CHAPTER II
REVIEW OF RELATED LITERATURE

The Researcher has made sincere Efforts to collect the literature Related to this study and found some References to similar studies which have been reviewed are produced in this chapter.

Review of Related literature is very important and it plays a vital role to understand the problem thoroughly. In the present chapter the investigator is made an attempt to report the literature based upon the effects of different yogic exercises.

The Related literature Reviewed for better understanding of the problem and to interpret the results systematically, they are presented in this chapter. The reviews were collected from various sources like books, journal, and periodicals and provide back ground information to the study and help us to understand various concepts of yogic exercises on Health Related Fitness, Cardiovascular Endurance, Muscular Endurance, Muscular Strength, Flexibility and Body composition.

Tran, Holly, et. al., (2001), had conducted a study on the Effect of hatha yoga practice elicited improvement on the Health – Related aspects of physical Fitness. Ten healthy, untrained volunteers (nine female and one male), ranging in age from 18-27 years, were tested on muscular strength and endurance, flexibility, cardio respiratory fitness, body composition and pulmonary functions. Training was given two days in a week for a period of eight weeks. It was found out that regular hatha yoga can elicit improvement in the health – related aspects of physical fitness.

Reddy and Ravikumar (2001) conducted a study on yogasana and aerobic dance and their effects on selected Health fitness components in girl subjects. The speed, shuttle run, agility, sit and reach to test flexibility and 9 min run/walk to test cardio respiratory endurance were conducted for control, yogasana and aerobic dance groups. The training was given for a period of 12 weeks with 10 subjects in each group. The data were analyzed by ‘t’ test, analysis of co-variance and post hoc testn was done with Scheffe’s test. It was concluded that the practice of Yogasana improved significantly the speed, agility, flexibility and cardio-respiratory endurance, while practice of aerobic dance also improved significantly the above factors and
there was no difference in between yogasanas and aerobic dance groups after training with regard to the speed, agility, flexibility and cardio-respiratory endurance.

**Tiken, Kosana, Joy and Inaobi (2002)** have conducted a study on influence of specific yoga and aerobic exercise on physical fitness of SAI (NERC IMPHAL) STC Athletes. 30 boys and 30 girls from SAI NERC Imphal were divided into two groups according to their mean age and height of 17.5 years and 15 years and 172.8 cms and 156.4 cms respectively. Training was given twice in a week for four months. Vertical jump to test explosive power, push ups and sit ups to test strength endurance, sit and reach to test flexibility, 50 yards dash to test speed and 12 min run walk to test endurance were conducted for aerobic exercise and yoga group before the training and after the two months and four months of training. It was concluded that (i) Improvement of physical fitness assessed on three selected physical fitness tests after four months of yoga and aerobic had justified the fact that both yoga and aerobic exercise were effective in developing physical fitness and (ii) in yoga and aerobic exercise groups, boys were found superior to girls group in sit and reach (flexibility) and 12 min run – walk (endurance), 50 yards (speed).

**Asai and Rane (2011)** conducted an experiment study on asanas and lezium programme on selected physical fitness variables of school boys. The objectives to measure over all physical fitness level of the school boy of age 14 to 16 years. Selected subjects were divided into two equal groups one control group and a experimental group. Seventy male students (n=70) from the secondary section of our lady of Nazareth high school, Bhayandar, Mumbai in India. The health related physical fitness test was considered as dependent variable. The subjects of the experimental group were then put under six weeks of lezium and yogic exercises training programme. The collected data were statistically analyzed by using analysis of variance (ANOVA). The authors conclude that there was significantly changes in health related physical fitness such as, cardio-respiratory endurance, abdominal strength and endurance and flexibility increase the performance. However, the body fat percentage significantly reduces performance for due the asana and lezium training programme.
Mark D. Tran, et al., (2007) Ten healthy, untrained volunteers (nine females and one male), ranging in age from 18–27 years, were studied to determine the effects of hatha yoga practice on the health-related aspects of physical fitness, including muscular strength and endurance, flexibility, cardio respiratory fitness, body composition, and pulmonary function. Subjects were required to attend a minimum of two yoga classes per week for a total of 8 weeks. Each yoga session consisted of 10 minutes of pranayamas (breath-control exercises), 15 minutes of dynamic warm-up exercises, 50 minutes of asanas (yoga postures), and 10 minutes of supine relaxation in savasana (corpse pose). The subjects were evaluated before and after the 8-week training program. Isokinetic muscular strength for elbow extension, elbow flexion, and knee extension increased by 31%, 19%, and 28% (p<0.05), respectively, whereas isometric muscular endurance for knee flexion increased 57% (p<0.01). Ankle flexibility, shoulder elevation, trunk extension, and trunk flexion increased by 13% (p<0.01), 155% (p<0.001), 188% (p<0.001), and 14% (p<0.05), respectively. Absolute and relative maximal oxygen uptake increased by 7% and 6%, respectively (p<0.01). These findings indicate that regular hatha yoga practice can elicit improvements in the health-related aspects of physical fitness.

Bower, et al., (2005), Strength and Flexibility in a Recent study on the fitness -related effects of hatha yoga, 10 yoga naïve and previously untrained subjects aged 18 to 27 years participated in 85 min of pranayama and hatha yoga practices twice a week for 8 weeks. These subjects should showed significant improvement in upper and lower body muscular strength, endurance, and flexibility. No statistically significant change in body composition or pulmonary function was observed.

Murugesan et.al., (2007) studied the Effect of selected yogasanas on muscular strength and flexibility among higher secondary school boys. Subjects were forty higher secondary school boys from K.V.R.Higher Secondary School, Virudhunagar. They were divided into groups as experimental group and control group to test the muscular strength and hip flexibility. Pull-ups and sit reach tests were administered at the beginning and end of six weeks experimental treatment respectively. The collected data were statistically analysed by using ‘T’ tests for correlated means. It was found
that there was significant difference in muscular strength and flexibility between experimental group and control group.

**Jeyaveerapandian, (2000)** conducted a study on the outcome between Physical Exercises and Yogic exercises on selected physical and physiological variables during off-season among the sports participants. 90 subjects were selected randomly from various games and they were equally divided into three groups. After the experimental period (six weeks) the yogic exercises group showed significant improvement in abdominal muscular endurance, flexibility, heart rate and systolic blood pressure.

**Milind v. Bhutkar and Pratima m. Bhutkar (2011), done** a Research on “How Effective Is Sun Salutation in Improving Muscle Strength, General Body Endurance and Body Composition” Methods: 6 days a week for 24 weeks. Upper body muscle strength was determined by 1 repetition maximum (1RM) for bench press and shoulder press technique. Back and leg dynamometry was used to assess strength of back and leg muscles. General body endurance was evaluated by push-up and sit-up tests. Results: Muscle strength by bench press showed significant increase in male and female subjects. Strength by shoulder press also increased males and females. Endurance by push-ups & half sit-ups showed similar findings in male and female subjects. A significant decrease in body fat percent was observed only in female but not in male subjects. BMI significantly decreased in both the groups.

**Madanmohan et al. (2004)** conducted a study on modulation of cardiovascular response to exercise by yoga training. This study reports the effects of yoga training on cardiovascular response to exercise and the time course of recovery after the exercise. Cardiovascular response to exercise was determined by the Harvard step test using a platform of 45 cm height. The subjects were asked to step up and down the platform at a rate of 30/min for a total duration of 5 min or until fatigue, whichever was earlier. Heart rate (HR) and blood pressure response to exercise were measured in the supine position before exercise and at 1, 2, 3, 4, 5, 7 and 10 minutes after the exercise. Exercise produced a significant increase in HR, systolic pressure and a significant decrease in diastolic pressure. After two months of yoga training, exercise-induced changes in these parameters were significantly reduced.
Barshankar et al., (2003) examined the effect of yoga on cardiovascular function in subjects above 40 years of age. Pulse rate, systolic and diastolic blood pressure and Valsalva ratio were studied in 50 control subjects (not doing any type of physical exercise) and 50 study projects who had been practising yoga for 5 years. From the study it was observed that significant reduction in the pulse rate occurs in subjects practicing yoga (P<0.001). The difference in the mean values of systolic and diastolic blood pressure between study group and control group was also statistically significant (P<0.01 and P<0.001 respectively). The systolic and diastolic blood pressure showed significant positive correlation with age in the study group (r1 systolic=0.631 and r1 diastolic =0.610) as well as in the control group (r2 systolic =0.981 abd r2 diastolic =0.864). The significance of difference between correlation coefficient of both the groups was also tested with the use of Z transformation and the difference was Significant (Z systolic =4.041 and Z diastolic =2.901). Valsalva ratio was found to be significantly higher in yoga practitioners than in controls (P<0.001). Our results indicate that yoga reduced the age related deterioration in cardiovascular functions.

Pratima M. et al. (2008), done a research on “Effect of Suryanamaskar Practice on Cardio-respiratory Fitness Parameters: A Pilot Study”. The study contains the following. In recent times, medical fraternity is attracted towards yoga. Suryanamaskar is a part of yogic practices and is believed to be an all-round exercise. The present study tested efficacy of regular practice of ‘suryanamaskar’ in improving the cardio-respiratory fitness. The present study was conducted on 78 subjects, (48 males and 30 females). It was observed that 6 months of suryanamaskar practice decreases resting pulse rate and blood pressure. At the same time it increases cardio-respiratory efficiency and respiratorycapacity as evaluated by bicycle ergometer and various lung functions tests, in both male and female subjects. From this study we conclude that suryanamaskar practice can be advocated to improve cardio-respiratory efficiency for patients as well as healthy individuals.

Maity and Samanta (2001) conducted a study on the Effect of calisthenics and yogasanas on Health fitness status of fifth grade girls. Pre test and post test scores of Oregon Health Fitness test obtained from the calisthenics group, yogasana group and control group were analyzed by using ‘t’ test after 12 weeks training. It was concluded that (i) improvement of Health fitness as assessed on Oregon Health
Fitness Test after 12 weeks of treatment justified the fact that both the programmers of calisthenics and yogasana were effective in developing Health fitness of fifth grade girls. (ii) Calisthenics exercise programme was found superior to yogasana in improving performance in each individual test item of Oregon Health Fitness test except crossed arm – curl ups. Gharote (1979) administered sit-ups test to note the strength and endurance of the abdominal muscles. 20 female subjects were given yogic exercise for duration of three weeks. He noticed significant muscles of 12 subjects.

Physical activity from 24-hour activity records for three days, two week days and one weekend day. Health related fitness was assessed as the one mile run (cardio respiratory endurance), timed sit-ups (abdominal strength and endurance) sit and reach (lower back flexibility), and subcutaneous fatness (sum of the triceps, sub scapular suprailiac, and medical calf skin folds). Physical activity is significantly and positively correlated with one mile run performance and sit-and-reach but not with sit ups and subcutaneous fatness. Over all, the strength of the relationship between estimated energy expenditure and specific fitness items in the total sample vary from low to moderate, with only 1% to 12% of the variance in fitness variables being explained by estimated energy expenditure comparisons of active versus inactive and fit versus unfit adolescents provide additional insights. The more active ( highest quartile ) are also more fit in cardio respiratory endurance and in the sit and reach than 50 the less active (lowest quartile) , and the more fit in the one mile run(better tune lowest quartile) and the sit and reach ( highest quartile ) are more active than the less fit in the each item respectively.

Telles et al. (2004) conducted a study on an evaluation of the ability to voluntarily reduce the heart rate after a month of yoga practice. This study determined whether yoga reduced heart rate and whether the reduction would be more after 30 days of yoga training. Two groups (yoga and control, n = 12 each) were assessed on Day 1 and on Day 30. During the intervening 30 days, the yoga group received training in yoga techniques while the control group carried on with their routine. At each assessment the baseline heart rate was recorded for one minute. This was followed by a six-minute period during which participants were asked to attempt to voluntarily reduce their heart rate, using any strategy. Both the baseline heart rate and the lowest heart rate achieved voluntarily during the six-minute period were significantly lower.
in the yoga group on Day 30 compared to Day 1 by a group average of 10.7 beats per minute (i.e., bpm) and 6.8 bpm, respectively. In contrast, there was no significant change in either the baseline heart rate or the lowest heart rate achieved voluntarily in the control group on Day 30 compared to Day 1.

**Devaraj (2000)** conducted a study on the Effect of yogic practice on Health Related physical fitness of visually impaired boys of the age group of 13 to 15 years. He selected 40 persons among which 20 were in the control group. He treated yogic practice on the experimental group. He treated yogic practice on the experimental group for six weeks to find out cardio-vascular endurance, flexibility, biceps and sub-exposal enhancement and made note at pre and post tests. The post test scores proved that there was significant improvement and enhancement among the boys due to the yogic practice. The recovery from induced physiological stress in Shavasana (a yogic relaxation posture) and two other postures (resting in chair and resting supine posture) was compared. The results revealed that the effects of stress were reversed in significantly shorter time in Shavasan, compared to the resting posture in chair and in a supine posture (Bera et al. 1998).

**Datar and Kulkarni (1997)** conducted a study on yogic practices and cardio vascular efficiency. The subjects were 48 males and 52 females of age group 16-24 years. Yoga training was given for a period of 21 days (3 weeks). Cardiac efficiency was measured using Harward step test, before and at the end of training period. There is a significant improvement in the cardio vascular efficiency measured in terms of fitness index both in males and females.

**Sakthi Gnanavel and Buvaneswari (2006)** investigated the Effects of selected psycho- physiological variables of working women. Fifteen normal female volunteers had undergone eight week training programme on Asanas, Pranayama and Meditation. The suitable psychological parameters (personal stress and health systems) and physiological parameters (pulse rate and heart rate) were taken before and after the yoga practice programme. The results showed that there is greater improvement in all aspects of experimental group than the control group.
Madanmohan, Udupa, Bhavanani, Shatapathy, and Sahai (2004) had 21 male participants (age: 17 – 19 years) engage in 45 minutes of yoga daily for two months. After the two month period the participants displayed a decrease in exercise induced measures of HR, systolic BP, and work done by the heart, as determined by the Harvard step test, indicating a milder cardiovascular response to exercise and a greater exercise tolerance, as a result of yoga training. Similar improvements in cardiovascular endurance, as determined by the Harvard step test, were also found in 40 male participants, age 12 – 15 years who engaged in 45 minutes of yoga, three days per week, for a period of one year (Bera & Rajapurkar, 1993). Aslan and Livanelioglu (2002) studied ten female and eight male participants, with a mean age of 20 years, whom engaged in a 60 minute iyengar yoga routine, four days per week, for a period of six weeks. After the training the yoga participants showed a 9.8% increase in aerobic power, as determined by the Cooper 12 minute run test.

Sasi Kumar and Sivapriya D. (2011), done a research on “Effects of suryanamaskar on cardiovascular Endurance parameters in school student” The ultimate goal is to improve the physical health and increase the quantity of sportsmen with effective cardiorespiratory efficiency. Methods: This study was designed to evaluate the effects of a 45 days study period. The practice of suryanamaskar on blood pressure(BP), heart rate(HR), respiratory rate (RR), in school students of both sexes.115 school students aged 10 to 14 years were recruited for the study. The cardiovascular and respiratory parameters BP, HR, RR, were measured before and after practice of suryanamaskar. Results: The results showed that the Systolic blood pressure, increased significantly and RR, HR and diastolic blood pressure decreased significantly after the practice of suryanamaskar.

Selvakumar, chandarasekar and pushparaj (2011) conducted the effect of selected yogic practices on cardiovascular endurance of college students. Sixty male subjects were selected from Thiagarajar College, Madurai and their age ranged from 18 to 20 years. The subjects were divided into two groups namely the control and the experimental group. The experimental group underwent selected asanas and pranayama practice weekly five classes for twelve weeks. Control group did not undergo any training programme rather than their routine work. Cardiovascular
endurance was measured through field test using by one mile run and walk. Prior to and after end of practice period all subjects were tested. The results of pre-test and post-test were compared with using Analysis of Co-variance. Finding of Cardio vascular endurance shows significant improvement due to the practices of yoga when compared to the control group.

Saminathan (2010) conducted a study to evaluate the influence of selected yogic asana training of flexibility among sports persons. 40 sportsmen were given yoga training for 8 weeks. After 8 weeks of training he found that yoga training significantly improved flexibility among sports persons.

Govindarajulu et al. (2003) studied the effect of yoga practices on flexibility and cardio respiratory endurance on high school girls. Sixty (n = 60) high school girls (average age 12 years) volunteered for a pre-experimental group design, where the practice of selected yoga practice was given as an intervention to the experimental group ‘A’ (n1 = 30) for a period of eight weeks. The control group ‘B’ (n1 = 30) was not allowed to participate in the experimental treatment. The pre-and post-tests were conducted on flexibility and cardio-respiratory endurance. The results of ANOVA revealed that there was an improvement in the flexibility and no significant change was evident in the cardio-respiratory endurance. Thus, short-term yoga is useful in improving flexibility, but not the cardio respiratory endurance vent at the stage of puberty in girls.

Vishaw Gaurav (2011) The aim of the study is to determine the effects of hatha yoga training on health related physical fitness variables including muscular Strength, Agility, Power, Speed and Cardiovascular Endurance. Thirty randomly selected male students of department of physical education (T) Guru Nanak Dev University, Amritsar (Punjab, India) aged 18 –24 years, volunteered to participate in the study. Subjects were assigned into two groups: A (experimental: N-15) and B (control: N-15). The subjects from Group A were subjected to an 8-week hatha yoga training programme. Each yoga session consisted of 10 minutes of pranayamas , 15 minutes of dynamic warm-up exercises, 40 minutes of asanas and 5 minutes of supine relaxation in savasana. The subjects were evaluated pre and post the 8-week training program.Student’s t-test was used to assess the between-group differences for dependent data to assess the Post-Pre differences. Results indicated that the health
related physical fitness variables including muscular Strength, Agility, Power (p<0.01) and Speed (p<0.05) significantly improved in group A compared with the control one. There was non-significant improvement found in experimental group for cardiovascular endurance. These findings indicate that regular hatha yoga practice can elicit improvements in the health-related aspects of physical fitness and may contribute to enhance health status and wellness.

**Fillmore et al. (2010)** documented the effects of yoga interventions on balance, flexibility, and strength in adolescent girls 14 to 18 years. Quasi-experimental, non-randomized. A convenience sample of 33 female adolescents participated in yoga training 2 times per week and a walking program 3 times per week, for 7 weeks. The instructor-led group received instruction from a registered yoga therapist in person, while the video-led group watched a tape of the instructor-led session. Pre- and post-measurements of weight, hamstring flexibility, body fat, strength, and balance were collected. Means were computed for all variables. Levene's tests for equality of variances were run to determine baseline homogeneity. Histograms with a normal curve superimposed were drawn to check for normal distribution. Repeated-measures general linear model tests were run to test for both within- and between-subjects factors, as well as interactions between the two. Yoga may be a useful adjunct to therapy programs and provide a method to keep this age group interested in exercise.

**Ramesh, et.al., (2007)** investigated the effect of selected yogasanas and pranayama on selected physical and physiological variable of school boys. Agility, flexibility, systolic blood pressure, diastolic blood pressure and pulse rate were selected as variables of the study. 30 school boys were selected randomly as subjects. Their ages ranged from 12-15 years. They were divided into two equal groups and assigned an experimental and control groups. The changes in the selected parameters were attributed to the regular practice of yogasana and and pranayama training. The results indicated significant increases in efficiency of selected variables during eight weeks of training.

**Rajakumar J (2010),** done a research on “The Impact of Yogic Practices and Physical Exercises on Selected Physical Variables among Inter-Collegiate Soccer Players”. The study contains the following. The purpose of the study is to analyze the impact of yogic practices and physical exercises on selected physical variables among
intercollegiate soccer players. To achieve this purpose, sixty (60) male intercollegiate soccer players from Chennai were selected at random. The selected subjects were divided into three equal groups of 20 each, namely yogic practice group (Group A), physical exercises group (Group B) and control group (Group C). The experimental groups have undergone 12 weeks of training. The control group (Group C) maintained their daily routine activities and no special training was given. The subjects of all the three groups were tested using standardized tests and procedures on the selected physical variables before and after the training period to find out the training effects using the following test items: 50 meters. Run to measure speed, shuttle run to measure agility, sit and reach to measure flexibility. The yogic practice group showed significant improvement on flexibility. The physical exercises group showed significant improvement on speed, agility, then the other two groups after 12 weeks of training. Key words: Physical variables, Experimental groups, Control group, Speed, Agility, Flexibility, 50 meters Run, Shuttle run, Sit and reach test.

Ramesh and Subramaniam (2010) carried out a study on the effect of yogic pranayama and meditation on selected physical and physiological variables in adolescents with age group of 12 to 15 years were selected from Jawaharlal Navodaya Vidyalaya higher Secondary School Pondicherry. The subjects were divided into two groups namely control group and experimental group. The experimental group was given yogic pranayama and meditation for a period of twelve weeks, both morning and evening an alternative days in a week. The control group did not participate in yogic pranayama and meditation training programme. The collected data were statistically analyzed by using ANCOVA. The author concluded that there was a significant change in flexibility increase performance in adolescents.

Tran et al. (2001) used flexibility assessments beyond that of the sit and reach test. They assessed flexibility in four areas: ankle flexibility, shoulder elevation, trunk extension, and trunk flexion. They found significant increases in all measurements after eight weeks of yoga training. The most impressive increases were seen in shoulder elevation and trunk extension, increasing 155% and 188% respectively. The flexibility increases shown by Tran et al. further support previous documentation of increased trunk flexibility, and validate assumed flexibility increases throughout the entire body, as a result of yoga practice.
Manimakalai and Chitra (2011) studied the effect of yogasanas practice on flexibility among university women. Thirty healthy, untrained female subjects were selected from Annamalai University in various departments and their age ranged from 18 to 25 years. The subjects were divided into two groups namely the control and the experimental group. The experimental group underwent selected asanas for five days per week for eight weeks. Control group did not undergo any training programme rather than their routine work. Flexibility was measured by using sit and reach box. Prior to and after end of practice period all subjects were tested. The results of pre-test and post-test were compared with using Analysis of Co-variance. Finding of flexibility shows significant improvement due to the eight weeks yogic practice when compared to the control group.

Chidambara Raja (2010) studied the effect of yogic practice and physical fitness on flexibility, anxiety and blood pressure. Forty five subjects working women in various faculties of Annamalai University in the age group of 35 to 40 years were selected. They were divided into three equal groups each group consisted of fifteen subjects. Group I underwent yoga practice, group II underwent physical exercise and group III acted as control group who did not participate in any special training. The training period for this study was five days in a week for eight weeks. Flexibility was measured using by sit and reach test, anxiety was measured by Taylor’s Manifest Anxiety scale and blood pressure was measured using sphygmanometer. Prior to and after the training period the subjects were tested flexibility, anxiety and blood pressure (systolic and diastolic). The data were computed statistically by using “Analysis of Co-Variance” (ANCOVA). All the variables were significantly improved among experimental group than the control group.

Alagesan et al., (2010) conducted study on effect of yogasana on selected physical fitness parameters such as strength endurance and flexibility. To achieve this purpose of the study thirty men students studying in the Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu were randomly selected as subjects. They were divided into two equal groups. Each group consisted of the fifteen subjects. Group-I underwent yogasana for three days per week for twelve weeks. Group-II acted as control that did not undergo any special training programme
apart from their regular physical education programme. The following variables namely strength endurance and flexibility were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables at prior to and immediately after the training programme. The analysis of covariance was used to analyze the significant difference, if any among the groups. The 0.05 level of confidence was fixed at as the level of significance to test the ‘F’ ratio obtained by the analysis of covariance, which was considered as an appropriate. The results of the study showed that there was a significant difference Yogasana group and control group on selected criterion variables such as strength endurance and flexibility. Also it was found that there was a significant improvement on selected criterion variables due to yogasana.

**Madanmohan et. al., (1993)** had conducted a study on the effect of yoga training on reaction time, respiratory endurance and muscular strength. Twenty seven subjects were given yoga training for 12 weeks to test the visual and auditory reaction time, maximum expiratory pressure, maximum inspiratory pressure, 40 mm kg test, breath holding time after expiration, breath holding time after inspiration, and hand grip strength. It was concluded that yoga practice for 12 weeks results in significant reduction in visual and auditory reaction times and significant increase in respiratory pressures, breath holding time and hand grip strength.

**Madanmohan et al. (2008)** to designed to test whether yoga training of six weeks duration modulates sweating response to dynamic exercise and improves respiratory pressures, handgrip strength and handgrip endurance. Out of 46 healthy subjects (30 males and 16 females, aged 17–20 yr), 23 motivated subjects (15 male and 8 female) were given yoga training and the remaining 23 subjects served as controls. Weight loss following Harvard step test (an index of sweat loss), maximum inspiratory pressure, maximum expiratory pressure, 40 mm endurance, handgrip strength and handgrip endurance were determined before and after the six week study period. In the yoga group, weight loss in response to Harvard step test was 64±30 g after yoga training as compared to 161±133 g before the training and the difference was significant (n = 15 male subjects, $P<0.0001$). In contrast, weight loss following step test was not significantly different in the control group at the end of the study period. Yoga training produced a marked increase in respiratory pressures and endurance in 40 mm Hg test in both male and female subjects ($P<0.05$ for all comparisons). In conclusion, the present study demonstrates attenuation of the sweating response to
step test by yoga training. Further, yoga training for a short period of six weeks can produce significant improvements in respiratory muscle strength and endurance.

Gharote (1992) studied the effect of Yogic exercises on the strength and endurance of the abdominal muscles of the females after giving three weeks yogic exercises. The result was that he found significant increase in the strength and endurance of the abdominal muscle of the females.

Komathi and Kalimuthu (2011) study was framed find out the effect of yogic practices on abdominal strength among school boys. Forty subjects were selected from A.R.R Matriculation higher secondary school and their age ranged from 15 to 17 years. The subjects were divided into two groups namely the control and the experimental group. The experimental group underwent selected asanas and pranayama for five days per week for twelve weeks. Control group did not undergo any training programme rather than their routine work. The abdominal strength was measured by using sit ups. Prior to and after end of practice period all subjects were tested. The results of pre-test and post-test were compared with using Analysis of Covariance. Finding of abdominal strength shows significant improvement due to the twelve weeks yogic practice when compared to the control group.

Moliver N. et al. (2011) conducted this study with the purpose to examine the extent to which body mass index (BMI) and medication use in a sample of female yoga practitioners over 45 years varied according to the length and frequency of yoga practice. They administered online surveys to 211 female yoga practitioners aged 45 to 80 years. We used regression analyses to evaluate the relationship of extent of yoga experience to both BMI and medication use after accounting for age and lifestyle factors. We also conducted comparisons with 182 matched controls. Participants had practiced yoga for as long as 50 years and for up to 28 hours between yoga experience and both BMI and medication load. These significant relationships remained after accounting for age and lifestyle factors. When we computed yoga experience in terms of total calendar years, without accounting for hours of practice, significant relationships did not remain. However, there was no obesity in the 49 participants with more than 25 years of yoga practice. Yoga practitioners were less likely than non-practitioners to use medication for metabolic
syndrome, mood disorders, inflammation, and pain. A long-term yoga practice was associated with little or no obesity in a non-probability sample of women over 45 years. Relationships showed a dose-response effect, with increased yoga experience predicting lower BMI and reduced medication use.

Venkatareddy et al. (2003) examine the effect of yoga on weight and fat fold thickness in obese women. In this study 30 obese women of age range 19-53, categorized into two groups, as per Body Mass Index (BMI), were exposed to one-hour practice of asanas and pranayamas in the morning for a period of 90 days. A significant reduction (P<0.05) in BMI was seen in both the groups. In-group II (BMI greater than 35) the reduction was greater as compared to group II (BMI 25-35). Lean Body Mass (LBM), however, did not show significant change in both the groups.

Bera, and Rajapurkar (1993) conducted a study on body composition, cardiovascular endurance and anaerobic power of yogic practitioner. Forty male high school students, age 12-15 yrs, participated in a study on yoga in relation to body composition, cardiovascular endurance and anaerobic power. The subjects were assigned to a yoga group and control group. Body composition, cardiovascular endurance and anaerobic power were measured. The results revealed a significant improvement in ideal body weight, body density, cardiovascular endurance and anaerobic power following yoga.

Lohan and Rajesh (2002), studied the effect of asanas and pranayamas on physical and physiological components of boys between age group 12-16 years. One hundred and twenty subjects were equally divided into asana, pranayama, combined and controlled groups. Ten weeks training programme was given to test the abdominal strength, speed, agility, power and endurance by using AAPHER Youth fitness test battery and blood pressure, heart rate, vital capacity and pulse rate. Pre test and post test scores were analyzed by using ANACOVA. It was concluded that physical and physiological fitness was improved by the training of selected yogic exercise. The combined group of asanas and pranayama showed significant improvement in the physical and physiological fitness parameters. Michande (1996) study of physical fitness represented on of the several of fact of sports and physical activity, which could have, In short and long terms, definite Influences on the health and well being
of children and adolescents, as well as adults and at the same time the measurement of physical fitness raised several conceptual methodological and technical problems which explained why surveys including such measures had been scarce until recently. Hence a Literature review had been made by michand and narring in search of the methodological problems linked with fitness measurements. Describing the components of physical fitness as endurance, muscular strength, agility, co-ordination and body composition the researcher reviewing the main test batteries available recommended the utilization of the test batteries.

Padmanathan, (2011), conducted a study on the effect of low impact aerobic exercises on selected health related physical fitness variables such as muscular endurance, cardio respiratory endurance, flexibility and Bodymass index of male adolescents. Their age ranged from 12 to 15 years. They were divided in to two groups and designed as Experimental group ‘A’ and Control group ‘B’ The Experimental group-A was given aerobic and calisthenics exercises for a period of twelve weeks, both morning and evening for five days in a week, whereas control group-B is not involved any specific exercise programme other than their regular physical activities programme as per their school curriculum. The result of this study indicated that muscular endurance and cardio respiratory endurance were significantly improved and also it was observed that Body mass Index significantly reduced.

Ramesh and Subramaniam (2010), suggested that effect of physical activity and aerobic fitness on health related physical fitness variables of overweight and obese adolescents. The selected variable includes muscular endurance flexibility, cardio-respiratory endurance, and body composition (body mass index). For the purpose of the study thirty obese boys in the age groups of 12 to 15 years and they were selected at random from Tirunelveli district higher secondary schools. They were divided into two equal groups and assigned as experimental group and control group. The experimental groups were given physical activity and aerobic exercise for a period of twelve weeks, both morning and evening on five days a week. Control group did not participate in physical activity and aerobic exercise training programme. The collected data was statistically analyzed by using analysis of covariance (ANCOVA). The Experiment group had a significant Improvement on the health related physical fitness variables of overweight and obese children than the control group. The authors
conclude that the experimental group has achieved significant improvement on muscular endurance, flexibility, cardio-respiratory endurance, and body mass index in significantly on due to the physical activity and aerobic exercise training programme.

Tran ET al. (2001) tested the muscular endurance of nine females and one male before and after yoga training. Muscular endurance was tested at the knee and elbow joints by recording time until the participant could no longer maintain 70% of their maximal torque. Muscular endurance during knee flexion significantly increased by 57% after yoga training, whereas muscular endurance during knee extension, elbow extension, and elbow flexion did not significantly change.

Ramesh and Subramaniam (2011) conducted a study on the effect of aerobic and calisthenics exercise on health related physical fitness variables such as muscular strength, muscular endurance, flexibility, cardio respiratory endurance and body mass index (BMI) of obese adolescents. Their age ranged from 12 to 18 years. They were divided into two groups and designed as the experimental group and control group. The Experimental group was given aerobic and calisthenics exercise for a period of three months, both morning and evening for five days in a week. However, the control group was not allowed to participate in aerobic and calisthenics exercise training programme. The result of this study indicated that muscular strength, muscular endurance, cardio respiratory endurance were significantly improved, and also it was observed that Body mass Index significantly reduced.

Madanmohan et.al, (1997) assessed the effect of yoga training on reaction time, respiratory endurance and muscular strength. Twenty seven male medical students were randomly selected from Jawaharlal institute of postgraduate medical education and research in Pondicherry and their aged from 18 to 21 years. They were given yoga training on 12 weeks of 30 minute for six days. Muscular strength was measured using by hand grip dynamometer. The results of pre- test and post- test were compared by using t ratio test. There was significant improvement on reaction time, respiratory endurance and muscular strength among male students after the intervention.
Krishnan K (1977) studied the effect of selected yogic practices upon the development of flexibility. This study was conducted in the subjects selected from the YMCA College of Physical Education, Madras, and Tamil Nadu state. The result showed a good improvement in flexibility after training in yogic practices. In another study, investigating the effects of nine weeks yogic training programmers on physically conditioned young males.

Sinha B. et al. (2004), done a research on “Energy Cost and Cardiorespiratory Changes during the Practice of Surya Namaskar”. The study contains the following. Surya Namaskar (SN), a group of Yogic exercise consists of a set of twelve postures which is practiced by some of the yoga practitioners. The present study was undertaken to observe critically the energy cost and different cardiorespiratory changes during the practice of SN. Twenty-one male volunteers from the Indian Army practiced selected Yogic exercises for six days in a week for three months duration. The Yogic practice schedule consisted of Hatha Yogic Asanas (28 min), Pranayama (10.5 min) and Meditation (5 min). In the Yogic practice schedule 1st they practiced Kapala Bhati (breathing maneuvers) for 2 min then Yoga mudra (yogic postural exercise) for 2 min, after that they took rest until oxygen consumption and heart rate (HR) came to resting value. Subsequently subjects performed SN for 3 min 40 seconds on an average. After three months of training at the beginning of the fourth month subjects performed entire Yogic practice schedule in the laboratory as they practiced during their training session and experiments were carried out. Their pulmonary ventilation, carbon dioxide output, Oxygen consumption, HR and other cardiorespiratory parameters were measured during the actual practice of SN. Oxygen consumption was highest in the eighth posture (1.22+/- 0.073 1 min (-1)) and lowest in the first posture (0.35+/-0.02 1 min (-1)). Total energy cost throughout the practice of SN was 13.91 kcal and at an average of 3.79 kcal/min. During its practice highest HR was 101+-13.5 bpm. As an aerobic exercise SN seemed to be ideal as it involves both static stretching and slow dynamic component of exercise with optimal stress on the cardiorespiratory system.

Rube Jesintha and John Parthiban (2007) Studied the influence of yogic practices on resting pulse rate . breath holding time and cardio respiratory endurance of school Khokho players. For the study 32 school girls who were studying in Government
Higher Secondary school in Kalanivasal, Pudukkottai District, Tamilnadu, India were selected as randomly and assigned to two groups. Group I underwent yogic practices (n=16) and Group II (n=16) acted as control group. The data collected from the groups were statistically analysed with analysis of covariance (ANCOVA). Resting pulse rate, Breath holding time and cardio respiratory endurance showed significant difference between the groups.

Dhungel et al. (2008) conducted a study on the effect of alternate nostril breathing exercise on cardio respiratory functions, Pranayama (breathing exercise), one of the yogic techniques can produce different physiological responses in healthy individuals. The responses of Alternate Nostril Breathing (ANB) the Nadisuddhi Pranayama on some cardiorespiratory functions were investigated in healthy young adults. The subjects performed ANB exercise (15 minutes everyday in the morning) for four weeks. Cardio-respiratory parameters were recorded before and after 4- weeks training period. A significant increment in Peak expiratory flow rate (PEFR L/min) and Pulse pressure (PP) was noted. Although Systolic blood pressure (SBP) was decreased insignificantly, the decreases in pulse rate (PR), respiratory rate (RR), diastolic blood pressure (DBP) were significant. Results indicate that regular practice of ANB (Nadisuddhi) increases parasympathetic activity.

Padmadevi, (2007) investigated the effects of yogic practices, physical exercises and combination of both the trainings on selected physiological and psychological variables of college girls. The resting pulse rate, cardio respiratory endurance and breath holding time as physiological variables and anxiety, aggression, achievement motivation and self confidence as psychological variables. A hundred and twenty college women students were selected as subjects at random the age group of 17 to 21 years. Further, they were divided into four equal groups and the treatment was given as follows. group I- Physical training, group II –yogic practices, group III- Combination of both the training, and group IV- control group. Pre test was conducted for the entire four groups prior to the training and the post test was conducted after six weeks of experimental treatment. Analysis of covariance was used to find out the significant effects of the treatment groups. Scheffee’s post hoc test was used to find out the paired mean significant difference. It was concluded that combination of both trainings improves all the variables.
Amutha, (2010) conducted study to find out the effect of selected yogic exercise and pranayama on anxiety, VO2max and flexibility. For this purpose fifty male students were selected from various high and higher secondary schools in and around Chidambaram town. They were divided into two equal groups. one as experimental group doing underwent training for nine weeks, weekly five days, Monday to Friday between 6.00 a.m to 8.00 a.m. and control group (n=25) did not participate in any special training. The result of the study indicated that the anxiety was reduced significantly, maximal oxygen uptake and the flexibility increased significantly for the training group. It was concluded that the yogic exercise and had reduced the anxiety and increased the maximal oxygen uptake and flexibility.

Ramesh and Subramaniam (2011) conducted study on the effects of physical exercise training at different intensities on Body Mass Index (BMI), Basel metabolic rate (BMR) and body fat percentage (BF%) of obese adolescents. The present study has undertaken the survey method for identifying obese of the school going students. The researcher evaluated the existing data from school survey in Triunelveli town (6,732 boys) to measure the height and weight of the students (BMI). To achieve the purpose of this study thirty nine school boys were selected from St.Johns higher secondary school, and Sri Manthiramoorthy higher secondary school, in Tirunelveli town. Their age ranged from 12 to 18 years. They were divided in to three groups and designed as Experimental group ‘A’ Experimental group ‘B’ and Control group ‘C’. The Experimental group-A was given aerobic and calisthenics exercises, Experimental group-B underwent yogic exercise such as Asanas and Pranayama (breathing exercises) for a period of three months, both morning and evening for five days in a week, whereas control group-C is not involved any specific exercise programme other than their regular physical activities programme as per their school curriculum. The data were collected before and after the exercises programme and statistically analyzed by using analysis of covariance (ANCOVA). The result of study report that has significantly reduction on body mass index and body fat percentage after three month of aerobic exercise training programme. Basel metabolic rate has significant increased exercise in burning capacity for calories reduce in aerobic exercise for three month period. There was no significant reduction in the performance of selected BMI, BMR and BF% after three months yogic exercise training programme when compared with aerobic exercise as well as control group.
Harinath et al., (2004) had conducted the study on effects of Hatha yoga and Omkar meditation on cardio respiratory performance, psychological profile, and melatonin secretion. Thirty healthy men in the age group of 25-35 years volunteered for the study. They were randomly divided in two groups of 15 each. Group 1 subjects served as controls and performed body flexibility exercises for 40 minutes and slow running for 20 minutes during morning hours and played games for 60 minutes during evening hours daily for 3 months. Group 2 subjects practiced selected yogic asanas (postures) for 45 minutes and pranayama for 15 minutes during the morning, whereas during the evening hours these subjects performed preparatory yogic postures for 15 minutes, pranayama for 15 minutes, and meditation for 30 minutes daily, for 3 months. Orthostatic tolerance, heart rate, blood pressure, respiratory rate, dynamic lung function (such as forced vital capacity, forced expiratory volume in 1 second, forced expiratory volume percentage, peak expiratory flow rate, and maximum voluntary ventilation), and psychological profile were measured before and after 3 months of yogic practices. Serial blood samples were drawn at various time intervals to study effects of these yogic practices and Omkar meditation on melatonin levels. Yogic practices for 3 months resulted in an improvement in cardio respiratory performance and psychological profile. The plasma melatonin also showed an increase after three months of yogic practices. The systolic blood pressure, diastolic blood pressure, mean arterial pressure, and orthostatic tolerance did not show any significant correlation with plasma melatonin. However, the maximum night time melatonin levels in yoga group showed a significant correlation (r = 0.71, p < 0.05) with well-being score. These observations suggest that yogic practices can be used as psycho physiologic stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being. “Fitness level of American youth have shown a marked decline in the last decade according whether such a tendency persisted among students entering colleges, the authors evaluated 115 male and 143 female students for performance on the following fitness – related variables: (1) maximal oxygen consumption (estimated from A strand cycling protocol), (2) body composition (skin-fold techniques), (3) muscle endurance (sit up protocol), (4) muscle strength ( bench – press protocol),(5) joint flexibility (upper and lower body protocols). Although neither men nor women exhibited high levels of cardio-respiratory fitness, the women in the study showed higher relative levels than their male counter parts. Both groups showed excellent levels of muscle strength
(compared with normative standards), but they achieved only an average standard for muscle endurance. Findings of relatively low levels of cardiovascular fitness compared with level of muscle strength, particularly in men, seem to be a reflection of an in appropriate concentration of physical activity.

Ray, et.al. (2001) undertook a study to observe any beneficial effect of yogic practices during training period on the young trainees. 54 trainees of 20-25 years age group were divided randomly in two groups i.e. yoga and control group. Yoga group (23 males and 5 females) was administered yogic practices for the first five months of the course while control group (21 males and 5 females) did not perform yogic exercises during this period. From the 6th to 10th month of training both the groups performed the yogic practices. Physiological parameters like heart rate, blood pressure, oral temperature, skin temperature in resting condition, responses to maximal and sub maximal exercise, body flexibility were recorded. Psychological parameters like personality, learning, arithmetic and psycho Health ability, mental well being was also recorded. Various parameters were taken before and during the 5th and 10th month of training period. Initially there was relatively higher sympathetic activity in both the groups due to the new work/training environment but gradually it subsided. Later on at the 5th and 10th month, yoga group had relatively lower sympathetic activity than the control group. There was improvement in performance at sub maximal level of exercise and in anaerobic threshold in the yoga group. Shoulder, hip, trunk and neck flexibility improved in the yoga group. There was improvement in various psychological parameters like reduction in anxiety and depression and a better mental function after yogic practices. Hubert Dhanaraj (1974) studied the effects of yoga and 5Bx fitness plan on selected physiological parameters. The results indicated increase in basal metabolic rate, tidal volume in basal state. T-4 thyroxin, hemoglobin, Hemotocried blood cell PWC 130, vital capacity, chest expansion, breath holding time and flexibility after yoga training decreases in heart rate in barrel state and respiratory rate in barrel state were also observed. When yogic training was discontinued for six weeks, following the six weeks treatment, a significant declination in values of PWC130, flexibility and breath holding time were noticed.
Sukhdev Singh1, Vishaw Gaurav1 (2011) “Effects of a 6-week nadi-shodhana pranayama training on cardio-pulmonary parameters” The aim of the study is to assess the effects of a 6-week nadi-shodhana pranayama training on cardiopulmonary parameters. A group of 30 male healthy subjects were selected from department of physical education (T), Guru Nanak Dev University, Amritsar (Punjab, India), aged 18 – 24 years, volunteered to participate in the study. Subjects were assigned into two groups: A (experimental: N-15) and B (control: N-15). The subjects from Group A (experimental: N-15) were subjected to a 6-week nadishodhana pranayama training programme. This lasted 6 weeks and consisted of daily sessions, lasting 30 min. Heart rate was measured by counting radial pulse for a minute. Vital capacity was measured by spirometer. Both systolic and diastolic blood pressures were measured with the auscultatory method by using sphygmomanometer and stethoscope. Results showed that the vital capacity significantly improved (P<0.01) in experimental group compared with the control one. A significant decline in basal heart rate (P<0.01) and systolic blood pressure (P<0.05) was observed. In contrast, control subjects did not show any significant change in these parameters. ‘Nadi-shodhana Pranayama training programme may be recommended to improve vital capacity and control heart rate and blood pressure and may contribute to enhance health status and wellness.

Telles et al. (1994) this pranayama is also known as alternate nostril breathing as the thumb of the right hand is used to close the right nostril and the ring finger of the same hand is used to close the left nostril. One round consists of inhaling through one nostril for a defined length of time (varying from person-to-person) and exhaling for the same length of time the same side. This nostril is then closed and the same breath is repeated through the other nostril. In a controlled study is was shown that breathing through the right nostril resulted in a significant increase of 37% in baseline oxygen consumption, alternately breathing through both nostrils showed and 18% increase while breathing through the left nostril resulted in a 24% increase. The left nostril pranayama group showed an increase in volar galvanic skin resistance, the electrical resistance of the skin which is a measure of emo- tions in people that is part of the polygraph test. Fear, anger, startle response, sexual feelings are all among the emotions which may produce similar GSR responses. An increase is interpreted as a reduction in sympathetic nervous system activity.
Telles et al., (1993). Viloma means against the natural order of things. In viloma pranayama, inhalation or exhalation is done with several pauses. It teaches the practitioner how to fully utilise the entirety of the rib cage and how to direct the breath into specific areas of the chest ensuring a deep breath. Viloma can also be practiced through alternate nostrils and is called anuloma viloma. Viloma aerates the lungs and improves the muscle tone of the breathing muscles. Both anuloma viloma and viloma have been said to lower blood pressure, however the only controlled scientific study showed that there was an increase in systolic blood pressure probably due to cutaneous vasoconstriction as shown by the simultaneous decrease in digit pulse volume.

Saroja,(2011) Conducted the study on to find out the effect of yoga practice, physical exercise and combination of yoga practice, physical exercise on selected motor ability components, physiological variables among college men students. For these purpose sixty college men students were selected as subjects at random from various colleges in Sivagangai District, Tamilnadu, India and their age was 19-23 years. They were divided into four groups namely yoga group, physical exercise group, and yogic practice and physical exercise combined group and control group. The first three groups did yoga asanas, pranayama, Dhayana and physical exercise respectively for six weeks. The pre and post test were taken for all the subjects before and after the training respectively. Dependent variables are Motor ability components (Flexibility, Cardio Respiratory endurance) and Physiological variables (Resting pulse rate, Breath holding time) Independent variables (yoga, physical exercise, combination of yoga and physical exercises group and control group) were selected. This study concluded that the level of flexibility was improved greater by selected yogic practices that of physical exercises and combined training of yogic practices than that of physical exercises and endurance was significantly improved greater by selected combined activities that of physical exercises. Also physical exercises improve the cardio respiratory endurance greater than yogic practices. Yogic practices improved theresting pulse rate greater than physical exercise.
Amutha, (2010) conducted study to find out the effect of selected yogic exercise and pranayama on anxiety, VO2max and flexibility. For this purpose fifty male students were selected from various high and higher secondary schools in and around Chidamabaram town. They were divided into two equal groups. One as experimental group doing underwent training for nine weeks, weekly five days, Monday to Friday between 6.00 a.m to 8.00 a.m and control group (n=25) did not participate in any special training. The result of the study indicated that the anxiety was reduced significantly, maximal oxygen uptake and the flexibility increased significantly for the training group. It was concluded that the yogic exercise and had reduced the anxiety and increased the maximal oxygen uptake and flexibility.

Madanmohan and associates (2005) planned to undertake a comparative study of the “Effect of short term (three weeks) training in savitri (slow breathing) and bhashrika (fast breathing) pranayama on respiratory pressures and endurance, reaction time, blood pressure, heart rate, rate-pressure product and double product”. Thirty student volunteers were divided into two groups of fifteen each. Group I was given training in savitri pranayama that involves slow, rhythmic, and deep breathing. Group II was given training in bhashrika pranayama, which is bellows-type rapid and deep breathing. Parameters were measured before and after three-week training period. Savitri pranayama produced a significant increase in respiratory pressures and respiratory endurance. In both the groups, there was an appreciable but statistically insignificant shortening of reaction time. Heart rate, rate-pressure product and double product decreased in savitri pranayama group but increased significantly in bhashrika group. It is concluded that different types of pranayama produce different physiological responses in normal young volunteers.

Harinath et. al., (2004) had conducted the study on effects of Hatha yoga and Omkar meditation on cardio respiratory performance, psychologic profile, and melatonin secretion. Thirty healthy men in the age group of 25-35 years volunteered for the study. They were randomly divided in two groups of 15 each. Group 1 subjects served as controls and performed body flexibility exercises for 40 minutes and slow running for 20 minutes during morning hours and played games for 60 minutes during evening hours daily for 3 months. Group 2 subjects practiced selected yogic asanas (postures)
for 45 minutes and pranayama for 15 minutes during the morning, whereas during the evening hours these subjects performed preparatory yogic postures for 15 minutes, pranayama for 15 minutes, and meditation for 30 minutes daily, for 3 months. Orthostatic tolerance, heart rate, blood pressure, respiratory rate, dynamic lung function (such as forced vital capacity, forced expiratory volume in 1 second, forced expiratory volume percentage, peak expiratory flow rate, and maximum voluntary ventilation), and psychologic profile were measured before and after 3 months of yogic practices. Serial blood samples were drawn at various time intervals to study effects of these yogic practices and Omkar meditation on melatonin levels. Yogic practices for 3 months resulted in an improvement in cardio respiratory performance and psychological profile. The plasma melatonin also showed an increase after three months of yogic practices. The systolic blood pressure, diastolic blood pressure, mean arterial pressure, and orthostatic tolerance did not show any significant correlation with plasma melatonin. However, the maximum night time melatonin levels in yoga group showed a significant correlation ($r = 0.71$, $p < 0.05$) with well-being score. These observations suggest that yogic practices can be used as psycho physiologic stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being.

**Ivin Jabakumar (2007)** conducted a study on comparison of selected physical and physiological parameters between moderate altitude and sea level inhabitants. For the purpose, twenty-five sea level inhabitants from Chennai and twenty five moderate altitude inhabitants from kodaikanal were selected as subjects. Their age ranged from 18-25 years. The physical fitness variables (speed, agility, endurance) were selected and tested using 50mts dash, shuttle run cooper is 12 minutes run/walk respectively physiological variables such as breathe holding tune, pulse rate, blood pressure were selected and tested. The results of the study were there was significant difference in agility and breathe holding time and there was no significant between sea level and moderate altitude inhabitants on other selected variables.

**Ramesh V, Sakthignanavel D and Subramaniam P.K. (2010),** in their paper made an attempt to test the effect of Yogasanas and pranayama on the selected physiological variables of school boy's. The selected variables include systolic pressure, diastolic pressure, pulse rate and respiratory rate. To achieve this purpose of
the study, thirty boys in the age group of 12 to 15 years were selected from Jawaharlal Navodaya Vidyalaya Higher Secondary School. The subjects were randomly selected and divided equally into two groups as control group and experimental group. The experimental groups were given yogasanas and pranayama training for a period of twelve weeks, both mornings and evenings on five days a week. The control group did not participate in yogasana and pranayama training programme. The collected data were statistically analyzed by using analysis of covariance (ANCOVA). The experimental group had a significant improvement on the selected physiological variables than the control group. This is the confirmation to our hypothesis. Key words: Systolic Pressure, Diastolic Pressure, Pulse Rate and Respiratory rate.

**Upadhyay Dhungel K. et al. (2008)**, done a research on “Effect of Alternate Nostril Breathing Exercise on Cardiorespiratory Functions”. The study contains the following. Pranayama (breathing exercise), one of the yogic techniques can produce different physiological responses in healthy individuals. The responses of Alternate Nostril Breathing (ANB) the Nadisudhi Pranayama on some cardio-respiratory functions were investigated in healthy young adults. The subjects performed ANB exercise (15 minutes every day in the morning) for four weeks. Cardio-respiratory parameters were recorded before and after 4-weeks training period. A significant increment in Peak expiratory flow rate (PEFR L/min) and Pulse pressure (PP) was noted. Although Systolic blood pressure (SBP) was decreased insignificantly, the decreases in pulse rate (PR), respiratory rate (RR), diastolic blood pressure (DBP) were significant. Results indicate that regular practice of ANB (Nadisudhi) increases parasympathetic activity.

**Jesintha and Parthiban (2007)** studied the influence of yogic practices on resting pulse rate, breath holding time and cardio respiratory endurance of school kho-kho players. For the study 32 school girls who were studying in Government Higher Secondary School in Kalanivasal, Pudukkottai District, Tamil nadu, India were selected randomly and assigned to two groups. Group I underwent yogic practices (n=16) and Group II (n=16) acted as control group. The data collected from the groups were statistically analyzed with analysis of covariance (ANCOVA). Resting pulse rate, breath holding time and cardio respiratory endurance showed significant difference between the groups.
Gopal et al. studied the effect of Yogasanas and Pranayamas on blood pressure, pulse rate and some respiratory function. Two groups of male volunteers, 20-33 years in age and having the same experimental group consisted of 14 subjects in Yogasanas and Pranayamas for a period of six weeks. The group consisted of fourteen normal untrained subjects, who carried out non-yogic exercise - that is, long walk and playing light games. Pre-test and Post-test were conducted to both the groups before and after training. The results of both groups were compared. The trained persons had greater vital capacity, more tidal volume and less respiratory rate than the untrained group. The prescribed standard exercise increased the respiratory rate in both the groups who instead exhibited a corresponding increase in total volume.

Raj kumar and Durgesh (2007) investigated the effect of callisthenic exercise and yogic asanas on the improvement of trunk and shoulder flexibility among PU college students. Sixty girls studying in class twelfth in V.G. WOMEN’S PU College Gulbarga, were selected randomly and divided into three groups. Two groups A and B are experimental groups and C is the control group. Each group having twenty subjects under 16-18 years of age were served as subjects. Group A performed yogic asanas, Group B was subjected to calisthenics exercise and group C served as the control. The duration of the training programme was 8 weeks. The significant mean difference between the pre test and post test for trunk and shoulder flexibility were analysed using the ‘t’ ratio and Analysis of co covariance. The analysis showed that both the experimental groups brought about a significantly better performance as compared to the control group in the two variables. The analysis of data also revealed that yogic asana experimental group proved to be effective as compared to the callisthenic exercises group.

Jankiram, E. (2006) conducted a study on the effects of yoga and meditation on cognitive, Physical and hematological variables of school children aged between 11 to 16 years. Physical and cognitive factors determine sporting achievements in all the games and sport. He tested both experimental and control groups before the start. He gave 12 week’s yoga training and meditation to the experimental group and tested both yoga and control groups again. The results of the yoga experimental group (n=20) was significantly improved than those of the control group (n=20) in all
physical, cognitive and hematological variables (P<0.05) the assessments showed that the cognitive variables difference were much superior to the control group.

Chaudhary et al. (2010) evaluated the effects of aerobic and strength training on cardiac variables such as blood pressure, heart rate (HR), and metabolic parameters like cholesterol, high density lipoprotein (HDL), triglycerides and anthropometric parameters of obese women of Punjab. This study was performed as an experimental study, in which subjects were randomly selected. There were thirty obese women, aged between 35-45yrs with body mass index (BMI) of above 30. Subjects were grouped into control (n=10), aerobic training (n=10) and resistance training (n=10). Aerobic training was given for three days a week at 60-70% of maximum HR for 6 weeks. Resistance training (Delorme and Watkins Technique) was given for alternate days for 633 weeks. HR and blood pressure were measured before and after the exercise. Recovery HR was also measured. The findings of the study indicate statistically significant differences in recovery heart rate [Pre-exercise: 97.40±5.378 (mean ± standard deviation (SD)), post-exercise: 90.70±4.599, t=8.066, P<0.001] and in post-diastolic blood pressure [Pre-exercise: 85±3.265, post-exercise: 86.20±2.820, P<0.001] in aerobic training and in systolic blood pressure [Pre- and post-exercise] in both training groups (P<0.001). Significant differences were observed in very low-density lipoprotein [pre-exercise: 28.10±1.415, post exercise: 26.86±0.760, t=5.378] and HDL [pre-exercise: 45.40±3.533, post-exercise: 53.60±3.134, t=6.318] levels in aerobic training group with P<0.001. BMI and body fat percentage showed significant improvements in both training groups. Aerobic training is more beneficial and can be used as a preventive measure in patients who are at risk of developing cardiovascular diseases due to obesity.

John Walsakom (2000) evaluated the response of selected asanas on balance, flexibility, muscular endurance and reaction time among school boys. Thirty healthy, untrained school boys were selected from kalapet in Pondicherry and their age ranged from 10 to 15 years. The subjects were equally divided into two groups namely control and experimental group. The experimental group underwent selected asanas practice for one hour duration for ten weeks. Balance was measured using by stoke stand, flexibility was measured with the reliable equipment sit and reach box. Muscular endurance was measured using by bent knee sit ups and reaction time was measured using by nelson hand stick. The results of pre-test and post-test were
compared by using Analysis of Covariance (ANCOVA). The results revealed that Balance, flexibility, muscular endurance variables were significantly improved after practice of asanas.

Bal B.S, Kaur P.J (2000) the study was conducted to determine the effect of selected asanas in hata yoga on agility and flexibility. The subjects for the study were selected on the basis of random group design. Thirty (N=30) male students were selected as subject for the present study from D.A.V. Institute of Engineering and Technology, Jalandhar (Punjab), INDIA. All the subject stringed between the chronological age of 18-25 years. The selected subjects were further divided into two groups. Experimental treatment was then assigned to group “A” while group “B” acts as control. “Hexagonal Obstacle Test” was used to measure Agility whereas “Sit and Reach Test” was used to measure Flexibility.

R.AravindKumar1, Ramaprabha P, Bhuvaneswari (2013) Yoga is the science of right living which includes asana, pranayama and kriyas. Yoga consists of five principles which include proper exercise, proper relaxation, proper breathing, proper diet, positive thinking and meditation. Pranayama means control of breathing. As a technique pranayama is the practice of slow and deep breathing. In this modern world right from the adult to old age, occurrence of cardiovascular complications are more. So in our study we conducted a session on Nadi shodhana paranayma (NSP). To assess the effect on cardiovascular parameters among sixty healthy volunteers. Materials Methods: Sixty first year M.B.B.S students of Sri Ramachandra University served as subjects. Age group of subjects was around 18 – 20 years of both genders participated in our study. Of these 60 subjects, 30 motivated students were selected to receive 10 weeks pranayama Group I and remaining 30 students will serve as controls Group II. The following cardiovascular parameters like the Heart Rate (HR), Systolic Blood Pressure (SBP), and Diastolic Blood Pressure (DBP). Pulse Pressure (PP), Mean Arterial Pressure (MAP) was recorded. All the above parameters were measured before and after 10 weeks of NSP. The results were analyzed accordingly. Results: Nadi shodhana paranayma significantly decreases the HR, SBP, DBP, PP, and MAP after 10 weeks of yoga training. Heart Rate responses of yoga group significantly reduced from 79.43 ± 3.12 to 65.49 ± 2. Systolic Blood Pressure significantly reduced from 118 ± 3.30 to 101.74 ± 5.46. Diastolic Blood Pressure significantly reduced from 76 ± 2.43 to 63.12 ± 4.55. Pulse Pressure reduced from 44.18 ± 3.81 to 43.82 ± 3.92 in .
Arterial Pressure reduced from 86.34 ± 7.81 to 74.92 ± 4.81. All these significant changes are observed in yoga group after 10 weeks of NSP. No significant changes were observed in the Group II (control) subjects. Conclusion: we concluded that Nadi shodhana parayanma, increases the cardiovascular performances among the age group of around 18 – 20 years of both genders. The mechanism underlying for this responses is fully focused on domination ruled by Para sympathetic nerve over sympathetic nerve. This in turn reduces the HR, SP, DP, PP, and MAP.