher-tempo rallies would build in a bit of heavy exertion in an aerobic training.

1.21 AEROBIC FITNESS FOR BASKETBALL PLAYERS

A basketball player requires a multitude of skills, high levels of concentration and top-tier physical fitness. Aerobic exercises like jogging, stationary bicycling, jumping rope and swimming are some of the best ways

to build strength and stamina and to improve oxygen system so that one can build the endurance and discipline to play each game at maximum intensity until the final buzzer sounds.

This training is best developed during preseason and incorporates is exercise that enhances cardiovascular strength, makes ones breathe hard such as dancing, step aerobics, and kickboxing. This allows the use of oxygen while doing the work out. The best suitable aerobic exercises that can be included in the training programme of basketballers are walking, jogging, running and jumping rope.

The players in basketball would need the speed to run up and down the court, leaping ability to take jump shots sky high to grab rebounds, and the strength to battle for position and corral those rebounds in traffic. To become an all-around player who infect would need an all-encompassing workout routine to help succeed on the court.

Besides increasing the blood flowing apart from dynamic stretches to warm up the muscles, one can jog around the court a couple of times, then perform stationary stretches such as jumping jacks and arm circles; walking stretches such as high knee walks and lunges; then conclude with jogging stretches such as power bounds and but kickers. Perform some static stretches after the workout to help increase flexibility.

1.22 PHYSICAL FITNESS

Physical fitness refers to the ability to carry out daily tasks without being over tired. People who are fit have energy not only to complete everyday work, but also to participate in planned or unplanned activities outside the home or other workplace.

The World Health Organization defines fitness as “The ability to perform muscular satisfactorily.” In keeping with the definition, fitness implies that the individual who has attained those characteristics permit a good performance of a given physical task in specified physical, social and psychological environments (**Bouchard, 1994**). Physical fitness is the ability of the person’s body to meet the demands placed upon it by his works, by his way of life and by the necessity to meet emergencies. The following basic qualities of physical fitness should receive due attention. 1. Speed 2.Strength 3.Endurance 4.Agility 5.Flexibility and 6.Explosive Power.

1.23 PHYSICAL FITNESS VARIABLES

Among the many physical fitness variables, the researcher has selected the following variables such as speed, muscular strength, and flexibility as they play a vital role for basketball performance along with other variables.

1.23.1 SPEED

Speed is the quickness of movement of a limb, whether it is the legs of a runner or the arms of the shot putter. Speed is an integral part of every sport and can be expressed as any one of, or combination of, the following: maximum speed, elastic strength (power) and speed endurance.

Speed is the ability of an individual to perform successive movements of the same pattern at a fast rate, or even one single movement while speed would appear to be an innate quality. It can be improved by practice of the coordinated movements and by learning proper techniques (**Barrow and Mc Gee, 1991**).

Speed appears in different forms in various sports. The most important forms in which it appears are reaction ability, reaction time, movement time speed, acceleration, locomotors ability and speed endurance. But the different

types of speed abilities are relatively independent of each other (**Suresh 2003**).

Speed of movement is highly specific in two areas of the body. In fact, the specificity extends over the type of task and the direction or movements. The running speed is determined in terms of two factors such as the change of direction in basketball running or the acceleration of a sprinter. This fact is the most important consideration in speed for a distance up to 20yards and is very essential in court and field games and short distance. On the other hand for distances greater than 20yards, maximal running speed is more important factor. Therefore an individual may be proficient in handball, football, basketball and hockey, in which quick acceleration is important.

1.23.1.1 IMPORTANCE OF SPEED

Speed is desired in almost all sports activities, but in some sports its significance is more. In basketball, fast and firm movements are essential to good ball handling and a small increase in movement speed or running speed can improve the player efficiency and performance aspect from good sprinting ability. Runner plays a decisive role in the execution of different movements and actions through faster and smooth approach. Speed drills are important for the fast break – up that requires a run-up – where energy used for entire movements are the sole purpose of recurring goals.

1.23.1.2 IMPORTANCE OF SPEED FOR BASKETBALL PLAYERS

Speed is one of the most valuable assets a player can have in basketball. Speed in basketball is not necessarily about running as fast as possible in a straight line from a stationary position. More often, players need to be able to make short, lateral bursts and sharp cuts while already in motion. This guide will explore some effective strategies for building basketball-related speed. (<http://basketball.isport.com>)

1.23.2 STRENGTH

Strength exercises are those which involve lifting weights (or your own bodyweight) to help increase muscle strength but it is important to develop and maintain the suppleness of joints and muscles through safe stretching exercises by any exercises. This programme helps prevent injury and maintain a good range of movement. Activities such as yoga are particularly good for improving suppleness.

Strength is one of the most important components of physical fitness which enhances performance in all games and sports in some way or the other. The primary objective of strength is not to learn to lift as much as muscle weight as possible but to increase strength for application to the relevant sports. This is possible only when the coaches and physical education teachers use the correct and most beneficial and economical means to train their sports persons.

Since, all sports movements are executed by the contraction of muscles, therefore, strength has been considered as the most important conditional abilities, skills and tactical movements. As it also contributes to indirect development of other conditional ability namely speed and endurance it has been the most significant factor to enhance sports technique and performance.

1.23.2.1 MUSCULAR STRENGTH

Muscular strength is defined as the ability of a muscle group to develop maximum contractile force against a resistance in a single contraction. Size of the muscle cells and the ability of nerves to activate them are related to muscle's strength. Size of muscle cells and the ability of nerves to activate there are related to muscle strength.

Muscular strength is defined as “The maximum force or tension that can be produced by the muscle group”. Muscular endurance is “the ability of the muscle to maintain sub maximum force level for extended period”. Test requiring continuous repetitions of movement measure endurance. A true measure of strength determines the maximum amount of weight that can be moved in a single effort. However a high relationship does exist between strength and endurance measures.

1.23.2.2 IMPORTANCE OF MUSCULAR STRENGTH

Muscle performance refers to the capacity of the muscle to do work. The key elements of muscles performance are strength, power and endurance. To improve muscle performance all the above factors are to be determined.

Muscular strength produces force at high intensities over short intervals. It depends largely on the energy liberation processes in the muscles. All movements in sports are caused by muscle contractions and therefore, strength is a part of all motor abilities, technical skills and tactical actions. Strength training is good for general health, good posture and prevention of injuries.

1.23.3 FLEXIBILITY

Flexibility refers to the movement in a joint or group of joints, during a passive movement (passive meaning no active muscle involvement is required to hold the stretch; instead gravity or a partner provides the force for the stretch).

Flexibility is the quality of muscles, ligaments and tendons that enables the joints of the body to move easily through a complete range of movement **(Singh et al.)**.

1.23.3.1 IMPORTANCE OF FLEXIBILITY

Flexibility is the degree to which an individual is able to move the joints of the body through their complete range of motion. Physical activities and sports involve vigorous movements. The joints and muscles need a tremendous amount of flexibility to facilitate efficient and desired movements. Diving, hurdling, modern dance requires great flexibility in certain body region in order to demonstrate good form. However, a basketball player requires sufficient flexibility in all parts of the body to perform movements accurately. There are many movement such as split sitting, leaps, walkovers, etc. which depends purely on flexibility.

Fukushima (1980) describes flexibility as an important aspect in fast games that must be accompanied by muscular strength. The ability to hyper extends and flex of shoulders and hip, wrists and ankles essential requirement for learning many skills. Suppleness in all joints i.e. legs, particularly in the hips and shoulder region is essential to achieve the maximum possible range of movement.

Flexibility is a general component of physical fitness. Additionally, good range of motion will allow the body to assume more natural positions to help maintain good posture. Stretching is therefore an important factor to start and continue as one ages. Flexibility of a joint depends on many factors, particularly the length and looseness of the muscles and ligaments due to normal human variation, and the shape of the bones and cartilage that make up the joint. The primary reasons for increasing flexibility are enhances performance and reduces the risk of injury. The rationale for this is that a limb can move further before an injury occurs.

1.24 PHYSIOLOGICAL VARIABLES

Among many physiological variables, the researcher has selected VO₂ max, Vital capacity, and Respiratory rate as they are considered vital in any sports performance.

1.24.1 VO₂ MAX

VO₂ max is the maximum rate of oxygen intake 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.

Fitness of person can be measured by volume of oxygen that one can consume while exercising at their maximum capacity. (VO₂ max is the maximum amount of oxygen in milliliters, one can use in one minute per kilogram of body weight). Those who are fit will generally have higher VO₂ max values and can exercise more intensely than those who are not well conditioned. Numerous studies have shown that one can increase their VO₂ max by working out at an intensity that raises their heart rate between 65 and 85% of its maximum for at least 20 minutes three to five times a week. A mean value of VO₂ max for male athletes is about 3.5 liters/minute and for female athletes is about 2.7 liters/minute (**Swain, 1994**).

1.24.1.1 IMPORTANCE OF VO₂ MAX

VO₂ max is the maximal rate of oxygen consumption. It is a measure of one's capacity to generate the energy required for endurance activities and is one of the most important factors determining one's ability to exercise for longer than four to five minutes. Improving VO₂ max by 10 percent without changing any other performance factors can take more than a minute off 5k time, and is an essential factor in races from 800 meters to marathon. However, all individuals can make drastic improvements in VO₂max with the

right training stimulus. Thus, to attain one's best possible performances, VO_2 max improvement is one of the aspects of training that should not be ignored.

Based on the available research, it seems that maximal VO_2 max gains are achieved with a weekly running volume of 60 to 90 miles. By increasing mileage to 50 miles per week, VO_2 max is improved a further ten percent. Although increase in weekly mileage have shown to be particularly effective at increasing VO_2 max, it is important to remember that mileage should be increased gradually, with careful attention towards preventing over-training and injury. Also, VO_2 max improvements occur only if one keeps running intensity the same as they increase their mileage. If one increases his/her mileage, but slow down their daily running pace, little improvement will occur in VO_2 max.

Maximum oxygen intake (VO_2max) refers to the highest rate at which oxygen can be taken in and consumed by the body during intense exercises. Traditionally, the magnitude of an individual's VO_2 max has been viewed as one of the most important predictors of endurance. The ability of the cardio respiratory system to transport oxygen to the exercising muscles refers to the central component of VO_2 max. The role of the central component is for oxygen to be transported from the atmosphere and delivered to the muscles where it is utilized during mitochondrial respiration to produce ATP.

The major limitations of oxygen delivery are pulmonary diffusion, cardiac output, blood volume and flow. In aerobic work, oxygen is obtained from the air and is transferred from the lungs to the blood and then to the muscles via the circulatory system. Maximal oxygen intake or maximal aerobic power (VO_2 max) is the indicator of aerobic fitness. As VO_2 max increases, the level of aerobic fitness also increases, which refers to individual aerobic capacity, an individual who is fit, will have a cardio-respiratory

system that is capable of meeting the demands of the tissues under conditions of intense exercise.

1.24.2 VITAL CAPACITY

Vital capacity (VC) is the maximum amount of air that can be inhaled or exhaled from the lung. It is one of the measurements taken during spirometry or pulmonary function testing. VC is measured using a spirometer **(Pat Bass, 2009)**.

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

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

1.24.2.1 IMPORTANCE OF VITAL CAPACITY

The vital capacity and the residual volume are two values that help physiologists determine the health of the pulmonary system. These quantities capture the ability of an individual to transport oxygen through the lungs to the rest of the body. The vital capacity is easily measured by taking a deep breath and expiring into a spirometer.

Exercise will increase vital capacity because lungs need more oxygen to supply the muscles with vital nutrients. Lung capacity refers to how much air a person can expel from the lungs after an inspiration. Therefore the more one exercises the more nutrients he/she will need to support the system. Lungs expand during exercise session in order to cater for the extra need to

increase the vital capacity. Athletes usually have a higher forced vital capacity because their lungs are more developed, especially if they have been playing sports and working out for a long time. People like swimmers, runners, and ball game players can have significantly better lung health than other individuals.

1.24.3 RESPIRATORY RATE

Fox and Mathews (1981) define Respiratory rate as a number of breaths taken in a minute or number of inspiration and expiration in a minute. In other words, it is the rate at which the number of breath inspired and expired in one minute. The lesser respiratory rate would give good performance for all the games and sports. Regular participation in endurance activity such as jogging, cycling and distance swimming can be done to reduce the respiratory rate.

The number of breaths per minute or more formally the number of movements indicative of inspiration and expiration per unit time, in the respiratory rate is usually determined by counting the number of times the chest rises or falls per minute. The aim of measuring respiratory rate is to determine whether the respirations are normal, abnormally fast (tachypnea), abnormally slow (bradypnea), or nonexistent (apnea). (www.medterms.com)

1.24.3.1 IMPORTANCE OF RESPIRATORY RATE

The physiology of breath holding involves respiratory, circulatory and cardio changes, all of which are important in the light of recent research. Training increases vital capacity, the maximum volume of air the lungs exchange in one respiratory cycle and aids materially in establishing economy in the oxygen requirement. The process of taking in of air to the lungs and expelling of the air constitute one respiration (external and cellular). The importance of respiration in athletics is the capacity of respiratory rate, which

is very important for runners, which increases or decreases the time of the run. The capacity of the lungs and the respiratory system is an aerobic activity which increases the performance (**Nobb, 1986**).

1.24.3.2 IMPORTANCE OF RESPIRATORY RATE FOR BASKETBALL PLAYERS

Basketball players need to develop respiratory capacities which pertain to the ability of the body to supply the oxygen. Respiratory parameters vary from individual to individual and considered one of the important parameters for establishing top class performance in basketball as, the game involves more running of long duration.

1.25 PSYCHOLOGICAL VARIABLES

Among many physiological variables, the researcher has selected Anxiety and Aggression which are considered more significant to excel in elite performance.

1.25.1 ANXIETY

The term anxiety is used to describe the combination of intensity of behavior and direction of effort, or emotion. The direction of effort is the characteristic of anxiety in negatives; it describes subjective feelings that are unpleasant. Anxiety is defined as an uneasiness that is caused as a result of fear of misfortune or of danger.

It is a negative emotional state with feelings of nervousness, worry and apprehension associated with activation or arousal of the body (**Thelma, 1992**). **Crosta (2013)** explains anxiety as a general term for several disorders that cause nervousness, fear, apprehension, and worrying. These disorders affect how we feel and behave, and they can manifest real physical symptoms.

Mild anxiety is vague and unsettling, while severe anxiety can be extremely debilitating, having a serious impact on daily life.

Anxiety is a complex emotional state characterized by a general fear or fear binding usually accompanied by a tension. It is related to apprehension and fear and is frequently associated with failure, either real or anticipated. It has to do inter-personal relations and social situations. Feelings of rejection and insecurity are usually a part of anxiety.

1.25.1.1 IMPORTANCE OF ANXIETY

The coordinated movement required by athletic events becomes increasingly difficult when the body is in a tense state. Similarly, a certain amount of worry about how a player's performance can be helpful in competition, but severe symptoms of anxiety such as negative thought patterns and expectations of failure can bring about a self-fulfilling prophecy. If there is a substantial difference between how a player performs during practice and how he/she does during competition plays a vital role in which anxiety may be considered as one of the factors having direct bearing on the performance of the players. The dedication of players can help to overcome these fears in a variety of ways, programming themselves for success.

Anxiety is 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 behavior and directional effect or emotion.

Anxiety plays an important role in the acquisition of motor skills as well as in sports performance. Anxiety can either enhance or inhibit performance whether its effect is positive or negative depends on how an individual player perceives the situation. People with low trait level have been known to perform better in selected motor skills than those with high or trait

levels. There is also positive relationship between participants in competitions.

A moderate level of anxiety seems best for the acquisition and performance of motor skills. In other words the learning and performance would tend to be inhibited if level of anxiety become either too high or low (Cell, 1972).

1.25.2 AGGRESSION

Aggression is defined as "the behaviour directed towards goal of harming another living being who wishes to avoid such treatment (Robert, 1996).

Husman (1955) says, "Aggression is behaviour which is developed through training". The purpose of such aggression is the achievement of the end product, namely physical or psychological injury.

1.25.2.1 IMPORTANCE OF AGGRESSION

According to Mc Dougal aggression is being created through instincts. Husman (1955) says, "Aggression is behaviour which is developed through training". The purpose of aggression is the achievement of the end product, namely physical or psychological injury.

The main function of emotion is to provide mental power to physical actions. It covers all the bodily control. As soon as a certain physical action is over or the purpose is served or the thinking is changed emotions gets over, like some of the elastic things. 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. (Alagaonkar, 1997).

1.26 SKILL

A skill is the learnt capacity or talent to carry out pre-determined results often with the minimum outlay of time energy or both.

Exploring one's own capabilities, a game or sport allows a player to look at, understand and experience the various expected and unexpected requirements and demands of the game or sport because the performance and situations of the game is largely depend on the ground reality.

A movement dependent on practice and experience for its execution, as opposed to being genetically defined certainty skill enables athletes to produce predetermine results with maximum, often with the minimum expenditure of energy. Three important components of skill are effectiveness, consistency (the ability to reproduce the skill), and efficiency.

1.26.1 IMPORTANCE OF FUNDAMENTAL SKILLS

Fundamental skills are the key to success. It is the elegance and beauty of the skill that is the center point in the pursuit of sport. In any sports discipline, the mastery over the fundamental skill is essential to the eventual success. This means the correct technique for each stroke, grip, body position and basic movement patterns should be practiced and mastered, which ultimately enables one to achieve success. The mastery of skills is not only the consolidation of the essential techniques but also the ability to improvise so as to be flexible to meet the demands of the occasion. The highly skilled persons, in any sports discipline are noted for their consistency and stability in the execution of the skills. The individual style of execution arises from the manner in which the task is executed in a unique way. A player will have a feeling of confidence when he masters over the skill as stated below:

1. Skill of the game plays a very vital role in the success of modern basketball.
2. Each skill is having its own importance and application to different situations.
3. There are a number of fundamental skills in the game of basketball such as, Passing, Dribbling, Shooting, Individual defense, Offensive rebound and Defensive rebound etc.,
4. A basketball player must master over all the skills to prove his/her proficiency.
5. The perfection of these skills has a direct impact on the total performance of the game.

1.27 HISTORY OF BASKETBALL

Basketball was invented by the Canadian clergyman, educator, and physician James Naismith who was an instructor at the Young Men's Christian Association Training School (now Springfield College) in Springfield, Massachusetts in the year 1891. At the request of his superior, **Luther H. Gulick**, organized a vigorous recreation suitable for indoor winter play. The game involved elements of American football, soccer and hockey, and the first ball used was a soccer ball and the teams had nine players, and the goals were wooden peach baskets affixed to the walls. The game rapidly spread nationwide and to Canada and across the world, played by both women and men. It also became a popular informal outdoor game.

1.28 BASKETBALL IN INDIA

In India, the game basketball has started its journey in 1930 when it was played for the first time. The first Indian National Championship for men was conducted in 1934 in New Delhi. The Basketball Federation of

India (BFI) was formed in the year 1950 and the federation has direct control over the game. Throughout history, Indians learned to appreciate the game because of its fast scoring and intense activity from the beginning until the end.

Now a day, it is considered as one of the widely played sports across the country and one of those first few countries in the history of basketball that adopted the game within a few years of its inception and teams actually consisted of five players on the court.

Basketball in India is played by both men, women in most of the high schools, colleges and universities of all ages. There are many championships for senior, junior and youth levels for boys and girls. Invitational all-India Tournaments like Master Prithvinath Memorial (New Delhi), Don Bosco Invitational Tournament (Mumbai), Ramu Memorial (Mumbai), and many other tournaments in the southern part of India are being organized every year. Indian basketball has championships throughout the year for different age groups. Championship for youth is mainly organized between April to July when children are having summer break from school. Hence there is considerable patronage for the game among the younger generation.

India has produced numerous talented Basketball players, who have been honoured by the Government of India through the prestigious Arjuna Award and Dhyanchand Awards. Basketball in India is mainly being run and managed by a large number of national and state level associations, spread all over India. These basketball associations are working with a common view of popularizing the game across the nation. Apart from that, developing the overall infrastructure for the game and uncovering new talent from the grass route level are some of the other principal objectives of the Indian basketball associations.

1.29 THE NATURE OF BASKETBALL

Basketball is a team sport which involves two teams of 5 active players each trying to score points against one another by placing a ball through a 10 foot (3.048 m) high hoop (the goal) under organized rules. Points are scored by throwing (shooting) the ball through the basket from above. The team with more points at the end of the game wins. The ball can be advanced on the court by bouncing it (dribbling) or passing it between teammates. Disruptive physical contact (foul) is penalized and there are restrictions on how the ball can be handled (violations). Through times, basketball has developed to involve common techniques of shooting, passing and dribbling, as well as player's positions and offensive and defensive structures.

Successful game of basketball needs ability of the players to generate good speed, agility and tremendous power during the play of game. Skills like dribbling, shooting and passing are of utmost importance for a player at any level of play. Not merely skills but also physical and physiological characteristics of a player will contribute to the success of the player as well as the team (**Thani, 1997**).

Although basketball can be played outdoors, it was invented to serve as an exciting indoor exercise for the winter months in a northern climate. It quickly became a spectator sport, however, and now attracts large audiences to gymnasiums and arenas, especially in the United States, South America and Europe.

1.30 BASIC SKILLS OF BASKETBALL

- Dribbling
- Passing and Receiving
- Shooting

- Rebounding
- Defense and
- Offense

Among the many basketball Skill performance variables, the researcher has selected Dribbling, Passing and Shooting as the skill performance variables as they are basically pertinent in the Basketball performance.

1.30.1 DRIBBLING IN BASKETBALL

In basketball, dribbling is the legal method of advancing the ball by oneself, as opposed to passing it to another player or shooting for the basket. It consists of bouncing the ball on the floor continuously with one hand while walking or running down the court.

The dribble allows much faster advancement and thus more opportunities for scoring. It also provides a chance for a crafty player on the opposing team to "steal" the ball in mid-bounce. Once a player stops dribbling the ball and holds it, the player normally should either pass it to another player or take a shot. If the player dribbles and then holds the ball in any way (either grasping it with his/her hands or arms, or "palming" it, i.e. holding it too much toward its underside during the act of dribbling) then continues to dribble, just then the referee stops the play, signals either "double dribble" or "carrying", and pass the ball over to the other team. A "double dribble" may also be called if the player tries to dribble with both hands at the same time.

Dribbling should be done with finger pads and the fingers should be relaxed and spread, the wrist should be pushing the basketball, and the forearm should be moving up and down. Skilled ball handlers bounce the ball low to the ground, reducing the risk of a defender reaching to steal the ball. Adept dribblers can dribble behind their backs, between their legs and change

the speed of the dribble, making the player difficult to defend and opening up options to pass, shoot or drive with the ball.

Dribbling is the act of bouncing the ball continuously with one hand, and is a requirement for a player to take steps with the ball. To dribble, a player pushes the ball down towards the ground with the fingertips rather than patting it, this ensures greater control. When dribbling, passing an opponent, the dribbler should dribble with the hand farthest from the opponent, making it more difficult for the defensive player to get to the ball. It is therefore important for a player to be able to dribble competently with both hands.

Good ball handlers frequently dribble behind their backs, between their legs, and switch directions suddenly, making a less predictable dribbling pattern that is more difficult to defend against. This is called a crossover, which is the most effective way to move past defenders while dribbling. A skilled player can dribble without watching the ball, using the dribbling motion or peripheral vision to keep track of the ball's location. By not having to focus on the ball, a player can look for teammates or scoring opportunities, as well as avoid the danger of having someone steal the ball away from him/her.

1.30.2 PASSING IN BASKETBALL

A 'pass' is a method of moving the ball between players. Most passes are accompanied by a step forward to increase power and are followed through with the hands to ensure accuracy. Many passes are used in Basketball.

A staple pass is the chest pass. The ball is passed directly from the passer's chest to the receiver's chest. A proper chest pass involves an outward snap of the thumbs to add velocity and leaves the defence little time to react. Another type of pass is the bounce pass. Here, the passer bounces the ball

crisply about two-thirds of the way from his own chest to the receiver. The ball strikes the court and bounces up toward the receiver.

The bounce pass takes longer to complete than the chest pass, but it is also harder for the opposing team to intercept (kicking the ball deliberately is a violation). Thus, players often use the bounce pass in crowded moments, or to pass around a defender. The overhead pass is used to pass the ball over a defender. The ball is released while over the passer's head. The outlet pass occurs after a team gets a defensive rebound. The next pass after the rebound is the outlet pass.

The crucial aspect of any good pass is it being difficult to intercept. Good passers can pass the ball with great accuracy and they know exactly where each of their other teammates prefers to receive the ball. A special way of doing this is passing the ball without looking at the receiving teammate. This is called a no-look pass. Another advanced style of passing is the behind-the-back pass which, as the description implies, involves throwing the ball behind the passer's back to a teammate. Although some players can perform such a pass effectively, many coaches discourage no-look or behind-the-back passes, believing them to be difficult to control and more likely, to result in turnovers or violations.

1.30.3 SHOOTING IN BASKETBALL

Shooting is the act of attempting to score points by throwing the ball through the basket, methods varying with players and situations. Typically, a player faces the basket with both feet facing in the same direction. A player will rest the ball on the fingertips of the dominant hand (the shooting arm) slightly above the head, with the other hand supporting the side of the ball. The ball is usually shot by jumping (though not always) and extending the shooting arm. The shooting arm, fully extended with the wrist fully bent, is held stationary for a moment following the release of the ball, known as

a follow-throw. Players often try to put a steady backspin on the ball to absorb its impact with the rim. The ideal trajectory of the shot is somewhat controversial, but generally a proper arc is recommended. Players may shoot directly into the basket or may use the backboard to redirect the ball into the basket.

The two most common shots that use the above described setup are the set-shot and the jump-shot. The set-shot is taken from a standing position, with neither foot leaving the floor, typically used for free throws, and in other circumstances the jump-shot is taken in mid-air, the ball released near the top of the jump. This provides much greater power and range, and it also allows the player to elevate over the defender. Failure to release the ball before the feet return to the floor is considered a travelling violation.

Another common shot is called the lay-up. This shot requires the player to be in motion toward the basket, and to "lay" the ball "up" and into the basket, typically off the backboard (the backboard-free, underhand version is called a finger roll). The most crowd-pleasing and typically highest-percentage accuracy shot is the slam dunk, in which the player jumps very high and throws the ball downward, through the basket while touching it.

Another shot that is becoming common is the "circus shot". The circus shot is a low-percentage shot that is flipped, heaved, scooped, or flung toward the hoop while the shooter is off-balance, airborne, falling down and/or facing away from the basket. A back-shot is a shot taken when the player is facing away from the basket and may be shot with the dominant hand or both; but there is a very low chance that the shot will be successful.

A shot that misses both the rim and the backboard completely is referred to as an air-ball. A particularly bad shot or one that only hits the backboard is jocularly called a brick (www.en.wikipedia.org).

1.31 BASIC NEEDS OF BASKETBALL PLAYERS

Basketball is a game that relies a lot on speed, power and stamina (or to be more accurate, endurance). Therefore, the training that a basketball player does or goes through should be such that it targets these three aspects (i.e. speed, power and endurance). Of course, the type of build and physique that the player should aim at will vary a bit depending on what position the player plays (guard, center or forward). However, there are certain common physical characteristics or fitness requirements which should be possessed by all basketball players. These happen to be a powerful lower body, super-strong leg muscles, arms, shoulders etc. Therefore, the players should aim at performing those basketball workouts which will target these specific body areas (www.buzzle.com).

According to **Ebert and Cheatam (1977)**, though the individuals acquire various methods of shooting suited for specific positions, each player must first obtain proficiency in the three basic shots, the leg-up, the set and the jump shot. Regardless of the shot, the following fundamentals are essential:

- i. Contacting the ball and relaxing the body.
- ii. Ability to concentrate.
- iii. Ability to aim at a specific target.
- iv. Positioning the ball.
- v. Releasing the ball.
- vi. Follow through.
- vii. Predetermining the flight of the ball.

1.32 PREREQUISITES FOR A BASKETBALL PLAYER

As the important prerequisites for a good performance in Basketball, the skills related factors are as follows.

Generally the performance of a basket ball player depends largely on physical fitness factors such as strength, speed, endurance, flexibility and various coordinative abilities. Speed plays a vital role in the modern basket ball game played for 40 minutes with 2 minutes break between 1st & 2nd quarter and 3rd & 4th quarter and 15 minutes between 2nd & 3rd quarter. When a player gets tired his / her skills are inaccurate, and will not be able to perform satisfactorily. Endurance is another important fact for ensuring good quality of the skills, besides accuracy, rhythm etc. Co-ordination and flexibility are other important fitness factors; along with reaction time and movement time which is as immensely importance for a basketball player whether in offensive or defensive position. An offensive player has to react quickly and execute the shooting faster to outwit the defense. The defensive players should be quick enough to react and execute to tackle successfully.

1.33 REASON FOR SELECTING THE TOPIC

Yogic practices and Aerobic 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 essences of yoga lies in strengthening to enjoy mental power, improved concentration ability, a relaxed state of living and harmony in relationships.

Through the practice of yoga, one becomes aware of the inter connectedness between the 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 a being.

Aerobic exercises will force a player to breathe quickly and more deeply. The **Mayo clinic** states that the aerobic training maximizes the amount of oxygen in the blood. Player who develops high lactic acid tolerance will be able to consistently throw the ball throughout maintaining their speed and power, which intern allows a player to recover completely during intervals between games.

There are a number of studies already undertaken in yoga and aerobic exercises. However, no study has been conducted on the isolated and combined effects of yogic practices and aerobic exercises on selected physical fitness, physiological, psychological and skill performance variables of women basketball players.

Hence the scholar has intended to take-up a study on isolated and combined effects of yogic practices and aerobic exercises on selected physical fitness, physiological, psychological and skill performance variables of women basketball players.

1.34 OBJECTIVES OF THE STUDY

1. The study will help to find out the impact of isolated and combined effect of yogic practices and aerobic exercises on selected physical fitness variables like speed, muscular strength, and flexibility of women basketball players.
2. The study will help to find out the impact of isolated and combined effects of yogic practices and aerobic exercises on the selected physiological variables like VO₂ Max, vital capacity, and respiratory rate of women basketball players.

3. The study will help to find out the impact of isolated and combined effects of yogic practices and aerobic exercises on the selected psychological variables such as anxiety and aggression of women basketball players.
4. The study will help to find out the impact of isolated and combined effects of yogic practices and aerobic exercises on the selected skill performance variables like Dribbling, Passing and Shooting performance of women basketball players.

1.35 STATEMENT OF THE PROBLEM

The purpose of the present study is to find out the effect of isolated and combined effects of yogic practices and aerobic exercises on selected physical fitness, physiological, psychological and skill performance variables of women basketball players.

1.36 HYPOTHESES

1. It was hypothesized that there would be significant improvement on selected physical fitness variables namely speed, muscular strength, flexibility due to the influence of isolated and combined effects of yogic practices and aerobic exercises among women basketball players.
2. It was hypothesized that there would be significant improvement on selected physiological variables namely VO_2 max, vital capacity, respiratory rate due to the influence of isolated and combined effects of yogic practices and aerobic exercises among women basketball players.
3. It was hypothesized that there would be significant improvement on the selected psychological variables namely anxiety and aggression

due to the influence of isolated and combined effects of yogic practices and aerobic exercises among women basketball players.

4. It was hypothesized that there would be significant improvement on the selected skill performance variables namely passing, dribbling and shooting due to the influence of isolated and combined effects of yogic practices and aerobic exercises among women basketball players.
5. It was hypothesized that there would be significant differences on the selected physical fitness physiological, psychological and skill performance variables among the experimental groups.

1.37 DELIMITATIONS

The study was delimited into the following aspects:

- 1) The samples for the present study were limited to women basketball players only.
- 2) Sixty (n=60) women basketball players who participated at inter-collegiate women basketball tournaments of University of Madras, Tamil Nadu during the year 2012-2013 were selected as subjects.
- 3) The age of the subjects were ranged from 18 to 21 years.
- 4) The subjects selected were divided at random into four groups of fifteen each (n=15). Group-I underwent yogic practices, Group-II underwent aerobic exercises, Group-III underwent combined yogic practices and aerobic exercises and group IV acted as control group.
- 5) The duration of the training period was restricted to 12 weeks with six-days of training per week except Sunday.
- 6) The dependent variables selected for this study were:

Physical fitness variables

- i. Speed
- ii. Muscular Strength
- iii. Flexibility

Physiological variables

- i. VO₂ Max
- ii. Vital Capacity
- iii. Respiratory Rate

Psychological variables

- i. Anxiety
- ii. Aggression

Skill Performance Variables

- i. Dribbling
- ii. Passing
- iii. Shooting

The independent variables selected for this study were:

- i. Yogic Practices
 - ii. Aerobic Exercises
 - iii. Combined Yogic practices and Aerobic exercises
- 7) The data were collected prior to and immediately after the training period of twelve weeks.

1.38 LIMITATIONS

The study was limited into the following aspects:

1. The uncontrollable change in climatic conditions such as atmospheric temperature, humidity and other meteorological factors during the period of experimental treatment and the time of pre and post tests were considered as limitations.
2. The previous experiences of the subjects if any, during the period of experimentation and its possible influence on the criterion variables, could not be controlled.
3. The nutritional intake of the subjects were not under the control of researcher when testing or prior to testing.
4. The quantum of physical exertion, life style and other factors that affect the metabolic functions were also considered limitations.

1.39 DEFINITIONS OF OPERATIONAL TERMS

1.39.1 YOGIC PRACTICES

Yoga is a Hindu discipline aimed at training the consciousness for a state of perfect spiritual insight and tranquility. A system of exercises practiced as part of this discipline is to promote control of the body and mind.

1.39.2 AEROBIC EXERCISES

Aerobic means, “With oxygen”. During aerobic exercises a large portion of the required energy is obtained from the aerobic energy system.

The aerobic capacity is the maximal amount of energy that can be produced by the system **(Reid and Thomson, 2008)**.

1.39.3 SPEED

Speed is the ability of an individual to make successive movement of the same kind in the shortest period of the time **(Singh, 1996)**.

1.39.4 MUSCULAR STRENGTH

Muscular strength is the ability of a muscle or group of muscles to overcome resistance or act against resistance **(Singh, 1991)**.

1.39.5 FLEXIBILITY

Flexibility can be defined as the ability to perform movement with greater range of motion or large amplitude **(Uppal, 1992)**.

1.39.6 VO₂ MAX

VO₂ max is the maximal oxygen intake 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.

1.29.7 VITAL CAPACITY

Vital capacity refers to the ratio of maximum of air exhaled after the deepest possible inhalation **(Miller, 1965)**.

1.39.8 RESPIRATORY RATE

It is a number of breaths taken in a minute or number of inspiration / expiration in a minute **(Fox and Mathews, 1981)**.

1.39.9 ANXIETY

Cretty defines that ‘Anxiety appears to be a general fear of foreboding a personality trait marked by a lower threshold to stressful events’.

1.39.10 AGGRESSION

Cratty (1989) stated that, aggression is behaviour and actions that usually seek to inflict psychological or physical harm, either on person or on persons or dear ones.

1.39.11 DRIBBLING

When a player repeatedly pushes, pats, taps or bats the ball toward the floor with one hand to cause the ball to bounce back up to either of his hands; used to advance the ball or keep control of it is called Dribbling. (www.firstbasesports.com).

1.39.12 PASSING

Passing is the act of throwing the ball to a team mate.

1.39.13 SHOOTING

A player who takes a shot at the basket is called shooting (www.firstbasesports.com).

1.40 SIGNIFICANCE OF THE STUDY

1. This study may help to explore the levels of speed, muscular strength, flexibility, VO₂ max, vital capacity, respiratory rate, anxiety, aggression, dribbling, passing and shooting among women basketball players.

2. The results of study may add to the quantum of knowledge in the area of Basketball.
3. The findings of the study may provide useful information and guidelines to physical education administrators, coaches and players to understand better the importance of physical, physiological and psychological parameters to enhance their maximum performance.
4. Based on the results of this study, similar training program may be scheduled to develop selected parameters for other team games.
5. This study would open a new channel for future studies by combining these activities in various proportions and with some modifications.