Chapter I

INTRODUCTION

“The one who is temperate in his habits of eating, sleeping, working, and recreation can mitigate all material pains and which can be minimized and prevented by practicing the art of yoga.”

– Lord Krishna in the Bhagavad-Gita (6.16-17)

India is a holy land with rich customary rituals and practices performed by Indians right from Indus Valley civilization. The archeological evidences from Indus Valley civilization had portrait the practice of yoga. Yoga has undergone drastic changes and modifications in yoga. The modern yoga practiced by us was introduced around the world by great personalities. In particular yoga was introduced by Swami Vivekananda in 1893 at Chicago, United States of America during parliament of Religion.

The sedentary life style of humans created health havocs and created weaker nation. This worried the health professionals, reformers and initiated and developed a movement called physical culture around various parts of the world. This constitutes numerous exercises like traditional games, military training, sports and games. Indians has
forecasted similar problems but they countered with healthy diet and yogic practices.

Traditionally, Indians have very rich lifestyle by having nutritious diet and adequate amount of physical exercise. The standard of living at 3000 B.C was clearly mentioned in Ajur Veda which is a collection of health and medical facts and gave raise to Yoga. This gave a beautiful series of stretching and flexibility posture to tone their body physically and physiologically. The secret behind the yoga was developed by coining principles in 600 B.C. in the Upanishads and in later in the Yoga Suthra by Patanjali between 200 B.C. and 200 A.D. In India during this period, the linking of exercise and health may have led to the development of a medical subspecialty that today would find its equivalent in sports medicine (Snook, 1984).

The most ancient and refined systems of health self care originated in India is Yoga/Pranayama. It is a composite activity like breathing, stretching, relaxation, massage, concentration and meditation exercises has been identified and recognized this ancient health care system and pores special attention now. Science has currently recognized the value and importance of yoga to the world. It appears that broad spectrums of
physiological and bioenergetic events are triggered by Yoga and that these mechanisms can be modified and refined by conscious and concentrated practice.

Yoga a gentle approach to enhance awareness, increase flexibility, deepens the breath, and connects to one's true nature. An emphasis on pranayama (breath work) is integrated with yoga asanas (postures). Plenty of warm-up exercises, including somatic therapy and PNF (Proprioceptor Neuromuscular Facilitation) are incorporated to free up the body-mind.

Yoga

"Yoga is a term which has its origin from Sanskrit language and is merely the process of paying attention and exploring the movement toward balance and union of body, mind, and spirit. Yoga as a system primarily of exercises along with appropriate breath control exercises designed to bring the harmony and synchronization of body, mind, and spirit of humans".

Yoga is one of the six systems of Indian Philosophy. It was collected, coordinated and systematised by patanjali in his classical work, the yoga sutras. There are various systems of yoga to catering the needs of the different types of people to
bring about the transformation of the individual. One of the important systems of yoga is raja yoga. It is the royal yoga, because the practitioner becomes the ruler of the mind. Patanjali enumerated eight limbs or stages of yoga.

The origins of yoga have been traced as far back as the ancient rishis, 8000 years ago (Feuerstein, 1998). Over many centuries different forms of yoga developed that have been used to restore and maintain health and to elevate self-awareness and consciousness. In ancient days pranayama means breathing exercise. It has been identified and recorded pranayama as control of energy and expansion of energy (Sovik 2000).

‘Prana’ means all forms of energy such as cosmic energy, mental energy, physical energy etc. It is loosely translated as breath. ‘Ayama’ is control. Hence, Pranayama is control of breath or discipline of breath or rhythmic control of breath. The three main steps of pranayama are a) Inhaling: take as much air as possible, b) Retaining of the breath: retain the inhaled air for half of the time taken in inhaling and c) Exhaling: Gradually exhale the air in almost the same time as taken for inhaling. If the breath is controlled which in turn it calms down the mind and simultaneously keep the senses motionless. Pranayama
raises the practitioner to that state of silence rarely experienced in normal everyday life.

Pranayama means control of breath and it involves three main phases. It is much more important to keep sound health. According to the hatha yoga pradipika pranayama should be practiced four times a day with 80 cycles in one session. These are best practiced in the early hours of the morning or after sunset. During pranayama practice, make use of the diaphragm fully by drawing the air into the lowest and largest post of the lungs. Due to regular practice of pranayama a) the respiratory efficiency is improved, b) vital capacity of the lungs is increased, c) during kumbhaka, there is a slowing down of heart rate, d) the training to tolerate mild hypoxia e.g. during kumbhaka can stimulate the myocardium to increase its vasculaisation as recorded at higher altitudes and e) synchronisation of different activities of the organism with respiration is increasing. Hence, systematic practice of pranayama is useful for all players. It is more useful for players who compete in aerobic activities.

The facts of pranayama took wider attraction on western countries after eliciting the potentials to relieve psychological problems like anxiety, depression, stress, et cetera. However, the research remains in infancy stage in our country and other
countries. In addition, they may provide new approaches to the treatment of behavioural disorders of children, attention deficit disorder, violence, alcoholism, and rehabilitation of prisoners and terrorists.

It has been proved that practicing yoga and pranayama has revitalizing humans from stress related mental and physical disorders (Becker, 2000; Benson, 1996; Jacobs, 2001). Reduced sympathetic and increased parasympathetic nervous system activity has been implicated in such therapeutic action.

Yogic breathing provides a unique and powerful tool for adjusting imbalances in the autonomic nervous system and thereby influencing a broad range of mental and physical disorders (Sovik, 2000). By voluntarily controlling breathing patterns, it is possible to influence autonomic nervous system functions, including heart rate variability and cardiac vagal tone (Fokkema, 1999; Lehrer et al., 1999; Sovik, 2000). Pranayama are forms of voluntarily controlled breathing exercise. Practicing of pranayama can produce uplifting in psychological and physiological parameters which display greater amplification to appropriate selection of pranayama type and duration (Telles & Desiraju, 1992).
Human physiological functions are controlled by central nervous system, more specifically sympathetic nervous system, is affected by how we breathe. Rapid and shallow breathing depletes carbon dioxide, which causes the sympathetic nervous system to become activated. This results in increased heart rate and blood pressure, which leads to sweaty palms and feet, high levels of anxiety (the flight or fight syndrome), and more. Yoga breathing is an effective method that helps restore and maintain normal carbon dioxide levels.

Yoga exercises become more comfortable and powerful when inhalation and exhalation flow freely. The subtle flowing of air into and out of the nose stimulates a relaxation response, which directly affects the brain and nervous system. Breathing through the nose also warms and filters the air further reducing its impact upon the nervous system. Normal breathing oxygenates the blood and removes the noxious byproducts of metabolism and respiration. Controlled yoga breathing (pranayama) when appropriately practiced accelerates this process.

It is clear that each humans has to practice pranayama to derive maximum benefit of it. Regular and systematic practice
of pranayama leads to improve the physiological functions of players too, without damaging the body and mind.

**Yoga for women**

Women undergo physical change right from her puberty. After puberty her body and mind undergo several changes in physical and physiological changes due to work pressure stress. The physical and psychological stress can produce lethal effect on their health in order to minimize the effect yoga can be administered which can achieve peace of mind and rejuvenate their internal systems.

Women right from the birth undergo several physiological changes during her life span, an awareness of the modifications necessary to achieve balance on their physiological systems. However, practice of yoga asana and pranayama under the guidance of qualified teacher can bring greater modification on their integral part of life.

**Anulom Vilom Pranayam**

Anulom Vilom Pranayam is simplest breathing exercise used for improving physical and mental health. It has potential to cure several internal body diseases with allopathic medicine. It has the ability of minimize the stress of body and
mind by practicing for stipulated period. The practitioners can experience joy and full of happiness with positive approach in their life. Anulom Vilom pranayama is also known as Nadi Shuddhi pranayama.

While practicing anulom vilom pranayama certain specifications has to be followed like starting with left nostril and close the right nostril with the right hand thumb to block the inhalation through right. Begin the inhalation slowly and fill the lung completely (*Puraka*) followed which close the left nostril with the second and third finger and open the right nostril to exhale but it should be performed slowly (*Rechaka*). Exhalation should take place until emptying of the lung takes place. When they perform both inhale and exhale it is considered as one cycle. Then begin with right nostril and perform similarly as like that of the left side.

Anulom vilom pranayama has to be practiced slowly at the beginning as they practice daily can try to increase the number of cycle and speed of inhalation and exhalation gradually. After attaining this stage slowly add meditation by repeating mentally the mantra “*OM*” which nourishes with extra effect of concentration and attention for all participants.
Statement of the Problem

Today the life style of the young women has drastically changed due to inactive due to modernization. The cause for inactive are television viewing, computer games, games in mobile and tablet, is suspected to be responsible for the decline in physical activity levels as result they are more prone to diseases and young age mortality. In order to minimize the effect pranayama can be administered to improve their life span. Pranayama includes breath practices where there is no body movement except of the breathing apparatus itself. Several researches suggest that simple breathing techniques can increase the absorbing rate of oxygen to the blood. Individuals who are restricted in their movement due to health problems may have access to some of the benefits that have traditionally been reserved for those who do not do vigorous exercise. However, the efficacy of pranayama on physiological variables is yet to be explored. Hence, in this investigation, the effect of Anuloma Viloma pranayama on physiological variables (pulse rate, systolic blood pressure, diastolic blood pressure, vital capacity, resting respiratory rate, breath holding time and cardiovascular efficiency) among female of different age category is to be reviewed.
**Delimitations**

1. In this study, ninety (90) female subjects were selected and their age ranging between 21 to 35 years.

2. Further, the selected subjects were classified into three groups based on their age as **Group 1**: 21 to 25 years, **Group 2**: 26 to 30 years and **Group 3**: 31 to 35 years each constitutes thirty (30) subjects.

3. This study is restricted to Anuloma Viloma pranayama practice daily in the morning between 06:00am to 07:00am for three months.

4. The criterion variables chosen for the present study were pulse rate, systolic blood pressure, diastolic blood pressure, vital capacity, resting respiratory rate, breath holding time and cardiovascular efficiency.

5. The testing of criterion variables before and after the experimentation took place almost at the same time of the day for each subject to control circadian variation.
Limitations

The following were considered as the limitations of the study on which the investigator have no control.

1. Non availability of sophisticated instruments will be considered as limitation of this study.

2. The subjects’ socio-economic status, health habits and family back ground were not taken into consideration.

3. The growth and development of the subjects, if any during the training and period could not be controlled.

4. Physiological data obtained may be affected due to menstrual cycle.

Hypotheses

It was hypothesised that:

a) There would be significant transformation of selected physiological variables (pulse rate, systolic blood pressure, diastolic blood pressure, vital capacity, resting respiratory rate, breath holding time and cardiovascular efficiency) as a result of Anuloma Viloma pranayama training for three months.
b) The efficacy of Anuloma Viloma pranayama training on selected physiological variables (pulse rate, systolic blood pressure, diastolic blood pressure, vital capacity, resting respiratory rate, breath holding time and cardiovascular efficiency) would differ significantly among female of different age category.

Definition and Explanation of the Terms

To have better comprehension and clarity of the problem under study, the following terminologies are defined.

**Physical Fitness**

Physical fitness is defined as ability to carry out daily tasks with vigour and alertness without undue fatigue with ample energy to enjoy leisure time pursuits, to meet unusual situations and unforeseen emergencies.

**Training**

Training is the systematic process of repetitive progressive exercise or work involving also learning process and acclimatization (Arnheim, 1985).
**Yoga**

A Hindu spiritual and ascetic discipline, a part of which, including breath control, simple meditation, and the adoption of specific bodily postures, is widely practised for health and relaxation.

**Pranayama**

The ancient yogis advocated the practice of pranayama to unite the breath with the mind, and thus with the *prana* or life-force. *Prana* is energy, and *ayama* is the storing and distribution of that energy. *Ayama* has three aspects or movements: vertical extension, horizontal extension, and cyclical extension.

**Anuloma Viloma**

Anuloma Viloma is a breathing technique. In Sanskrit Anuloma means with the natural order and Viloma means going against. Thus it is called alternate nostril breathing technique.

**Maximal Oxygen Uptake**

It is the maximal capacity for oxygen consumption by the body during maximal exertion. It is also known as aerobic power, maximal oxygen consumption, and cardiorespiratory endurance capacity (Wilmore & Costill, 1994).
**Pulse rate**

The rate of the arterial pulse usually observed at the wrist while sitting and stated as number of beats per minute.

**Systolic blood pressure**

The greatest arterial blood pressure, resulting from systole (the contraction phase of the heart) is systolic blood pressure.

**Diastolic blood pressure**

The lowest arterial pressure, resulting from ventricular diastole (the resting phase) is diastolic blood pressure.

**Vital Capacity**

According to Shaver (1982), Vital capacity is the maximal volume of air that can be forcefully exhaled from the lungs following a maximum inspiration.

The volume of air that can be made to pass in and out of the lungs by the most forcible inspiration and expiration is termed as vital capacity (Subramanyam & Madhavankutty, 2001).

The vital capacity is the maximum volume of gas that can be expelled from the lungs by forceful effort after a maximal inspiration. The vital capacity is also the sum of the tidal
volume, inspiratory reserve volume, and expiratory reserve volume (Cromwell, Weibell & Pfeiffer, 2002).

**Resting respiratory rate**

The resting respiratory rate is the number of breaths (inhalation-exhalation cycles) taken within 60 seconds.

**Breath holding time**

Breath holding time is defined as the time taken by the subject to hold his breath as long as he can.

**Cardio respiratory endurance**

The ability of the body to sustain prolonged exercise is known as cardio respiratory endurance.

**Significance of the Study**

1. The outcome of this investigation would reveal the degree to which the cardiovascular and respiratory variables of female subjects are influenced by Anuloma Viloma pranayama practices.

2. The findings of the study would be of great value to understand the usefulness of pranayama in improving cardiovascular efficiency.
3. The result of the study would highlight the impact of Anuloma Viloma pranayama practices on selected physiological variables with respect to different age subjects.

4. The results of this investigation would guide the physical educationist and coaches to design Anuloma Viloma pranayama practices for sportspersons and others.

5. The findings of this study would be of great significance and to the body of knowledge in the field of physical education and sports.