REVIEW OF LITERATURE

At present fitness is a National and International approach of the modern world, therefore man is too much attached with the physical fitness programme. It is an integral part of life, moreover it can ensure good health, disease control and psycho-physiological balance in modern civilization. A scientific approach to yoga fitness and its building up to healthy society and healthy nation is antidote to all psycho-physiological hazards. The modern mankind is loud of its civilization. Every day new tools and equipments are being invented. But the proud man has failed to combat with the sadly diseases like cancer, plague, AIDS and many other new unknown diseases like a prey and taking a heavy toll of life.

In the ancient advanced cultures like Greek, Spartan, Athens and Indus-Valley civilization there is a clear proof of regular physical exercises, all this is known to each and everybody. Now amongst the physical exercises most effective ones are yoga and naturopathy. It is now being realised in all parts of globe that yoga is not only for better development of mind but is also a method for physical and physiological development. That's why the study relating to the effects of yogic asanas and pranayamas on physical and physiological components is receiving greater attention of the people today. In the recent past many attempts have been made by the scholars to explain the effects of yogic exercises on physical and physiological fitness.

Larson and Yocom (1951) surveyed physiological research and tested 10 components of physical fitness like: (i) Resistance to disease; (ii) Muscular strength; (iii) Cardiovascular respiratory endurance; (iv) Muscular power; (v) Flexibility; (vi) Speed; (vii) Agility; (viii) Co-ordination; (ix) Balance and (x) Accuracy.

Fleishman has done considerable research in the area of physical fitness and he recommended nine physical fitness components, such as, extent flexibility, dynamic flexibility, plosive strength, static strength, dynamic strength, trunk strength, gross body Co-ordination, gross body equilibrium and cardiovascular endurance.
Fleishman further grouped these factors in a number of areas after the factor analysis. The most important among these areas are strength, flexibility and endurance, which have been investigated for further research purposes by a number of researchers (Hettinger and Muller (1953), Mathews and Krauze (1957), Venderhoof (1961), Berger (1962), Burnham (1966), Shvartz (1966), eBhoie (1972), Ganguli (1974) and Gharote (1976).

Vinekar (1957) has made a study "Asanas in every day life". Asana could be done as exercise and as posture. Through the practice of both types of asanas, one can achieve organic and functional promotion of health and fitness. As postures they worked on postural substrate and muscle tone and thus helped to develop body awareness through proprioception and vestibular senses. Sensation of pleasant pain felt by the individual.

Herbert de Vries (1961) evaluated the static stretching procedures of Hathayoga (technically called Asanas) for improvement of flexibility. Comparing the effects of static stretching with that of conventional ballistic methods of stretching for seven periods of 30 minutes each, he found that both the methods improved flexibility.

Partap (1968) made a study "Steadiness in normal before and after yogic practices" significant increase in hand steadiness was observed in 26 Males and 8 Females at the end of one month training in Yoga. "Relax subject" showed better steadiness as compared with "tense subjects".

Karambelkar (1969) et al made a study “Muscles activity in some asanas”. They found that electrical activity in muscles was reduced during practice of selected asanas.

Therrien (1969) and Dhanaraj (1974) also confirmed the results about the improvement in flexibility through yogic exercises.

Certain investigators (Datay et al., 1969) observed that changes brought about by this asana were dropped in blood pressure, metabolic rate, slowing down of respiration and the heart rate as well as increase in the skin temperature.
Rangan (1969), conducted an experimental study to investigate the effect of Sarvangasana and Halasana on the basal metabolic rate of athletes. The subjects were 23 students of the first year B.P.E. of Lakshmibai College of Physical Education, Gwalior. Basal metabolic rates of the subjects were calculated from oxygen consumption. Record obtained with the help of McKesson Metabolor Laboratory of the G.R. Medical College, Gwalior where the McKesson Metabolor apparatus was available. Subjects were transported, in a recumbent position, in the college bus of Lakshmibai College of Physical Education, Gwalior. Care was taken to ensure the basal condition in the subjects before taking a reading of their oxygen consumption.

After determining the initial basal metabolic rates of subjects, they were divided into two groups, equated on the basis of mean and standard deviation. The control group (Group A) consisted of eleven subjects and the experimental group (Group B) consisted of twelve subjects. The groups resided in the college hostels and took meals in the same mess and participated in the general programme of activities of the college. The experimental group only was subjected to the experimental treatment of performance of Sarvangasana and Halasana for a period of six weeks during August and September, 1968. At the end of experimental treatment, the basal metabolic rates of all the subjects belonging to control group as well as experimental group were determined. The mean gains of both the Control and Experimental groups were tested for significance by the T test. The mean gain of experimental group was found to be statistically significant while the mean gain of control group was not statistically significant. The level of confidence at which the null hypothesis was rejected, was 5 per cent.

It was concluded that (i) the activity of thyroid gland could be influenced by the performance of Sarvangasana and Halasana, (ii) the basal metabolic rate increases significantly by the performance of the above said two asanas, and (iii) general physical activities had no appreciable effect on the basal metabolic rate.
Romanowski (1971) and Pasek (1971) have done considerable scientific research on psycho-physiological aspects of yoga. The studies showed that yoga exercises influence the parasympathetic system and helped mental calmness and normal emotional sensitivity. Certain exercises in yoga facilitate psychic concentration and relaxation through conscious control of the vegetative system.

According to Ryan (1971) Yogic exercises have proved to be helpful for flexibility and relieving tension.

Kocher and Pratap (1972) conducted a study to explore the possibilities of favourable influences of yogic practices on psychomotor Co-ordination. All the subjects were tested for physical fitness individually before the training or yogic practices, and than after three weeks yogic training programme the same Subjects were again tested in the same controlled conditions. Yogic practices are claimed to have reduced the psycho-physiological disequilibrium and stabilize the mechanism in the face of external and internal stimuli. The results obtained in this study seemed to be in favour of the claims made for the effects of yogic practices.

Bhole and Karambelkar (1972) studied the effect at yoga training on vital capacity and breathe holding time. Vital capacity milliliter and breath holding time in seconds were measured respectively in 147 and 139 males between the age group 18 to 50. Before and after three week training in 20 asanas, two breathing practices and three kriyaa at time yoga sharps were held. At Over age increase of 157 milliliter in vital capacity and an average crease of 15 seconds in the breath holding were observed after training period.

Bhole and Karmbelkar (1972) have summarised the benefits of Yoga, based on research studies conducted at the Yoga Institute, Lonavala, Poona. Positive pressure changes take place in the visceral organs. Yoga influences circulation, nutrition, exertion, secretion and function of the respective organs. While explaining the results he pointed out that the vertebral column gets all possible movements, which help to tone
up the spinal muscles, nerves and nerve roots. Different groups of muscles get stretched in different asanas. This stimulates the muscle spindles, and the impulses from the subcortical regions bring a change in the muscle tone. This helps to remove the imbalance in the muscle tone. With this, hyper and hypotonic conditions could be tackled. Further, the pranayamic breathing effects the nervous system more than the respiratory system. Due to the inflation and deflation of the lungs, the receptors are stimulated and impulses are sent to the brain which helps to alter the tonicity of the autonomic nervous system. It leads p tranquilization.

Gharote (1973) conducted a study on 'Effect of Yogic Training on Physical Fitness'. The purpose of this study was to collect Objective evidence about the effectiveness of the short term practice of the selected yogic exercises in their contribution to physical fitness measured through the Fleishman Battery of Basic Fitness Tests. As many as 17 male and 12 female students of summer camp certificate course in the year 1973 were tested. Result showed that the mean increase of 7.74 in fitness index of the males and 11.75 in the case of females was found statistically significant.

Cocher (1973-74) made a study "Effect of Savasana on the extent on knee-jerk". He fined it out that reflex activity in patellar tendon decreased after performing Savasana for two minutes.

Ganguly and Gharate (1974) conducted a study to know the fleets of yogic training on cardio-vascular efficiency before and after yogic training. In the maintenance of proper health, physical fitness and motor fitness, cardio vascular fitness plays a vital role. So this study was conducted with the purpose to determine the effect of long term yogic training programme on cardiovascular opacity. Harvard Step Test was used to measure the earlier vascular fitness. The test was administered to eleven male students of G.G.S. College of Yoga and Cultural Synthesis, Kaivalyananda, Lonavila, before the yogic training started in order to determine their level of cardio vascular efficiency. The subjects were given yogic training daily except on Sundays and few holidays for sixty
minutes in the morning for a period of 8 months. On the completion of training, the subjects were again administered the Harvard Step Test and comparisons were made between the pre-training data and post training data. The result of this study indicated that a daily one hour programme of yogic practices significantly improved cardiovascular efficiency of the subjects.

Motor fitness and physical fitness are supposed to depend upon the cardiovascular efficiency of an individual to maintain strenuous activity of the whole body for prolonged period. And the man, who has good cardiovascular efficiency, has good endurance to do any type of activities including sports activities.

Heyes (1974) conducted a study on 'Blindness and Yoga'. The main purpose of the study was to see whether yoga helped to any extent in blindness. He found that physical fitness of the blind by taking yoga asanas might be achieved painlessly and the blind might reduce anxiety.

Kocher (1974) made a study "some appraisal of steadiness and two hand coordination as a result of yogic practices". Significant improvement in two hand coordination and increase in and steadiness were observed in 13 subjects at the end of nine on month training in yoga and 24 subjects at the end of one month training in yogic physical culture.

Ganguly and Gharote (1974) observed in another study; that a long term yogic training influences the cardio-vascular efficiency favourably. These results were obtained on the male 'students, who underwent yogic training for nine months, during which period, they did not engage in any other vigorous physical activity except yogic routine.

Bucher (1975) has given his opinion in this direction that fitness is the ability of a person to live a full and balanced existence. For such existence, health is of supreme importance. Most of the authorities on fitness agree that physical fitness is not
equivalent to health. However, some relationship does exist between health and physical fitness.

Patel (1975) studied Yoga and biofeedback in the management of hypertension. The therapy was effective reducing resting blood pressure on a long term basis. Stress tests (exercise and cold pressure tests) showed a statistical significant reduction in all parameters in the tested group except a symbolic rise after exercise which may be explained as a rise in cardiac output in portion to the metabolic demand during exercise. It was concluded that an important relationship between environmental stress and blood pressure elevation existed.

Gharote (1976) conducted a study on 40 residential students of a high school. They were randomly selected and divided into experimental and control groups, and were matched on the basis of the physical fitness index derived from Fleishman battery of basic fitness tests. The experimental group was given training in selected yogic exercises for a period of three weeks. The training session was of 30 minutes' duration. After the experimental period both the groups were again tested on the same Fleishman battery of basic fitness tests. Fitness indices along with the scores on individual test items of both the groups were compared statistically. The results revealed that the experimental group showed significant improvement in physical fitness. Among the individual test items significant achievement in scores was observed in leg lift, shuttle and balance.

Mall, Chaudhry and Giri (1978) conducted a study entitled, “Effect of yogic Relaxo-Concentration Training on Two Psychomotor Tasks After Submaximal Exercises” to evaluate the effects of Yogic relaxo-concentration training on two psychomotor tasks after submaximal exercises. The results of the study revealed that yogic relaxo-concentration training could be used as an effective method to hasten the psychic and physical restoration progresses after submaximal exercise.
Udupa compiled a scientific treatise on "Disorders of stress and their Management By Yoga" in 1978. The following psychological and physiological conclusion were drawn from various studies:

1. Yogic asanas and pranayama improved memory and intelligent quotient. The practice brought about homeostasis in psychophysiological functions.

2. Pulse rate and blood pressure decreased. Biochemically, there was reduction in the circulating acetylcholine, serum cholesterol and blood sugar levels. There was an increase by serum proteins and an improved thyroid functions.

3. Savasana and meditative poses improved relaxation, reduced blood pressure and enhanced the microcirculation to the vital organs of the body. Plasma catecholemin was reduced indicating reduction of the activity of the Sympathetic Nervous System.

The studies discussed above show that yogic exercises are helpful in improving physical fitness. But these studies investigate the effect of yogic asanas on only a few physical fitness components. Therefore, further studies are required to investigate the effect of yogic asanas on physical fitness index in order to arrive at generalisation.

Gharote (1978) defined yoga as practice consisting of asanas, pranayamas, bandhas and mudras, and kriyas. Asanas are special pattern of postures, involving static stretching, leading to stability of body and mind; pranayamas control the automatic process of respiration, bandhas and mudras control the semi-voluntary muscles of the body, kriyas are cleaning processes controlling the reflex mechanisms.

Recent yogic studies by Kocher (1978 and 1979) on mental fatigue, immediate memory and Knee-Jerk, have pointed out that practice of yogic asanas significantly improved performance of mental work and memory. The reflex activity in patellar tendon or nee-jerk extent was reduced-indicating a sign of general relaxation.
A study was undertaken by Gharote (1979) to assess the status of physical fitness of the school boys and to analyze the effect of the short term yogic training programme of three weeks on their physical fitness. Yogic exercises were progressively introduced to the experimental group in the first week and the remaining two weeks were devoted to the practice. After the experimental period was over, both the groups were tested with the same battery of tests again. In order to determine the detraining effect of the yogic exercises, the practice of the experimental group was discontinued for a period of three weeks. The experimental group was again tested with the same battery of tests in the same manner as before. Results of the study showed a mean difference of 2.83 between the post-training and post-training. Scores of the physical fitness Index indicated significant reduction in the scores suggesting that the training effect was not sustained after discontinuing the practice of yogic exercises for three weeks. However, the training effect was not completely lost.

Kocher (1979) followed a before and after design has claimed that Hath-Yogic practices are found to be helpful in reducing the high activation level and psycho-physiological disequilibrium. This study was conducted on a group of 19 subjects, ranging from 17 to 55 years in age, who participated in a Summer Camp Certificate Course Yoga.