Chapter 1

Introduction

1.1 Background of the study

In the existing literature, it has been reported that in all fields of a human being’s attempt, organized objectives and scientific practices were followed in accordance with the principles based on knowledge, understanding and application of knowledge of science. The field of games and sports was also no exemption to this. Nations like U.S.A., Germany, Russia, Australia, Britain and others have made progress in games and sports like track and field, soccer, hockey, basketball and so on. This progress and the international attainments have been possible due to the research trailing and application of scientific knowledge. (William, 1980).

A sportsman is trained scientifically with the latest training methods and sophisticated instruments for developing are performance in different orbits of sports. Sport sciences have consented to sportsmen for developing physical capacities beyond anything imagined. Sports have turned out to be cut-throat and records are being out of order at a superior pace. (Gandhi, 1982)

Sport is accepted as an educational phenomenon. There are constant efforts taken to achieve higher standards of performance. As a consequence, sport demands optimum physical fitness and highest degree of performance. Many people take part in sports activities for the fun of it or for health and fitness
reasons. Sports have become a profession to some with high skills, giving financial benefits linked with high degree of reputation. (Sergio, 1976)

It is accepted almost across the world that routine physical exercise facilitates one to be physically fit to carry out the usual daily activities. But anybody who wishes to take part effectively in sports and games and aspires to be a campaigner or to attain the top level must go beyond the undemanding rule of routine exercises. He must be abundant in intense and recurrent physical qualities, most necessary for accomplishment in his meticulous sports venture. (Ghosh, 1980)

The presentation level of sportsman in various games and sports is showing substantial enhancement steadily. The important factor responsible for this enhancement is the expansion of new training methods based on scientific principles derived from exercise physiology. These are necessarily integrated in physical education and highly developed sports training. At the same time, development of improved techniques and tactics, of new equipment and improved facilities and scientific understanding rendered by the sport scientists is also responsible for improved performance.

Yoga is found very effective with reference to high level performance in sports. (www.lifepositive.com, 2009) Yogic practices have shown tremendous effect and are used as training means for an athlete. Basically Asanas and Pranayama techniques are proved to be more effective of the other limbs of Yoga. Most Asanas mean holding the body in a particular position to bring stability to the body and poise to the mind. The practice of Asanas brings purity in tubular
channels, firmness to the body, and vitality to the body and the mind. 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 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 of “A Sound mind in Sound Body”. By practicing Asanas one frees himself from physical disabilities and mental distractions. It is a state of complete equilibrium of body, mind and spirit.

Yoga is one of the most ancient cultural heritages of India. (www.lifepositive.com, 2009) It was invented by Hindu yogis over 2500 years ago. The word yoga means ‘unity’ or ‘oneness’ and is derived from the Sanskrit word ‘yuj’ which means ‘to join’. In this sense, it is an exercise in moral and mental cultivation that generates good health (arogya), contributes to longevity (chirayu), and the total intrinsic discipline culminates into positive and perennial happiness and peace. It works on all aspects of the person: the physical, mental, emotional, psychic and spiritual. Therefore, yoga is the said to be indispensable of the ultimate accomplishment in life. It is a science that affects not only the conscious self but the subconscious as well. Hath Yoga which includes Pranayama, is now being practised by many people purely as a part of physical exercises devoid of religious or spiritual considerations. It is being used as an additional system to tone up the body and mind.

Yoga literally means union. (www.lifepositive.com, 2009) The whole system of yoga was developed to attain the highest state of Chitta (i.e. mind) or
consciousness where everything is merged into absolute consciousness. Patanjali the father of classical Yoga has explained the eight angas (eight limbs) of Yoga to advance oneself on the spiritual path, while Hath yoga explored the bodily postures of Asanas as well as Pranayam, to prepare oneself for the highest Yogic practices like Dharana, Dhyan and Samadhi. Today what is in vogue are these Hath Yoga practices i.e. Asanas, Pranayam, Bandha, Mudra, Kriya etc. and are known to contribute to the physical as well as mental well-being. People have understood the potentiality of these Yogic practices as the ways and ‘means’ to promote and maintain the healthy state of body and mind.

According to Patanjali, (www.lifepositive.com, 2009) Yoga means integration at all possible levels. Kuvalayananda, while considering the concept of yoga stated that if we take the cross section of the society and take a general survey of the public opinion about Yoga, Yoga may have therapeutic aspect but that does not represent whole yoga. If the limitations and the scope of the therapeutic yoga are to be stated in a few words we may say that it cannot help in all types of diseases, it is helpful only in some chronic functional disorders. As Kirk, B and Turo (Kirk & Turo, 2004) stated Hath Yoga practices such as Asanas, Pranayam, Bandha, Kriya and Mudra are intended to stabilize the psycho-physiological mechanism so there is less and less tendency towards and imbalance in the face of external and internal stimuli.
According to Swami Kuvalayananda (www.lifepositive.com, 2009) importance of Yogasanas is as follows

- Yogasanas give sufficient exercise to the internal organs of the body. With this an individual can maintain good health and longevity of life.
- A small airy place and few types of equipment are required for Yogasana practice.
- Yoga is a solo-practice, whereas two or more individuals are required in other games.
- Yogasanas help to develop physical and mental powers to calm the mind and control the senses.
- Yogasanas are not expensive.
- Yogasanas help the body to acquire more resistance power to keep the disease away.
- The body becomes more flexible.
- One looks younger in age and lives longer.
- Through different Yogasanas the blood in blood vessels is purified.
- By practising Yogasanas the power of contraction and expansion of lungs is increased and this results in the purification of blood.
- Yogasanas keep the spinal cord flexible.
- Yogasanas are ‘non-violent activity’ and a person becomes morally good.
- Yogasanas stimulate different glands of the body, which helps the body to acquire a well-balanced growth.
• By practicing Yogasanas, diseases like constipation, gas trouble, diabetes, blood-pressure, headache etc. can be cured.

• Yogasanas make possible not only physical and mental development but also intellectual and spiritual development.

• There is no restriction of age and sex for Yogasanas and one can enjoy sound health for a long time.

• Yogasanas reduce fatigue and soothe nerves.

Advantages of Yoga

• Physiological advantages of Yoga

In modern scientific age, in every field of human endeavour, systematic objectives and scientific procedures are followed in accordance with the principles based on experience, understanding and application of knowledge of science. (www.lifepositive.com, 2009)

There is a growing realization of improvement of physiological variables enhancing human health and performance so physiological variables such as blood pressure, respiratory and pulse rate receive a special consideration. Yoga is a very ancient discipline. Yoga has the sure remedies for physical as well as psychological ailments of a human. Yoga makes the organs of the body active in their functioning and has good effect on internal functioning of human body.

The psycho-neurological benefits of Yoga, as proved by scientific research, have been presented below to understand the real significance of Yoga.
• **Health and Physical Fitness advantages**

It has been shown to offer both physical and mental benefits to the body and the mind. The many physical benefits of hath yoga are: it improves flexibility and the muscle joint mobility strengthens, tones and builds muscles, corrects postures, strengthens the spine, eases back pain, improves muscular-skeletal conditions such as bad knees, tight shoulders and neck, swayback and scoliosis, increases stamina, creates balance and grace, stimulates the glands of the endocrine system, improves digestion and elimination, increases circulation, improves heart conditions, improves breathing disorders, boosts immune response, decreases cholesterol and blood sugar levels and encourages weight loss.

• **Yoga benefits as an Exercise**

Hath yoga provides the means for people of any age not only to get and stay in shape but also to develop balance, coordination and sense of centeredness. It renews, invigorates and heals the body – stretching and toning the muscles, joints and spine and directing blood and oxygen to the internal organs (including glands and nerves). Yoga is distinctly different from other kinds of exercise. It generates motion without causing strain and imbalances in body. When practised correctly, yoga has no such negative effects on either the inner or outer body.

When done with dedication and purpose, yoga can be a quite demanding, yet an immensely rewarding type of exercise. While not inherently aerobic, it involves almost every muscle in the body and challenges the body to work in different
and often more passive way. Since the limbs function as free weights, resistance is created by moving the body's centre of gravity. This strengthening gives way to endurance as poses are held for longer periods of time.

A consistent hath yoga practice can quieten the mind and refreshes the body, bringing health, relaxation and happiness.

- **Yoga Benefits and Sports**

Yoga postures are physical postures that coordinate breath with movement and withholding the position to stretch and strengthen different parts of the body. (www.lifepositive.com, 2009) Asana practices is the ideal complement to other forms of exercises, especially running, cycling and strength training, as the postures systematically work on all the major muscle groups, including the back, neck and shoulder, deep abdominal, hip and buttock muscles and even ankles, feet, wrists and hands.

By their very nature, asanas affect major and minor muscle groups and organs as they simultaneously impart 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 you choose to practise, yoga can enhance and complement your ability. Most sports build muscular strength and stamina, often in specific areas of the body. Yoga can help to check imbalance if any in muscular development and will enable both your body and your mind to function more efficiently. If
your body is flexible and supple you will be less prone to sports injuries, as your joints will be kept lubricated.

➢ Golfers may be prone to one-sided or uneven muscle development. Yoga asanas can strengthen weak areas and ease muscular tension. The standing poses improve balance and muscle flexibility.

➢ Yoga breathing techniques help swimmers to breathe in a relaxed way when exercising.

➢ For bicyclists, back bends can relieve any stiffness caused by bending over handlebars. Because a cyclist's back stays in one position for long periods, the muscle may become tense. This can be remedied with stretches. Gentle stretching exercises also ease stiffness in the legs and shoulders. Yogasanas will also improve flexibility.

➢ Racket sports often involve intense physical effort. Yoga practice can help players to relax and replenish their energy after strenuous games. It also promotes calm, clear thinking, even in situations that call for fast reactions. Asanas for joint mobility can make hips and shoulders more flexible.

➢ Yoga for swimmers (Pingluo, 2007)

To be a successful swimmer, one needs a unique formula of strength and flexibility. The act of early application of force becomes the key in many occasions. Ease and fluidity stems from coordination of muscles, breath and body allowing the focus of energy in the right places instead of being expended unnecessarily. Yoga can help to develop this coordination.
Along with physical fitness factors, other advantages are as follows:

a. **Body intelligence**

It is a known fact that to get more distance for every stroke, a swimmer does not use arms and legs alone. The muscles of the arms and legs are connected to the core body muscles. Heightened awareness developed as a result of yoga will allow the swimmer to maintain this connection, helping to improve strokes per distance ratio.

b. **Muscle development**

In yoga strength is not seen as a function of muscle bulk. (Pingluo, 2007) It is a consequence of the consolidation and concerted, coordinated effort of the individual fibres within the muscle. This attribute aids the swimmers to achieve the early application of force. Consistent practice of yoga yields muscles that are both lengthened and strong with less fibrotic (scar) tissue than what commonly develops as a result of weight training with its often insufficient focus on stretching.

c. **Triumph over fatigue**

Mentally the swimmer must be able to focus on the task at hand, have tremendous confidence, be able to stay calm and have flexibility to adapt to various challenges. (Pingluo, 2007) Regular yoga practice relieves muscle tension and joint restriction while Pranayama (yogic breathing) slows respiration and normalizes the breath. This engages the parasympathetic nervous system, a complex biological mechanism that calms and soothes us.
After stating the advantages of Yoga for swimming, the researcher now explains about Suryanamaskar, and its advantages for swimming.

1.1.1 Suryanamaskar

Fit physiological system of the body must function well enough to support the specific activity that the individual performs. (Modak & Joglekar, 2010) To get rid of physical problems, Suryanamaskar is a simple, yogic exercise that provides immense health benefits. Suryanamaskar is a sequence of yogic postures along with chants that together comprise a complete yoga.

Suryanamaskar: Sun-worship and exercise

Suryanamaskar is a unique mode of paying obeisance to the sun-god. (Modak & Joglekar, 2010) Physical exercises reflect a spiritual quest. A happy harmony of mind and spirit is sought and achieved. Mind and spirit complement each-other. Equilibrium is achieved. Proper circulation of blood generates natural rhythm, making all organs of the human body to function with a new vibrancy.

Thirteen holy hymns are prescribed for recitation, synchronizing the Suryanamaskar (i.e. the holy salutations) wherein changing of physical postures of the entire body is involved. These hymns are ‘Nama-Mantras,’ the sacred denominations of the sun. The hymn and Nama-Mantra bear a special significance. It should be sung clearly in an undiluted form with utmost devotion. It strengthens one’s faith and gives ones unique and indomitable power. Hence, one should practice at least thirteen Suryanamaskar regularly every day with full faith and devotion. Nowadays, Suryanamaskar can be practised with playing of ‘Āruni’ audio-cassette. By tuning the mind to the
rhythmic breathing and physical movements, one can have the delightful experience of making the entire body fresh and free from any fatigue.

Figure 1.1 Sequential positions of each Suryanamaskar

(Adapted from Unkule, N., 2014 'Suryanamaskar - Adhunik Jeevanshailicha Swasthyasobati)

Students should give attention to the special technique of breathing which goes with Suryanamaskar. The breathing is recommended to be of two seconds duration for every position explained. One should inhale (Puraka) and exhale (Rechaka) deeply and slowly. The retention of breath is called Kumbhak, which comes in the fifth and the tenth positions as illustrated below.
1.1.2 Breathing exercise (Pranayama)

Breathing exercise or Pranayama aims at bringing the involuntary functions of the respiratory mechanism within human control. (Unkule, 2015) The term Pranayama has been constituted by two words: Prana + Ayama. Prana is the vital force which pervades the whole cosmos. Prana is more subtle than air and can be defined as the energy essence that is within everything in the universe. 'Prana is the principle of development and sustenance both of the nervous and cellular tissues of the body and the mind. In the process of breathing when the 'prana' air is inhaled, definite action takes place. One is related to the ingestion of oxygen into the alveoli and the other to the ingestion of the nervous energy into the brain system. Ayama means to control or to give a rhythm or a definite flow. In this sense Pranayama may be defined as a process and technique through which vital energy can be stimulated and increased and this brings about perfect control over the flow of Prana within the body.

Pranayama is an exact science. (Unkule, 2015) Regulation of breathing, as a matter of fact, is natural. It hardly offers any scope of artificiality. The breath enters through the nose and depending on one’s general health and strength of the lungs; it is retained inside and then is exhaled. This natural condition of intake and outflow of the breath goes on continuously and it is on this process that human life depends. The difference between this natural process and the 'Pranayama' is that in the former the inhalation and exhalation is not necessarily connected with the mind; that process continues owing to the natural functioning of the heart and lungs. The inhalation and the exhalation are, hence,
not of any set duration. In some person the inhalation may take a longer time than the exhalation and in some others the opposite may occur. In Pranayama, however, there is a systematic regulation of both the inhalation and exhalation. This is for the reason that the mind is joined to the action of inhalation and exhalation known as Puraka and Rechaka respectively in practicing the Pranayama. Hence, their longer and shorter duration within a specified time has to be controlled. The result of this controlled inhalation and exhalation, both in respect of speed and time has a more beneficial effect on the mind and the body than that of the natural process. Most of us who largely depend on the natural process will derive immense benefit on falling ill by controlled inhalation and exhalation. Such persons should inhale slowly and exhale equally slowly in the beginning for 5 to 10 times depending on their strength and continue doing this morning and evening for 25 to 30 days. The natural inhalation is hence called "Shwasana" or breathing and the inhalation and exhalation which is done extending the time limit by applying the power of mind is called "Deergha Shwasana" or Pranayama. Variations in Pranayama are explained further.

- **Anulom Vilom Pranayama**

Sit in Sukha Asana and take deep breathe with one nostril open and the other closed by use of your fingers. (Unkule, 2015) Now release the air by another nostril which was closed while inhaling the air and closing the other nostril by use of fingers. Take deep breath by the nostril through which air was exhaled last time and exhale the air through another nostril.
By doing this anulom-vilom Pranayama for about 15 minutes a day you can cure the following diseases:

1. Hypertension or high blood pressure
2. Diabetes
4. Asthma
5. Bronchitis

Anulom-vilom Pranayama, also called the alternate nostril breathing technique, is an incredible energiser, which works effectively to relieve stress and anxiety. Regular practitioners have also treated their serious health conditions, which include heart problems, cartilage, depression, asthma, high blood pressure and arthritis. Some of the practitioners also treated bent ligaments, neural tissues, migraine pain and sinus by exercising anulom-vilom Pranayama.

**Benefits of Anulom Vilom Pranayama**

Not just Yogis know Anulom-vilom Pranayama benefits, but scientists also have discovered through a research that the nasal cycle corresponds with brain function. (http://www.yogawiz.com/pranayama.html) The electrical activity of the brain was found to be greater on the side opposite the less congested nostril. The right side of the brain controls creative activity, while the left side controls logical verbal activity.

The research showed that when the left nostril was less obstructed, the right side of the brain was predominant. Test subjects were indeed found to do better on creative tests. Similarly, when the right nostril was less obstructed the left side
of the brain was predominant. Test subjects did better on verbal skills. Not just the brain, practising Anulom-vilom Pranayama regularly purifies the different channels of the body, making it healthy, strong and lustrous. It cures all the diseases that occur due to the disturbance of the 'VataDosha'. These include rheumatism, gout, diseases that are related to the reproductive organs, and cold. (http://www.yogawiz.com/pranayama.html)

- The three doshas of Vata, Kapha and Pitta are also regularized with regular practice of Anulom-vilom Pranayama.
- Blood pressure and diabetes can be cured completely with the regular and dedicated practice of this Pranayama.
- Diseases of the muscular system are cured and are beneficial in arthritis, flatulence and varicose veins, acidity and sinusitis.
- Thinking becomes positive and you learn to overcome tension, anger, worry and forgetfulness, anxiety, uneasiness, high blood pressure, migraine and lack of sleep.
- Concentration, patience, resoluteness, decision-making ability and creativity also increase as advantages of Anulom-vilom Pranayama.
- Increases oxygen supply throughout the body, making one feel calm and peaceful.
- Relieves stress, fever, eye concerns and ear issues.
- Improves blood circulation.
- Treats migraine, blockages in the arteries of the heart and chronic sinus problems.
- Transforms negative thoughts to positive.
- Controls obesity.
- Streamlines metabolism.
- Treats conditions of constipation, gastric acidity, allergic problems, asthma, diabetes, other gastric problems and snoring.

**Kapalbhati Pranayama**

Kapala is the word for Skull and Bhati means 'to shine'. Thus, together the word means an exercise that brings a shine to the skull. Kapalbhati is about short, forceful exhaling. This is an abdominal breathing exercise.

This is a type of breathing exercise that helps one to become healthy and fit. The exercise purifies the lungs and nasal passage. It is one of the powerful breathing exercises which help the entire body. Kapalbhati helps to make the motions of diaphragm very easy and controlled. This helps it to discard the muscle cramps present in bronchial tubes. Kapalbhati is quite simple, though one has to perform this correctly to get the complete benefits of the breathing technique. One has to breathe slowly and then force the breath outside. Kapalbhati can increase the pressure of air in the sinus and nasal pharynx – this energizes the frontal part of the brain.

**Benefits of Kapalbhati**

- Kapalbhati improves the blood circulation due to fresh supply of blood
- It improves respiration and the capacity of the lungs and help cure respiratory diseases like bronchitis and asthma.
- It is helpful in allergies and sinus.
• This breathing exercise can purge toxins from the body and helps to clean the internal system.

• It improves the function of pancreas. Helps to produce insulin hormone naturally.

• Improves the function of reproductive system.

• Kapalbhati can improve digestion and can cure stomach-related diseases like flatulence and indigestion.

• This exercise can also help to treat diabetes.

• It is helpful in kidney problems and it lowers down the high cretin level.

• Kapalbhati can burn abdominal fat resources and helps to lose weight. It is said to tone up the muscles of the abdomen.

• Kapalbhati can soothe the mind and help to purge negative feelings like anger, jealousy, and hatred.

• This breathing exercise can help you attain emotional balance and increase the level of energy.

• Keeps depression away and brings positive thoughts.

**Steps for Kapalbhati Pranayama**

1. Sit on the flat floor and fold the legs. Keep the spine straight and close the eyes.

2. Keep the right palm on right knee and left palm on left knee.

3. Now take a deep breath and exhale with all force so that the stomach goes deep inside.

4. Do not stress on inhaling. Inhalation should not involve any effort. Inhaling will be done automatically after each exhaling.

5. Repeat these steps.
Benefits of Pranayama

One who practices Pranayama will have good appetite, cheerfulness, handsome figure, good strength, courage, and enthusiasm, a high standard of health, vigour and vitality and good concentration of mind. (Unkule, 2015) Pranayama is quite suitable for the Westerners also. A Yogi measures the span of his life not by the number of years but by the number of his breaths. You can take in a certain amount of energy or Prana from the atmospheric air along with each breath. Vital capacity is the capacity shown by the largest quantity of air a man can inhale after the deepest possible exhalation. A man takes fifteen breaths in a minute. Total number of breaths comes to 21,600 times per day.

Other benefits are as follows:

1. It makes the life meaningful and social.
2. It keeps the man balanced in all the conditions and situations.
3. It helps in understanding the real nature of man and its relationships with the community.
4. It manages psycho-physical diseases.
5. It makes the body healthy.
6. It helps in controlling the modalities of mind.
7. It gives opportunities to the soul to flourish.
8. Intellectual development is accelerated.
9. Will power becomes strong through its practice.
10. It develops feelings of national and international well-being.
Other benefits of Pranayama

Reduced Breathing Rate: - With yoga breathing you can train yourself to breathe more slowly and more deeply. You can reduce your breathing rate from about fifteen breaths a minute to 5-6 breaths a minute, which amounts to reducing the breathing rate by one third. Reduced breathing rate leads to:

- Slowing down the heart rate as more oxygen can be pumped even with less number of breaths. Follow the ratio of 1:2 for inhalation: exhalation.
- Reduced wear and tear of internal organs.
- Lowering of blood pressure, relaxation of body tensions and quieter nerves.

Pranayama Practice Increases Life: - As per yoga philosophy, longevity depends on your breathing rate. Lowering of breathing rate is likely to increase your life. For example, a tortoise takes four to five breaths in a minute and it lives up to 200 years or more.

Blood Circulation Improves: - As a result of breathing, the freshly oxygenated blood (during inhalation) travels from lungs to the heart. The heart pumps it via arteries and blood vessels to every part of the body, where in turn it seeps into every tissue and cell. This improves the blood circulation and more oxygen / prana or cosmic energy reaches all parts of your body.

Pranayama for Healthy Heart: - Our heart is the most industrious organ of our body. The heart beats 100,000 times a day. It pumps blood day in and day out non-stop all our life. The health of our heart determines our life expectancy
and quality of life in old age. More oxygen in the blood means more oxygen to muscles of the heart.

**Benefits of Pranayama for Functioning of Body Organs:**

- Better functioning of autonomic system improves the working of lungs, heart, diaphragm, abdomen, intestines, kidneys and pancreas.
- Digestive system improves and diseases pertaining to digestive organs are cured.
- General irritability due to lethargy/ fatigue vanishes.
- By Pranayama practice all body organs get more oxygen, toxins are removed from body; therefore onset of various diseases is prevented. Pranayama strengthens the immune system.

**Better Mental Health:**

- Pranayama practice provides freedom from negative and harmful mental conditions like anger, depression, lasciviousness, greed for money, arrogance etc.
- With Pranayama fluctuations of mind are controlled and it prepares the mind for meditation. With practice of Pranayama, one starts experiencing lightness of body, feeling of inner peace, better sleep, better memory and better concentration whereby improving the spiritual powers/ skills.
Better Breathing Improves the Quality of Life in Old Age:

As a person with sedentary lifestyle reaches middle age, lung tissues tend to grow less and less elastic and lung capacity decreases. Pranayama can help to reduce the effects of the following old age problems:

- Loss of vitality.
- Accumulation of uric acid in the blood stream which often leads to frequent joint pains and discomfort.
- Backaches, headaches, rheumatism, stiffening muscles and joints.
- Proper circulation of blood is impeded by a sluggish diaphragm or hardening arteries.

Practicing the proper techniques of breathing can help you become more aware of your breath and therefore benefits of Pranayama are physical, emotional as well as spiritual. Some other most common benefits of Pranayama (http://www.yogawiz.com/pranayama.html) are:

- Improvement in the rate of breathing
- Reduction in the heart rate as well as the wear and tear of the heart
- Helping the body get rid of excessive fat and weight
- Curing problems that are related to the digestive system
- Enhancing the functioning of several organs, which include the kidneys, pancreas, intestines, diaphragm, lungs and the heart
- Removing the toxins from within the body
- Preventing various diseases by strengthening the immune system
- Getting rid of negative emotions like depression, anger, arrogance and greed
• Improving the circulation of blood throughout the body
• Reducing blood pressure, by relaxing the body and soothing the nerves.

1.1.3 Om Chanting

"Om" or "Aum" is the universal sound that vibrates in the universe. Chanting this sound helps to bring peace and calm to the body, mind and soul by merging the vibrations of the body with that of the universe.(Iyengar G., 2000).

The energy associated with Om is of the unmanifest (nirgun) God principle. The unmanifest energy of God is the same energy used to create the entire manifest (sagun) Universe. As a result, a lot of energy is generated when one chants Om.

Chanting only Om can have adverse effects, if the person chanting it is of a lower spiritual level, as he may not have the capacity to tolerate the spiritual energy generated from the chant.

Either chanting or thinking about 'Om' is supposed to cause a quiet mental state. ‘Om’ is the primordial sound from which all other sounds and creations emerge. In the traditional texts (The Patanjali's Yoga Sutras and Bhagvad Gita), it has been described that when awake and in the absence of a specific task the mind is very distractible and has to be taken through the stages of 'streamlining the thoughts' (concentration or ekagrata), and one-pointed concentration (focusing or dharana), before reaching the meditative state (defocused and effortless single thought state or dhyana). Earlier study suggested that meditation on Om produces a state of an alert rest. In Om meditation, the meditator first concentrates on an Om picture and then mentally chants mantra Om effortlessly and finally expands to an all-pervasive level and goes for
blissful silence. This is one of the techniques which develops tremendous willpower and deliberately cultivates a single thought to the exclusion of all other thoughts. Om meditation begins with concentration on single object and culminates in absorption in that object. Absorption reveals the subtle nature of the object. By knowing it, one is able to know the reality of subtle entities in the universe.

"Om" Mantra or Om is the highest sacred symbol or say word in Hinduism. It is finite as well as infinite. It contains everything from Vedas. Om is the representation of Hindu trinity Brahma, Vishnu and Mahesh. This single word hymn produces the sound and vibration which makes you feel one with the universe. It is considered so divine in Hinduism that they place it before and after every other Mantra.

The scientific reason may be to use the sound vibrations created by chanting Om first to make the rest of the Mantra more effective.

Benefits of the OM Mantra

- Chanting of Om Mantra purifies the environment around the chanter and produces positive vibrations.
- The Om not only gives positive results to the one who is chanting it but to the entire vicinity wherever its vibrations flow.
- It cleanses your aura.
- It takes you to alpha, a meditational state which gives you deep relaxation.
- Your concentration increases when you chant this universal hymn.
• Om chanting removes toxins from your body. It gives you better immunity and self-healing power.
• It improves your concentration and helps you focus on your target.
• The Om chanting improves your voice and gives strength to vocal cord and muscles during old age.
• The Om chanting produces a vibration and sound which is felt in your vocal cord and sinus. It opens a pore which in turn helps in removal of sinus problems gradually and if done in complete faith.
• Om Mantra has a cardiovascular benefit too which keeps blood pressure normal.
• It helps in keeping your emotions controlled and thus by putting a control over emotions leads you to excel in life.
• It is just like any other supplement that will help in the overall development of your body and mind positively without any side effects.
• Regular chanting of Om helps in taking you to a spiritual journey which will only result if it is done daily for a longer period of time.
• Om Mantra chanted in group produces immense positive vibrations which charge up the entire vicinity.
• The attendants feel fully charged up even though a person is completely tired.
• Some people also claim to lose weight through Om chanting as it puts your entire body in work and its vibrations affect you positively hence enhancing your metabolism which leads to weight loss.
• Om cleanses your skin and gives a sunny glow on your face when you chant Om regularly.

• When you tend to chant it regularly you start feeling stronger.

• Spinal cord efficiency is also increased by vibrations caused by sound of ‘Aaaa’, as this sound is generated from abdomen and mainly supported by spinal cord.

• The sound ‘uuu’ is created by vocal cord which affects thyroid glands and throat positively.

• Even a picture of Om purifies the environment around.

• It is said that rubbing hands while Om chanting and putting those charged hands on different parts of body heals or activates those body parts.

• If those rubbed hands are put on your eyes, your eye sight will start improving and if rubbed on your face, it can give you a great personality.

• It is proved that chanting this Mantra improvises quality of water. So before drinking if Om is chanted it puts water crystal in most beautiful sequence, which affects the body beautifully.

• Om chanting is a potent tonic which increases the efficiency of the human organism in a profound manner.

• By chanting this word Om or Aum, one can achieve ultimate self-realization.

• The repetition of Om leads to excellent mental and physical health.

• This chant helps to improve the production of endorphin, making you feel relaxed and refreshed every time.
• It has positive effect on cardiac vascular health, lowering the blood pressure and increasing efficiency of all the cells and organs in the body.

• In essence Om relaxes and rejuvenates the mind increasing concentration and memory and therefore the ability to learn.

• It helps in cleansing the mind, controlling the emotions.

• It reduces the stress levels by supplying more oxygen to the body. So you get relieved from stress related headaches.

One of the most popular misconceptions about "OM" is that it is religious. Iyengar G., 2000) On the contrary, it is the most universal syllable because it neither refers to any particular religion nor God. There have been several theories behind the Om mantra with the most popular explanation being that it was the cosmic sound which initiated the creation of universe (big bang theory). But that alone would not have been sufficient to turn it into a regular practice in Indian culture. As with most of the traditional practices followed in India, this also has a scientific and practical explanation (based on the physics of sound, vibrations and resonance) with some long term benefit and we shall find out what it really is.
What is mantra? In its most rudimentary form, a mantra is made of syllables which exert their influence by means of sound (vibrations). As one would have personally experienced, different syllables have different vibration patterns which affect different parts of the body. Each syllable resonates with certain organ or part of the body.

For example, by chanting “aaaaaa”, one can feel the sensation and hence resonance of nervous system in the stomach and chest region. Chanting “uuuu” creates sensations in the throat and chest region and resonates with them.
Similarly, chanting/humming “mmmm” resonates with the nasal cavity as well as the skull/brain region.

What happens when we concatenate (join together) the above syllables into one mantra? We get the Om mantra which when chanted, sequentially activates the stomach, spinal cord, throat, nasal and brain regions. The energy moves from the abdomen all the way up to the brain, thereby channelizing energy and activating the spinal cord and brain.

One of the most popular claims made by Yogis is that chanting Om mantra improves our concentration, gives peace and steadiness to our mind, reduces mental stress and clears all worldly thoughts. Although those who practise it regularly would have experienced it first hand and affirm the same, scientists were curious to find out more about it and verify such claims with the help of science and technology.

• Om meditation is said to cure many illnesses. The vibrations that it creates give a sense of positivity to our life. It is believed that Om meditation takes you closer to God. Om meditation brings in self-realization and a feeling of oneness with the Lord.

• Om meditation is believed to be a stress buster. It helps in calming the brain. Studies show that meditation also helps in relieving the symptoms of post-traumatic stress disorder. Om meditation works wonders for those with low self-esteem if they practise meditation regularly.

• The word ‘Om’ contains a cosmic positive energy which helps in creating positive vibrations and gives a divine feeling. Among all benefits that
meditation offers, the most important of all is that it helps you relieve yourself from thoughts that obstruct your thinking process. Also, one can practise Sakshi Bhavana while meditating. Sakshi Bhavana is a process in yoga where you witness thoughts coming in and going out of your mind.

**Proper breathing in swimming**

In swimming, breathing is as important as the arm and leg movement. How to impart proper breathing technique is the biggest challenge faced by the coaches. Improper breathing can interfere in swimming as it can cause scissor kicks, poor body position and improper strokes. Short inhalation and continuous and constant exhalation is the recommended breathing technique for swimming. Swimmers have a tendency to hold the breath. This creates tension in the body. Carbon dioxide builds up in the lungs and the chest becomes too buoyant. This causes the legs to sink. Breathing out relaxes the body. (McLeod, 2010)

Similarly, exhaling too quickly will cause the swimmer to gasp for the next inhalation. It is important to exhale slowly. As the face enters the water, the mouth should be slightly open and the air should be allowed to leave slowly.

Thus, swimmers should develop a habit of exhaling longer, almost twice as long as the inhalation. This facilitates more relaxed exchange of air.

**Improving breathing by Omkar Chanting, Anulom-Vilom and Kapalbhati**

As exhalation has a more important role to play while swimming, practicing the Omkar chanting breathing technique is recommended to improve the swimming
performance. (Unkule, 2015) Omkar chanting has several benefits. It has a positive effect on mind, relaxes the mind and removes anxiety. It stimulates the brain centers and makes them more active. It also improves the concentration. This works positively to improve the swimming performance, especially in a competitive scenario.

However, the most important positive effect can be achieved through the technique of Omkar chanting. In Omkar chanting, the inhaled air is exhaled very slowly through the mouth by making a small opening. The sounds ‘A’, ‘U’ and ‘M’ are produced during this exhalation. Thus regular practice of Omkar chanting trains the body to exhale slowly and continuously, which is also recommended for swimming. The inhalation and exhalation becomes a smooth cycle where exhalation is made longer. If the same breathing style is incorporated while swimming then the problems that arise due to holding of breath or due to exhaling quickly can be avoided. In addition it also improves the capacity of the lungs.

Kapalbhati also focuses more on exhalation. However, contrary to Omkar chanting, the breathing out is not slow but it is forceful and rapid. It thus helps to clean up the respiratory tract and allows a smooth and free passage for air while breathing. It also improves the functioning of the lungs and makes them stronger. Anulom-Vilom involves deep inhalation and slow exhalation alternately through one of the nostrils while keeping the other nostril closed. It improves the breathing cycle and helps to keep the nasal passage clear.
Hence, all the above techniques have a positive effect either directly during swimming by improving the breathing technique or indirectly in building the lung capacity and thus can enhance the swimming performance. Proper breathing also plays a vital role in building the stamina.

1.1.4 Swimming

Anatomy of Freestyle Swimming

Arm movement: The arm movement comprises the propulsive, catch and the recovery phase. (McLeod, 2010) Once inside the water, the arm is extended to initiate the propulsive phase. The shoulder blade is then rotated upwards to achieve an elongated position in water. From this elongated position the first part of the propulsive phase begins with a catch. The primary muscle of the chest, the pectoralis major, is involved in generating most of the force that propels the swimmer through the water. In freestyle, the clavicular portion of the pectoralis major generates the initial movements. The primary muscle of the back, the latissimus dorsi, gets into action and supports the movement of pectoralis major. These two muscles are largely responsible for the force during underwater pull, mostly during the second half of the pull. Throughout the propulsive phase, the wrist flexors act to hold the wrist in a position of slight flexion. The catch phase begins when the elbow muscles (biceps brachii and brachialis) start contracting and the elbow bends from full extension to 30 degrees of flexion. The propulsive phase reaches its end when the triceps brachii assist to extend the elbow bringing the hand backward and upward towards the surface of water.
In the recovery phase, the primary shoulder muscles like the deltoid and the rotator cuff (supraspinatus, infraspinatus, teres minor and subscapularis) come into action. These muscles act towards bringing the arm and hand out of the water near the hips and return them to an overhead position for reentry into water. The reciprocal nature of the arm movements in that one arm is in the propulsive phase while the other is in the recovery phase is a distinctive characteristic of freestyle swimming.

**Stabilizers:** There are many muscle groups which assist as stabilizers both during the propulsive and the recovery phase.

1. Shoulder blade stabilizers (pectoralis minor, rhomboid, levator scapula, middle and lower trapezius and the serratus anterior) assist in propulsive forces of the arm and hand and also in repositioning the arm during the recovery phase.

2. Core stabilizers (transversus abdominis, rectus abdominis, internal oblique, external oblique, and erector spinae) assist in the coordinated movement of the upper and lower extremities of the body.

**Kick movement:** The kicking movement also consists of propulsive and recovery phase and is also called as the downbeat and upbeat respectively. The propulsive phase is initiated when the hip muscle called iliopsoas and the thigh muscle known as rectus femoris set into action. The rectus femoris allows the knee to bend, shortly after the hip flexes. The quadriceps (vastuslateralis, vastusintermedius, and vastusmedialis) assist the rectus femoris in supporting the forceful extension of the knee. Similar to the propulsive phase, the recovery
phase begins at the hips when gluteal muscles contract (gluteus Maximus and medius). This is quickly followed by contraction of the hamstrings. For the entire duration of the kicking motion, the foot is bent downwards (plantar flexed position) along with the activation of the gastrocnemius and soleus muscles of the calf.

Correlation between anatomy of freestyle swimming and different Suryanamaskar poses (Modak & Joglekar, 2010)

Each Suryanamaskar pose helps to strengthen or increase the flexibility of the muscles or muscle groups used in freestyle swimming.

- **Pose 1**: Standing with feet together, stretching the arms up and leaning backwards. This is a good exercise for the chest muscles - pectoralis major and serratus anterior, back muscle - latissimus dorsi, shoulder muscles - deltoid and the rotator cuff, and upper arm muscles - triceps.

- **Pose 2 and 9**: Lowering the arms and trunk down, keeping the palms at the side of the feet with fingers open. This pose provides a good stretch to the hip muscles - iliopsoas and the gluteal muscles, thigh muscles - quadriceps and hamstrings, calf muscles - gastrocnemius and soleus and also improves flexibility and strength of the wrist and finger flexors.

- **Pose 3 and 8**: Keeping the right foot and both palms steady on the ground, stretching the left leg backwards, left knee and toes touching the ground, head leaning backwards. This pose helps to improve the suppleness and flexibility of hip muscles - iliopsoas and the gluteal muscles, thigh muscles
- quadriceps and hamstrings, calf muscles - gastrocnemius and soleus and that of the wrist and finger flexors.

- Pose 4: Without changing the position of the hands stretching the legs backwards, legs and arms straight with knees and elbows straightened and toe touching the ground, body in a straight line from head to ankles, facing down. This pose provides strength to the shoulder muscle - deltoid, chest muscle - pectoralis major, upper arm muscles - triceps, the elbow muscle and wrist and finger flexors.

- Pose 5: Bending the arms at the elbows, with the palms and the toes in the same position touching the ground, lowering the forehead, chest and knees to touch the ground simultaneously, pelvic elevated, both elbows drawn towards each other. This pose works on the upper arm muscles - triceps, the elbow muscle and wrist and finger flexors. While swimming, the fingers of a hand are kept close to each other without any gap in between and this pose helps to develop this habit as it involves resting the palms on the floor in the same way.

- Pose 6: Lifting the chest, pushing it out, arms and elbows straightened, shoulders and head leaning backward, eyes towards the sky, waist pulled towards the center, spine in arched position, feet together and knees and toes touching the ground. This pose induces stretch on abdomen muscles - rectus abdominis and internal oblique, chest muscles - pectoralis major and serratus anterior, hip muscles - iliopsoas and the gluteal muscles, thigh muscles - quadriceps and hamstrings, calf muscles - gastrocnemius and soleus and that of the wrist and finger flexors.
• Pose 7: Without moving the palms and toes from the ground, raising the torso upwards, followed by resting the complete foot on the ground, with legs and arms straight, knees and elbows straightened, body forming a triangle, head pulled towards the knees. Here, stretch is induced on the hip muscles – iliopsoas and the gluteal muscles, thigh muscles – quadriceps and hamstrings, calf muscles -gastrocnemius and soleus and helps to strengthen the shoulder, arm, wrist and the fingers. (Modak & Joglekar, 2010)

1.1.5 Adding Yoga to the Swimming Workout

Of the things that make life worth living, swimming ranks high with Ratner. (Ratner, 2008) For him, it is one of the absolute essentials; a refuge, a source of inspiration, guardian and promoter of health, a boon companion. But a shoulder injury cut him off from this lifeline for six agonizing months. Frustrated and fearful of another injury, he returned to the only exercise that gave him the same sensory peace as swimming: Yoga.

After much searching, he discovered Asthanga yoga and found a first-rate teacher. Unlike the more static forms of yoga, Ashtanga flows from one posture to the next. He says that the whole sequence is more like learning swim strokes than calisthenics. At first, it was hard, a really humbling experience.

Ashtanga yoga takes concentration: many of the postures involve gravity-defying balance that relies on complete harmony of body and mind. It gave him a rewarding feeling, close to being weightless in the water. Certainly yoga has a piscine element: Those days he actually slipped through the water more easily, his alignment and flexibility were better than ever.
Swimming kept him in fine trim, but yoga gave his body a far more sinewy aspect, his spine elongated his limbs compact and muscular. Unexpectedly, the vigorous Ujjayini breathing that he learned in the yoga studio translated into greater endurance in the pool. After years of struggling with bilateral breathing it suddenly became effortless.

1.2 Statement of the Problem

Most investigations attempt to assess the value of physical exercises as a means of altering physical efficiency. The activities generally involve higher expenditure and are commonly believed to be effective in contributing to physical fitness and performance. The effectiveness of Suryanamaskar is very distinct, but the review of literature does not reveal many studies investigating the effects of Suryanamaskar on the performance of 50 metre dash in swimming. Swimming performance can be enhanced by improving breathing techniques. The breathing flexibility and strengthening of the muscles along with concentration can be improved in indigenous way by implementing Suryanamaskar, specific breathing exercise and Omkar chanting. Suryanamaskar and Omkar chanting are the easy and very economical ways to implement in the coaching system of the swimming. Therefore the researcher selected the topic for investigation “Effect of Suryanamaskar, Breathing Exercise and Omkar Chanting on Swimming Performance of Swimmers aged 8 to 16 years”
1.3 Significance of the Problem

Swimming is a very competitive sport. Medals can be won or lost by fraction of second. This fraction of second can be materialized by the swimmers to improve performance. Omkar chanting and Suryanamaskar both are useful for improving lung capacity as well as useful for developing concentration. It reduces stress which will further improve the swimming performance in competitive situation. Using Suryanamaskar and Omkar chanting is economical and easy way and it is also indigenous way with no side effect. This proves to be better and effective means for Indian situation.

The awareness about sports and fitness has increased in present society. India is a country that is now ready to participate seems medals, utilizing the atmosphere of sports to enhance total sports field. Maharashtra is also a prominent state in India, which is performing well in the field of sports. Especially in swimming, the progress of Maharashtra state is remarkable at the National level. At the same time, Kerala, Karnataka, Punjab, and West Bengal are the main competitors of Maharashtra. To excel in the sports world, we need to put in lot of efforts by athletes, coaches and researchers. Similarly, to achieve laurels, India needs to increase participation in sports, enhance the techniques of the athletes, better coaches and coaching facilities, well trained nutritionists and indigenous research. The study envisions the use of traditional Indian methods to improve performance. Hence the researcher has used breathing exercises and Suryanamaskar for the improvement of swimming performance.
Researcher thinks that the use of Suryanamaskar postures, Omkar chanting and yogic breathing exercise will be beneficial for a swimmer for the start in a swimming race, entering in the water and covering maximum under water distances. Practices of yogic breathing exercises like ‘Anulom-Vilom’ and ‘Kapalbhati’ will be beneficial in swimming performance enhancement. The modified movements of Suryanamaskar will also be supportive for the starting action in swimming. The Suryanamaskar is a chain of 10 yogic postures (asana) with specific breathing mechanism. Various specific movements and breathing exercises are co-coordinated in Suryanamaskar that will be beneficial to decrease the time and increase the length covered in the underwater part of swimming.

1.4 Objectives of the study

Following are the objectives of the present study:

1. To prepare Suryanamaskar training program.

2. To prepare Breathing and Omkar Chanting training program

3. To compare the effects of Suryanamaskar, and Breathing and Omkar Chanting on 50 metre freestyle swimming performance of different age group boys. (Comparison of Mean performance of Post-test concerned with different treatments)

4. To study the effect of different treatments (Suryanamaskar, and Breathing and Omkar chanting and Control group) on 50 metre freestyle swimming performance of different age group boys. (Pre-test and Post-test comparison)
1.5 Hypotheses

Researcher used two different treatments to improve 50 metres swimming performance of boys of different age groups separately. The objective of the study was to compare the effect of different treatments; hence the researcher stated Null Hypothesis as the researcher was not confident about the difference between the given treatments before starting this study.

1 H₀: There would be no significant difference found between 50 metre freestyle swimming performance of different groups receiving treatments of Suryanamaskar, and Breathing exercises and Omkar Chanting.

1.1 H₀: There would be no significant difference found between 50 metre freestyle swimming performance of under 10 boys receiving treatments of Suryanamaskar, and Breathing exercises and Omkar chanting and control group

1.2 H₀: There would be no significant difference found between 50 metre freestyle swimming performance of under 12 boys receiving treatments of Suryanamaskar, and Breathing exercises and Omkar chanting.

1.3 H₀: There would be no significant difference found between 50 metre freestyle swimming performances of under 14 boys receiving treatments of Suryanamaskar, and Breathing exercises and Omkar chanting.

1.4 H₀: There would be no significant difference found between 50 metre freestyle swimming performances of under 16 boys receiving
treatments of Suryanamaskar, and Breathing exercises and Omkar chanting.

1.5 Researcher was also interested in finding the effect of each program separately on the swimming performance. To test the same, the researcher stated the following research hypotheses

2 $H_1$: Different treatments would be found significantly effective for 50 metre freestyle swimming performance of different age-group boys

2.1 $H_1$: Suryanamaskar program would be found significantly effective for 50 metre freestyle swimming performance of different age-group boys.

2.2 $H_1$: Breathing and Omkar Chanting program would be found significantly effective for 50 metre freestyle swimming performance of different age-group boys.

1.6 Assumptions of the study

For the purpose of this study, it is assumed that –

1) The subjects will cooperate and actively participate in the experiment and testing.

2) Researcher assumed that subjects were not trained in Suryanamaskar, Breathing exercises and Omkar Chanting before the experiment.

3) The administration will provide all the facilities and equipment required for the research.

4) Daily training routine was assumed to be same.
1.7 Delimitations of the study

Delimitations of this study were as follows:

1) The study was delimited to school going boys from Pune city.
2) Age of the subjects for the study was delimited to 8 to 16 years only.
3) The subjects were regularly participating in swimming competitions.
4) The assessment of the subjects was done only for 50 metre freestyle performance.
5) The experimental period was delimited to three months.
6) The study was confined to Pune city only.

1.8 Limitations of the Study

Limitations are those which are beyond control of researcher. The limitations of this study are as follows:

1) The researcher was dependent upon some trained assistants for the purpose of data collection. Although reliability in measurements was assessed, the research still considered it as a limitation.
2) The performance of the subjects in the annual district swimming competition organized by Pune district associations was considered.
3) The researcher could not control the habits, the daily routine and living style of the subjects.
4) The treatment given to the subjects was in addition to their daily training.
1.9 Operational Definitions

Operational definitions for the present study are as follows,

1.9.1 Suryanamaskar

The Suryanamaskar is a set of 13 Suryanamaskar consisting of flowing series of 12 poses of seven asanas performed in eight and half minute with the help of specially prepared music. For standardization of activity, Suryanamaskar will be performed in a universal manner to the 10 digit counts. Total Time for one Suryanamaskar is 30 seconds approximately.

1.9.2 Breathing Exercises

Anulom-vilom and Kapalbhati Pranayama performed in a prescribed manner is called as breathing exercise. Anulom-Vilom Pranayama (Unkule, 2015) is defined as a breathing technique in which one takes deep breath with one nostril open and the other closed by using fingers followed by releasing the air by the other nostril which was closed while inhaling the air and closing the other nostril by use of fingers. In the next step, a deep breath is taken by the nostril through which air was exhaled last time and the air is exhaled through another nostril.

In Kapalbhati, Kapala is the word for Skull and Bhati means ‘to shine’. Thus, together the word means an exercise that brings a shine to the skull. Kapalbhati is about short, forceful exhaling. This is an abdominal breathing exercise.
1.9.3 Omkar Chanting

After a deep breath-in, the subject breathes out with the ‘A’ ‘U’ and ‘M’ sound in a rhythm. This type of ‘Omkar’ sound is referred to as Omkar chanting in the present study.

1.9.4 Swimming Performance

It is the total time taken (i.e. above the water and below the water) by the subject to swim 50 metres by freestyle in competitive situation.
References


