CHAPTER I

INTRODUCTION

According to National Plan of Physical Education and Recreation. "The aim of Physical Education is a must, to make every child physically, mentally and emotionally fit and also to develop in him or her personal and social qualities as will help them to live happily with others and build them up as a good citizen."

Generally, Physical Fitness can be classified into two categories: Health-related fitness and Motor skill related fitness. Physical Educators have long believed that exercise is important to maintain good health. Today degenerative diseases like Cancer, Heart disease, Strokes have replaced communicable disease like tuberculosis, Pneumonia as leading death. Medical Research shows that poor aerobic fitness, obesity and lack of development of certain types of muscular strength, flexibility are related to certain disease.

Health related Physical fitness is defined by the following components such as Muscular Strength & Endurance, Cardiovascular Endurance, and Muscular Flexibility and Body composition. The motor skill-related aspect of physical fitness is a greater significance in athletics. General Motor ability has been considered as one’s level of ability in a wide range of activities. It has been thought of as an integrated composite of such individual trait such as Agility, Balance, Coordination, Power, Reaction time and Speed. This level of fitness covers an most of the Physical and Physiological parameters.
The investigator interested in the field of Dands Baithaks and Yogasanas practices among school level boys for the improvement of basic and specific physical fitness variables such as Muscular strength and endurance, Flexibility and Physiological fitness such as cardio vascular fitness and anaerobic power.

Muscle strength declines with advancing age, starting at the beginning of the sixth decade, and the power-type strength, i.e. the capacity to produce explosive muscle force, declines more drastically than the maximal muscle strength. Muscle power, which is the product of the velocity and force of muscle contraction, is needed for performing daily habitual tasks and activities. Recently, Anton et al., (2004) demonstrated similar age-related declines both in the arm and leg muscles.

The extent to which the individual develops his own potential for fitness depends upon his daily living practices and exercise habits. Adequate nutrition, sufficient rest and relaxation, suitable work and appropriate medical and dental care are also important in maintaining fitness, flexibility and circulatory-respiratory endurance. In fact, properly directed exercise is the only known means for acquiring the ability to engage in task demanding sustained physical effort. For this reason, physical education is indispensable in schools and colleges in order to develop strong and enduring bodies. Clarke and Clarke (1978)

Fleishman (1964) says that when the inter-correlations among tests of strength were statistically analyzed three broad factors emerged, namely, Explosive strength, Dynamic strength and Static strength.
Explosive strength factor is an ability to exert maximum energy in one’s explosive act. It has also been called “energy mobilization” or “power” or “vigorous” in some studies. The factor can be distinguished from other strength factors in that it requires one short burst or effort rather than a continuous stretch on repeated exertion.

This form of exercise claims a special advantage in the acquirement of health. It brings into play all the nerves of the body. Practice in Dands enables a person to strengthen his heart, according to his capacity.

The most features of Dands and Baithaks is that they have done rhythmically and at steady phase. One can do and practice as many as to improve strength, focus and mental clarity by increase in numbers. Dands and Baithaks are two different exercises but together constitute the core wrestling Vyayam regimen. Dands are Jack Knifing pushups and Baithaks comparable to western style knee bend. One start a baithak from a standing position with feet set to 45 angles and heals about 15cm apart. One’s eyes should be fixed on a point about 4 metres forward. Among 2000 to 3000 Baithaks a day by champions helps to attain personal strength, prediction and specific goal Dands are similar to certain aspect of Suriya namaskar. Dands start by facing down position (prone) with feet placed together and palm flat on ground directly below the shoulder half a meter. There are many, about 5000 dands are practiced in exceptional by wrestlers. In most sports Dands are practiced after the morning practice session. Some practice both Dands and Baithaks in evenings.

Dands and Baithaks make the muscle of the body. So incredibly strong that the wrestling appears divine. Dands and Baithaks are the minor in which
The auro of wrestling reflected. They are the two flowers which are offered to the “wrestlers God”. Dands and Baithaks are two sacrifices made to Goddess of wrestling. Alter (1974)

The age old Vedas have also sounded the strength, as one of the components of the physical fitness programme. This could be assessed in the following words “Balana Vai Prithivdei Testate, Balan Upaswa” (the world stands Protected by strength, worship strength). Thirunarayanan and Hariharasarma (1985)

Mohimker (1952) says that Dands and Baithaks are peculiarly indigenous exercise which goes to secure strength and development of whole body. Dands are valuable for developing strong arm and chest, and Baithaks helps in developing strong legs.

“Dands give exercise to all limbs within a short time and deserve to be practiced by everybody. In Western countries follows various forms of physical exercises in which some type of Dands are incorporated in other countries and also advocate Indian Dands exercises owing to their remarkable effect.

The group of muscles involved in the performance of Muscular strength and muscular endurance and exercise in Dands are more or less the same. The following are the important muscles Gastrocnemius, hamstring, abdominal muscles, lastisimus dorsa, trapezius, pectoralis major and pectoralis minor, deltoid, biceps, triceps, forearm muscles, wrist and palm muscles. That is involved in the performance of Muscular strength and muscular endurance.
“Baithak exercise is supplementary to Dands. Dands give a prominent shape particularly to arms, chest and abdomen. Baithaks shape the calf muscles and thigh muscles. Generally, Baithak exercises develop quickness of body movements and repetition increases the stamina.

Wrestles were expected to practice the applications of tricks in the morning every day to acquire skill, stamina and confidence in wrestling. To increase their strength, and they practiced a sort of weight lifting. They lift heavy socks full of sand with their hands and use to push and strike them with their feet. This exercise made their hands and feet ideal strong. They could increase their weight, strength and stamina without accumulating unnecessary fat on their bodies. This exercise is called Bharshrama. It reduce weight and at the same time increase strength and stamina and tended to store surplus energy which is useful in emergency. Good Wrestling is “A Fusion of Brain and Brawn” The Greek Ideal of life was a balance of brain and muscle, the harmony of mind and body. Namaskar exercise makes a body beautiful and when Dands and Baithaks added to this it makes graceful. Ramdas in his well known book of Dasabodhs, praised strength in the following words “Strength leads a person to happiness” A person without strength becomes an object of ridicule and is easily over powered by diseases. Strength makes the body handsome. Strength enables a person to enjoy to the full extent the worldly pleasures. A person without strength is helpless. Strength enables to conquer kingdoms. Strength accompanied with skill attracts all and is reverted by all. It leads a person to self-confidence, courage and brave acts. (Majunder,Encyclopedia of Indian Physical culture).
The great Nalanda and Takshasila universities which were prominent in Ancient and medieval India, had physical fitness programmes for 10,000 students at a time in the form of Indigenous activities and gymnastics of Indian origin.

The practice of yoga started nearly six thousand year ago, the earliest written records documenting yoga as a health practice are recorded in the Vedas (The most sacred Hindu scriptures).

Our ancient stages have suggested eight sages of yoga to secure purity of body, mind, soul and final communion with God. These eight stages are known as Ashtanga Yoga.

Yoga practices can scientifically be evaluated in two ways: in a clinical sense and as a socially operating healthy life style program. The dominant style of scientific evaluation research is the clinical approach which involves the construction of control groups, a firmly circumscribed experimental factor and the intention to control as much as possible all causal factors. Such an approach has both advantages and disadvantages. A major disadvantage is that yoga is mostly taken out of its natural setting and the needed control activities of the researcher interfere with the natural practice of yoga, possibly disturbing it fundamentally. Another disadvantage is that the methodological premises of this approach are based upon a classical notion of science (deterministic, causal thinking) which does not fit well with new theoretical concepts in the basic and health sciences (Foundations.1989). We propose therefore to complement the clinical type of yoga-research with another type of evaluation research, which would have a broader scope and lead to a more social and cultural, instead of a pure clinical, appraisal of yoga. The third limb
of yoga is asana or posture. Asana brings steadiness, health and lightness of limbs. A steady and pleasant posture produces mental equilibrium and prevents fickleness of mind. Asana are not merely gymnastic exercises they are postures. Asana have been evolved over the centuries so as to exercise every muscle nerve and gland in the body which includes fine Physique and keep body free from disease.

Yoga is the science of right living and as such, is intended to be incorporated in daily life. It works on all aspects of the person, the physical, vital, mental, emotional, psychic and spiritual. Yoga aims at bringing the different bodily function in to perfect co-ordination so that they work for the good of the whole body. **Swami Satyananda Saraswathi** (2002)

Suriya namaskar integrate and harmonize all aspects of the physical, intellectual, and spiritual body. Positions are related to energize pituitary, pineal and thyroid gland, liver solar pineal, blood flow to organ and glands efficacious for the neck, chest, abdomen and sexual gland. The regular performance of Suriya namaskar is intended to raise one’s state of conscious to higher level of realization.

Suriya namaskar are mostly more popular in older men than young wrestlers. They strengthen body without strain in bones and organs of the body. Suriya namaskar are not vigorous, but they are practiced to maintain physique.

Physical and physiological developments determine one’s abilities, capacities and potentialities that an individual does exhibit. There are various physiological factors such as aerobic capacity, anaerobic power, cardio respiratory endurance which determine the physiological development as a
whole. Since the cardio respiratory system involves lungs and heart, it was considered worthwhile to study.

All physical activities can be broadly divided into two – Aerobic and Anaerobic. This classification is based on the type of reactions involved in the release of energy needed for the activity.

Aerobic (with oxygen) endurance is generally characterized by moderate contractions of large muscles groups for an extended period of time, during which maximum cardio-respiratory adjustments are necessary, as in swimming, bicycling and distance running. Since aerobic endurance refers to the ability of the heart, vascular system, and lungs to provide oxygen and nutrients to the working tissues and to remove the waste products of metabolism, it is quite clear that the primary goal of the aerobic endurance training is to improve and/or increase the capacity and efficiency of these three system in order to generate amount of oxygen supplied to the cells. This type of training is often referred to as cardio-respiratory or cardio-vascular training.

Anaerobic (without oxygen) endurance is generally characterized by strong contraction from activities that require energy at such rates from the breakdown of the ATP_CP and glycolysis system that aerobic metabolism cannot possibly provide. Such athletic activities included stop-and-go sprints in basketball, tennis, ice hockey, soccer, lacrosse, field hockey, and football, sprint events in track and swimming as well as in cycling, weight lifting, boxing and wrestling and other everyday activities’ such as lumber-jack cutting wood or shoveling snow rapidly to clear your driveway. Because the ATP-CP and glycolysis energy systems are tremendously important to anaerobic
endurance, the development of them to their fullest is the major goal of anaerobic endurance.

In school level the Physical Education programmes should be designed to attain the Aerobic and Anaerobic fitness, some schools may be having playground facilities to accommodate more number of students to train for their related sports. This study may result to impose the training method on Dands Baitthaks exercises and Yogasana movements to get their optimal fitness on strength, Endurance, Flexibility, Aerobic capacity, Anaerobic power, and other physiological parameters.

STATEMENT OF THE PROBLEM

The purpose of the present study was to find out the effects of isolated and combined training of Dands Baitthaks and Yogasanas on specific Physical and Physiological variables among school boys.

HYPOTHESES

The researcher had gone through various related research studies completed on this area. Based on the available literature, keeping the above logical concepts, the following hypotheses have been formulated.

It was hypothesized that:

1. There would be significant differences due to the influence of Dands Baitthaks on physical variables such as shoulder muscular strength and endurance, abdominal Muscular strength and endurance and flexibility for school boys.
2. There would be significant differences due to the influence of Dands Baithaks on Physiological variables such as Aerobic capacity, Anaerobic Power, Breath holding time and Resting Respiratory Rate for school boys.

3. There would be significant differences due to the influence of Yogasanas on Physical variables such as shoulder muscular strength and endurance, abdominal Muscular strength and endurance and flexibility for school boys.

4. There would be significant differences due to the influence of Yogasanas on Physiological variables such as Aerobic capacity, Anaerobic capacity, Breath holding time and Resting Respiratory Rate for school boys.

5. There would be significant differences due to the influence of combined training of Dands Baithaks and Yogasanas on Physical variables such as shoulder muscular strength and endurance, abdominal Muscular strength and endurance and flexibility for school boys.

6. There would be significant differences due to the influence of combined training Dands Baithaks and Yogasanas on Physiological variables such as Aerobic capacity, Anaerobic power, Breath holding time and Resting Respiratory Rate for school boys.
DELIMITATIONS

The study was delimited in the following;

1. For the purpose of this study eighty School boys were selected at random from the High and Higher Secondary Schools around the Puducherry region.
2. The study was confined to the age group of 13 to 16 years only.
3. Physical variables were delimited to Shoulder muscular strength and endurance, abdominal muscular strength and endurance and flexibility
4. Physiological variables were delimited to aerobic capacity, anaerobic power, breath holding time and resting respiratory rate.
5. Selected subjects were divided into four equal groups namely experimental group ‘A’ underwent Dands Baithaks training, Group ‘B’ underwent Yogasanas training, Group ‘C’ underwent combination of Dands Baithaks and Yogasanas training and Group ‘D’ served as Control group.
6. The duration of the training period was restricted to twelve weeks and the number of days per week was confined to three days.
7. The level of significance was fixed at 0.05 levels, which was considered to be appropriate.

LIMITATIONS

The study was the following limitations;

1. No effort was put in order to find out the effect of environmental changes during pre and post tests and the training period. However, dry weather prevailed mostly.
2. Though the subjects were motivated verbally, no attempt was made to differentiate their motivation level during the testing and training period.

3. Since the subjects were non-hostellers, the investigator did not take any effort to control and assess the quality and quantity of food taken by everyone.

4. Previous physical training in sports and games were not taken into consideration.

5. No effort was made either to control or assess the quality of the food ingested, the quantum of physical exertion, lifestyle psychological stresses and other factors which are recognized as limitations of this study.

6. Changes in atmosphere pressure, temperature, relative humidity and such other meteorological factors during the period of administering the test could not be controlled of assessed, and their possible influence on the selected physical, physiological test performance was also regarded as a limitation.

7. Heredity and environmental factors which contribute to psychological, physiological and sociological factors have not been controlled.

8. The internal and external factors which may discourage or motivate the participants while performing physical, physiological and psychological tests are not been controlled.

9. No special motivation techniques were used during the test. Therefore the difference that might have occurred in the test due to lack of motivation was recognized as a limitation for this study.
DEFINITION AND EXPLANATION OF THE TERMS

Exercise

The word exercise refers to conscious and purposeful physical activity. Usually a sufficient intensity is going with it. To increase to some degree respiratory and circulatory function.

Dands Baithaks

According to Mohimker (1952), “Dands Baithaks are peculiar indigenous exercises which sow for the improvement of strengths and development of the strong body and soul. Dands are valuable for developing strong legs. Dands and Baithaks are practiced all over our country by those who are enthusiastic about their body development. These practices are very common with wrestlers who practice them religious with a view to develop big muscles and general strength.

Yoga

Yoga is the time less pragmatic sciences evolved over thousands of years dealing with the physical, moral mental and spiritual well being of man as a whole. Iyengar (2000)

Yoga essentially means the integration of personality at all possible levels; Physical, mental, social, intellectual, emotional and spiritual. Gharote (1990)

Asanas

Asanas are not movements, but postures to be developed and held: most are relaxing rather than demanding effort, refreshing rather than fatigue.
They are non competitive, they require no special equipment or clothing they can be performed by men and women of all age groups. Hewitt (1985)

Strength

According to Hockey (1973) strength may be defined as “The force, a muscle can exert against a resistance in one maximal effort”. It is measured in units of pounds or kilograms.

Muscular Strength

According to Mathews (1973) “Muscular strength is defined as the force that a muscle or a group of muscle can exert against a resistance in one maximum effort”.

According to Hardayalsingh (1991) Strength endurance is the ability to overcome resistance or to act against resistance under the conditions of fatigue.

Endurance

According to Barrow and McGee (1979) Endurance is the result of a physiological capacity of the individual to sustain movement over a period of time.

Muscular Endurance

Hebbelink and Day (1980) have defined muscular endurance as the ability of muscular groups to exert repeatedly a sub maximal amount of force (dynamic or to maintain a sub maximal contraction tests such as chinning, push-ups, sit ups (dynamic) or flexed arm hang (static).
Cardio respiratory endurance is the ability of the lungs and heart to take and transport adequate among of oxygen to working muscles which allow activities involving large muscle groups to be sustained for long period of time.

**Flexibility**

Flexibility is defined as the ability to perform movement with greater range of motion or large amplitude [Uppal](2001) (2001)

According to the [Hockey](1989) (1989) Flexibility can be defined as the capacity of a joint to move freely through a full range of motion without undue strain.

**Aerobic**

Aerobic activities are those activities which are carried in a slow and steady manner whereby the circulo-respiratory system is able to supply ample amount of oxygen to the working muscles. These are endurance type of activates and can be continued for a long time without undue fatigue.

In aerobic activities the oxygen is made available easily to the musculature and in adequate quantity so as to sustain muscular activity under stress. [Baumgartner and Jackson](1987) (1987)

**Anaerobic**

Anaerobic activities are high intensity short duration, explosive type of activities during which the circulo-respiratory system will not be able to supply the full amount of oxygen needed by the working muscles. Hence, an individual will not be able to continue aerobic work for more than two minutes. [Baumgartner and Jackson](1987) (1987)
**Anaerobic power**

Anaerobic power is the amount of work performed using primarily anaerobic energy systems *Baechle* (1994).

Anaerobic power refers to two anaerobic energy system, adenosine triphosphate (ATP) – Creatine phosphate and Anaerobic glycolysis *Garrett* (1999)

**Breath Holding Time**

Breath holding is defined as the duration of time through which one can hold his breath without inhaling or exhaling after a deep inhalation. *Chaterjee* (2003)

**Resting respiratory rate**

According to *Chaterjee* (1980) respiration is the act or function of breathing by using the diaphragm and abdominal muscles. Respiration includes two movements’ inspiration and expiration. Inspiration is active movement where as expiration is a passive movement. The respiration goes on with alternate inspiration and expiration movement and is about 14 to 18 per minute.

**THE SIGNIFICANCE OF THE STUDY**

The findings of the study will explore the level of abdominal muscular strength and endurance, shoulder strength and endurance, flexibility, aerobic capacity, anaerobic power, breath holding time and resting respiratory rate.

1. The study will reveal the response of practicing Dands Baithaks and Yogasanas on Shoulder muscular strength and endurance, Abdominal
muscular strength and endurance, flexibility, aerobic capacity, anaerobic power, breath holding time and resting respiratory rate.

2. The result of the study will be useful to know the response of combined practice of Dands Baithaks and Yogasanas, on shoulder muscular strength and endurance, abdominal muscular strength and endurance, flexibility, aerobic capacity, anaerobic power, breath holding time and resting respiratory rate.

3. The study will be helpful to compare the response of practicing Yogasanas alone and combined practice of Dands Baithaks and Yogasanas, on shoulder muscular strength and endurance, abdominal muscular strength and endurance, flexibility, aerobic capacity, anaerobic power, breath holding time and resting respiratory rate.

4. The result of the experimental study will be useful for coaches to implement in their training methods to improve the performance.

5. The finding of the study will add the quantum of knowledge in the area of training method and exercise physiology.