CHAPTER-II

REVIEW OF RELATED LITERATURE

A Study of relevant literature is an essential step to get a comprehension of what has to been done with regard to the problem under any study. The purpose of the study was to find out the effect of varied packages of yogic practices on selected motor ability, Physiological, haematological and bio-chemical variables. The investigator went through several journals, books, magazines, articles and collected necessary and relevant materials for this study are presented in this chapter. The reviews of the literature have been classified under the following headings:

2.1 STUDIES ON MOTOR ABILITY VARIABLES

Chen T.L. et al. (2009), done a research on “The Effect of Yoga Exercise Intervention on Health Related Physical Fitness in School-Age Asthmatic Children”. The study contains the following. The purpose of this study was to investigate the effect of yoga exercise on the health-related physical fitness of school-age children with asthma. The study employed a quasi-experimental research design in which 31 voluntary children (exercise group 16; control group15) aged 7 to 12 years were purposively sampled from one public elementary school in Taipei County. The yoga exercise program was practiced by the exercise group three times per week for a consecutive 7 week period. Each 60-minute yoga session included 10 minutes of warm-up and breathing exercises, 40 minutes of yoga postures, and 10 minutes of cool down exercises. Fitness scores were assessed at pre-exercise (baseline) and at the seventh and ninth week after intervention completion. A total of 30 subjects (exercise group 16; control group 14) completed follow-up. Results included: 1. Compared with children in the general population, the study subjects 50 (n = 30) all fell below the 50th percentile in all five physical fitness items of interest. There was no significant difference in scores between the two groups at baseline (i.e., pre-exercise) for all five fitness items. 2. Research found a positive association between exercise habit after school and muscular strength and endurance among asthmatic children. 3. Compared to the control group, the exercise group showed favourable outcomes in terms of flexibility and muscular endurance. Such favourable outcomes remained evident even after adjusting for age, duration of disease and steroid use, values for which were unequally distributed between the two groups at baseline. 4. There was a tendency for
all item-specific fitness scores to increase over time in the exercise group. GEE analysis showed that yoga exercise indeed improved BMI, flexibility, and muscular endurance. After 2 weeks of self-practice at home, yoga exercise continued to improve BMI, flexibility, muscular strength, and cardiopulmonary fitness.

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.

Tran M.D. et al. (2001), done a research on “Effects of Hatha Yoga Practice on the Health-Related Aspects of Physical Fitness”. The study contains the following. 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.

Madanmohan, Mahadevan S.K. et al. (2008), done a research on “Effect of Six Weeks Yoga Training on Weight Loss Following Step Test, Respiratory Pressures, Handgrip Strength and Handgrip Endurance in Young Healthy Subjects”. The study contains the following. The present study was 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 year), 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 aspiratory 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 52 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.

Ross A and Thomas S. (2010), done a research on “The Health Benefits of Yoga and Exercise: A Review of Comparison Studies”. The study contains the following. Objectives: Exercise is considered an acceptable method for improving and maintaining physical and emotional health. A growing body of evidence supports the belief that yoga benefits physical and mental health via down-regulation of the
hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS). The purpose of this article is to provide a scholarly review of the literature regarding research studies comparing the effects of yoga and exercise on a variety of health outcomes and health conditions. Methods: Using PubMed (R) and the key word "yoga," a comprehensive search of the research literature from core scientific and nursing journals yielded 81 studies that met inclusion criteria. These studies subsequently were classified as uncontrolled (n = 30), wait list controlled (n = 16), or comparison (n = 35). The most common comparison intervention (n = 10) involved exercise. These studies were included in this review. Results: In the studies reviewed, yoga interventions appeared to be equal or superior to exercise in nearly every outcome measured except those involving physical fitness. Conclusions: The studies comparing the effects of yoga and exercise seem to indicate that, in both healthy and diseased populations; yoga may be as effective as or better than exercise at improving a variety of health-related outcome measures. Future clinical trials are needed to examine the distinctions between exercise and yoga, particularly how the two modalities may differ in their effects on the SNS/HPA axis. Additional studies using rigorous methodologies are needed to examine the health benefits of the various types of yoga. 53 Clay C.C. et al. (2005), done a research on “The Metabolic Cost of Hatha Yoga”. The study contains the following. To determine the metabolic and heart rate (HR) responses of hatha yoga, 26 women (19-40 years old) performed a 30-minute hatha yoga routine of supine lying, sitting, and standing asanas (i.e., postures). Subjects followed identical videotaped sequences of hatha yoga asanas. Mean physiological responses were compared to the physiological responses of resting in a chair and walking on a treadmill at 93.86 m.min (-1) [3.5 miles per hour (mph)]. During the 30-minute hatha yoga routine, mean absolute oxygen consumption (Vo(2)), relative Vo(2), percentage maximal oxygen consumption (%Vo(2)R), metabolic equivalents (METs), energy expenditure, HR, and percentage maximal heart rate (%MHR) were 0.45 L.min(-1), 7.59 ml.kg(-1).min(-1), 14.50%, 2.17 METs, 2.23 kcal.min(-1), 105.29 b.min(-1), and 56.89%, respectively. When compared to resting in a chair, hatha yoga required 114% greater O(2) (L.min(-1)), 111% greater O(2)(ml.kg(-1).min(-1)), 4,294% greater %Vo(2)R, 111% greater METs, 108% greater kcal.min(-1), 24% greater HR, and 24% greater %MHR. When compared to walking at 93.86 m.min(-1), hatha yoga required 54% lower O(2)(L.min(-1)), 53% lower O(2)(ml.kg(-1).min(-1)), 68% lower %Vo(2)R, 53% lower METs, 53% lower
kcal.min(-1), 21% lower HR, and 21% lower %MHR. The hatha yoga routine in this study required 14.50% Vo2 R, which can be considered a very light intensity and significantly lighter than 44.8% Vo2) R, for walking at 93.86 m.min (-1) (3.5 mph). The intensity of hatha yoga may be too low to provide a training stimulus for improving cardiovascular fitness. Although previous research suggests that hatha yoga is an acceptable form of physical activity for enhancing muscular fitness and flexibility, these data demonstrate that hatha yoga may have little, if any, cardiovascular benefit.

Hagins M, Moore W, and Rundle A (2007), did a research on “Does practicing hatha yoga satisfy recommendations for intensity of physical activity which improves and maintains health and cardiovascular fitness”. The study contains the following. Background: Little is known about the metabolic and heart rate responses to a typical hatha yoga session. The purposes of this study were 1) to determine whether a typical yoga practice using various postures meets the current recommendations for levels of physical activity required to improve and maintain health and cardiovascular fitness; 2) to determine the reliability of metabolic costs of yoga across sessions; 3) to compare the metabolic costs of yoga practice to those of treadmill walking. Methods: In this observational study, 20 intermediate-to-advanced level yoga practitioners, age 31.4 +/- 8.3 years, performed an exercise routine inside a human respiratory chamber (indirect calorimeter) while wearing heart rate monitors. The exercise routine consisted of 30 minutes of sitting, 56 minutes of beginner-level hatha yoga administered by video, and 10 minutes of treadmill walking at 3.2 and 4.8 kph each. Measures were mean oxygen consumption (VO2), heart rate (HR), percentage predicted maximal heart rate (%MHR), metabolic equivalents (METs), and energy expenditure (kcal). Seven subjects repeated the protocol so that measurement reliability could be established. Results: Mean values across the entire yoga session for VO2, HR, %MHR, METs, and energy/min were 0.6 L/kg/min; 93.2 beats/min; 49.4%; 2.5; and 3.2 kcal/min; respectively. Results of the ICCs (2,1) for mean values across the entire yoga session for kcal, METs, and %MHR were 0.979 and 0.973, and 0.865, respectively. Conclusion: Metabolic costs of yoga averaged across the entire session represent low levels of physical activity, are similar to walking on a treadmill at 3.2 kph, and do not meet recommendations for levels of physical activity for improving or maintaining health or cardiovascular fitness. Yoga practice
incorporating sun salutation postures exceeding the minimum bout of 10 minutes may contribute some portion of sufficiently intense physical activity to improve cardio respiratory fitness in unfit or sedentary individuals. The measurement of energy expenditure across yoga sessions is highly reliable.

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 KapalaBhathi (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 cardio respiratory 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 cardio respiratory system. Danucalov M.A. et al. (2008), done a research on “Cardio respiratory and Metabolic Changes during Yoga Sessions: The Effects of Respiratory Exercises and Meditation Practices”. The study contains the following. The novelty of this study was to investigate the changes in cardio respiratory and metabolic intensity brought about by the practice of pranayama’s (breathing exercises of yoga) and meditation during the same hatha-yoga session. The technique applied was the one advocated by the hatha-yoga system. Nine yoga instructors-five females
and four males, mean age of 44 +/−11, 6, were subjected to analysis of the gases expired during three distinct periods of 30 min: rest, respiratory exercises and meditative practice. A metabolic open circuit computerized system was applied (VO2000, Med Graphics-USA). The oxygen uptake (VO (2)) and the carbon dioxide output (VCO (2)) were statistically different (P <or= 0.05) during meditation and pranayama practices when compared with rest. The heart rate also suffered relevant reductions when results at rest were compared with those during meditation. A smaller proportion of lipids were metabolized during meditation practice compared with rest. The results suggest that the meditation used in this study reduces the metabolic rate whereas the specific pranayama technique in this study increases it when compared with the rest state.

Rathore B.S. et al. (2009), done a research on “Critical Analysis of Cardiovascular and Motor Fitness Abilities of Inter-University Players”. The study contains the following. The purpose of this study was to examine cardiovascular and motor fitness profile (abilities) of inter-university players of University of Rajasthan. An insignificant difference between individual game and team game players (t value of .06 was less than the table value of 1.96 required for ‘t’ test to be significant at 0.05 level with 118 degree of freedom) was observed in cardiovascular endurance, explosive strength, muscular strength and endurance of arms and shoulders, agility and total J.C.R. scores. Key Words: Cardiovascular profile, motor fitness, individual game players and team game players.

Chen K.M. et al. (2010), done a research on “Silver Yoga Exercises Improved Physical Fitness of Transitional Frail Elders”. The study contains the following. Background: Promoting the health of transitional frail elders (e.g., through therapeutic-based yoga exercises) is essential to reduce healthcare expenditures caused by chronic health problems. Objective: The purpose of this study was to determine the efficacy of 24 weeks of the senior-tailored silver yoga (SY) exercise program for transitional frail elders. Methods: A convenience sample of 69 elders in assisted living facilities were assigned randomly to the SY group (n = 38) or to the control group (n = 31) on the basis of the facilities where they resided, and 55 of them completed this quasi-experimental pretest and posttest study. Intervention was conducted three times per week, 70 minutes per session, for 24 weeks. Physical fitness (body composition, cardiovascular-respiratory functions, body flexibility,
muscle power and endurance, balance, and agility) were examined at baseline, at 12 weeks, and at the end of the 24th week of the study. Results: At the end of the study, the physical fitness indicators of participants in the SY group had improved significantly, and they had better physical fitness than participants in the control group (all p values < .05). Discussion: It was recommended that the SY exercises be incorporated as an activity program in assisted living facilities to promote the physical Fitness of transitional frail elders.

Madanmohan, Udupa K. et al. (2005), has done a research on “Effect of Slow and Fast Pranayams on Reaction Time and Cardio respiratory Variables”. The study contains the following. We planned to undertake a comparative study of the effect of short term (three weeks) training in savitri (slow breathing) and bhashrika (fast breathing) pranayams 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 savitripranayam that involves slow, rhythmic, and deep breathing. Group II was given training in bhashrikapranayam, which is bellows-type rapid and deep breathing. Parameters were measured before and after three week training period. Savitripranayam 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 savitripranayam group but increased significantly in bhashrika group. It is concluded that different types of pranayams produce different physiological responses in normal young volunteers.

Udupa K. et al. (2003), done a research on “Effect of Pranayam Training on Cardiac Function in Normal Young Volunteers”. The study contains the following. Systolic time intervals (STI) are non-invasive and sensitive tests for measuring the Ventricular performance. It has been reported that practice of pranayam modulates cardiac autonomic status and improves cardio-respiratory functions. Keeping this in view, the present study was designed to determine whether pranayam training has any effect on ventricular performance as measured by STI and cardiac autonomic function tests (AFT). Twenty four school children were randomly divided into two groups of twelve each. Group I (pranayam group) subjects were given training in nadishuddhi, mukh-bhashrika, pranav and savitripranayams and practiced the same for 20 minutes
daily for a duration of 3 months. Group II (control group) subjects were not given any pranayam training. STI (QS2, LVET and PEP) and AFT (RRIV and QT/QS2) were measured in both the groups at the beginning and again at the end of three months study period. Pranayam training produced an increase in RRIV and a decrease in QT/QS2, suggesting an enhanced parasympathetic and blunted sympathetic activity respectively. QS2, PEP and PEP/LVET increased significantly, whereas LVET was reduced significantly in pranayam group. In contrast, the changes in STI and AFT were much less marked in the control group. Our study shows that three months of pranayam training modulates ventricular performance by increasing parasympathetic activity and decreasing sympathetic activity. Further studies on a larger sample size may illustrate the underlying mechanism(s) involved in this alteration.

Madanmohan, Thombre D.P. et al. (1992), has done a research on “Effect of Yoga Training on Reaction Time, Respiratory Endurance and Muscle Strength”. The study contains the following. There is evidence that the practice of yoga improves physical and mental performance. The present investigation was undertaken to study the effect of yoga training on visual and auditory reaction times (RTs), maximum expiratory pressure (MEP), maximum inspiratory pressure (MIP), 40 mmHg test, breath holding time after expiration (BHT.exp), breath holding time after inspiration (BHTinsp), and hand grip strength (HGS). Twenty seven student volunteers were given yoga training for 12 weeks. There was a significant (P < 0.001) decrease in visual RT (from 270.0 +/- 6.20 (SE) to 224.81 +/- 5.76 ms) as well as auditory RT (from 194.18 +/- 6.00 to 157.33 +/- 4.85 ms). MEP increased from 92.61 +/- 9.04 to 126.46 +/- 10.75 mmHg, while MIP increased from 72.23 +/- 6.45 to 90.92 +/- 6.03 mmHg, both these changes being statistically significant (P < 0.05). 40 mmHg test and HGS increased significantly (P < 0.001) from 36.57 +/- 2.04 to 53.36 +/- 3.95 s and 13.78 +/- 0.58 to 16.67 +/- 0.49 kg respectively. BHT.exp increased from 32.15 +/- 1.41 to 44.53 +/- 3.78s (P < 0.01) and BHTinsp increased from 63.69 +/- 5.38 to 89.07 +/- 9.61 s (P < 0.05). Our results show that yoga practice for 12 weeks results in significant reduction in visual and auditory RTs and significant increase in respiratory pressures, breath holding times and HGS.

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 respiratory capacity 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.

2.2 STUDIES ON PHYSIOLOGICAL 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 NavodayaVidyalaya 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.

KewalKrishan and Sudhir Kumar Sharma (2009), done a research on “Effects of Yogic Practices and Callisthenic Exercises on Resting Pulse Rate Variable of Secondary School Boys”. The study contains the following. The objective of this research was to study the effects of yogic practices and callisthenic exercises on resting pulse rate variables of secondary school boys in Hamirpur district of Uttar Pradesh Total 120 boys subjects (40 yogic practices group, 40 calisthenics exercises group and 40 control group) were put under yogic practices and calisthenics exercises group a pretest was taken for all the 120 subjects. Six weeks training of yogic practices and calisthenics exercises was given to the respective groups. A post test was taken after six weeks of the training. Analysis of variance was applied to compare
the four groups, for their heart rate response pattern, and Scheffe's post hoc test was applied to find out the superiority of the group. The result of the study indicated that Resting pulse rate of yogic practices group was better than the other two groups.

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.

Anurodh Singh Sisodia and Satendra Singh Tomar (2009), done a research on “Effect of Anuloma Viloma Pranayama on Selected Respiratory Variables”. The study contains the following. The study was conducted on selected respiratory variables on 30 male college students, 15 students in each group (experimental & control) with the purpose to investigate the effect of anulomaviloma pranayama on selected respiratory variables. The selected respiratory variables were vital capacity, peak flow rate, positive breath holding time & negative breath holding time. To determine the effect of anulomaviloma pranayama on selected respiratory variables, analysis of covariance (ANCOVA) was employed at 0.05 level of significant. On the basis of results, the following conclusions were drawn: Significance improvements were found in relation to vital capacity (189.37), peak flow rate (13.44) & negative breath holding time (47.17). No significance effect was found on male students in relation to positive breath holding time (1.042). Keyword: Pranayama, Vital capacity & peak flow rate

An H. et al. (2010), done a research on “Measures of Heart Rate Variability in Women Following a Meditation Technique”. The study contains the following. Certain time domain, frequency domain and a nonlinear measure of heart rate variability are studied in women following a meditative practice called cyclic
meditation. The nonlinear measure studied is the sampling entropy. We show that there is an increase in the sampling entropy in the meditative group as compared to the control group. The time domain measure called PNNX is shown to be useful in distinguishing between the meditative state and a normal resting state. Penk C K. et al. (2004), done a research on “Heart Rate Dynamics during Three Forms of Meditation”. The study contains the following. Objective: This study was designed to quantify and compare the instantaneous heart rate dynamics and cardiopulmonary interactions during sequential performance of three meditation protocols with different breathing patterns. Background: We analyzed beat-to-beat heart rate and continuous breathing signals from 10 experienced meditators (4 females; 6 males; mean age 42 years; range 29-55 years) during three traditional interventions: relaxation response, breath of fire, and segmented breathing. Results: Heart rate and respiratory dynamics were generally similar during the relaxation response and segmented breathing. We observed high amplitude, low frequency (approximately 0.05-0.1 Hz) oscillations due to respiratory sinus arrhythmia during both the relaxation response and segmented breathing, along with a significantly (p<0.05) increased coherence between heart rate and breathing during these two maneuvers when compared to baseline. The third technique, breath of fire, was associated with a different pattern of response, marked by a significant increase in mean heart rate with respect to baseline (p<0.01), and a significant decrease in coherence between heart rate and breathing (p<0.05). Conclusions: These findings suggest that different meditative/breathing protocols may evoke common heart rate effects, as well as specific responses. The results support the concept of a "meditation paradox," since a variety of relaxation and meditative techniques may produce active rather than quiescent cardiac dynamics, associated with prominent low frequency heart rate oscillations or increases in mean resting heart rate. These findings also underscore the need to critically assess traditional frequency domain heart rate variability parameters in making inferences about autonomic alterations during meditation with slow breathing.

Telles S, Reddy S.K. and Nagendra H.R. et al. (2000), done a research on “Oxygen Consumption and Respiration Following Two Yoga Relaxation Techniques”. The study contains the following. The present study was conducted to evaluate a statement in ancient yoga texts that suggests that a combination of both "calming" and "stimulating" measures may be especially helpful in reaching a state of
mental equilibrium. Two yoga practices, one combining "calming and stimulating" measures (cyclic meditation) and the other, a "calming" technique (shavasan), were compared. The oxygen consumption, breath rate, and breath volume of 40 male volunteers (group mean +/- SD, 27.0 +/- 5.7 years) were assessed before and after sessions of cyclic meditation (CM) and before and after sessions of shavasan (SH). The 2 sessions (CM, SH) were 1 day apart. Cyclic meditation includes the practice of yoga postures interspersed with periods of supine relaxation. During SH the subject lies in a supine position throughout the practice. There was a significant decrease in the amount of oxygen consumed and in breath rate and an increase in breath volume after both types of sessions (2-factor ANOVA, paired t test). However, the magnitude of change on all 3 measures was greater after CM: (1) Oxygen consumption decreased 32.1% after CM compared with 10.1% after SH; (2) breath rate decreased 18.0% after CM and 15.2% after SH; and (3) breath volume increased 28.8% after CM and 15.9% after SH. These results support the idea that a combination of yoga postures interspersed with relaxation reduces arousal more than relaxation alone does.

Sodhi C., Singh S. and Dandona P.K. (2009), done a research on “A Study of the Effect of Yoga Training on Pulmonary Functions in Patients with Bronchial Asthma”. The study contains the following. The role of yoga breathing exercises, as an adjunct treatment for bronchial asthma is well recognized. One hundred twenty patients of asthma were randomized into two groups i.e., Group A (yoga training group) and Group B (control group). Each group included sixty patients. Pulmonary function tests were performed on all the patients at baseline, after 4 weeks and then after 8 weeks. Majority of the subjects in the two groups had mild disease (34 patients in Group A and 32 in Group B). Group A subjects showed a statistically significant increasing trend (P < 0.01) in % predicted peak expiratory flow rate (PEFR), forced expiratory volume in the first second (FEV1), forced vital capacity (FVC), forced mid expiratory flow in 0.25-0.75 seconds (FEF25-75) and FEV1/FVC% ratio at 4 weeks and 8 weeks as compared to Group B. Thus, yoga breathing exercises used adjunctively with standard pharmacological treatment significantly improves pulmonary functions in patients with bronchial asthma.

Raghuraj P, Telles S. (2008), done a research on “Immediate Effect of Specific Nostril Manipulating Yoga Breathing Practices on Autonomic and Respiratory Variables”. The study contains the following. The effect of right, left, and
alternate nostril yoga breathing (i.e., RNYB, LNYB, and ANYB, respectively) were compared with breath awareness (BAW) and normal breathing (CTL). Autonomic and respiratory variables were studied in 21 male volunteers with ages between 18 and 45 years and experience in the yoga breathing practices between 3 and 48 months. Subjects were assessed in five experimental sessions on five separate days. The sessions were in fixed possible sequences and subjects were assigned to a sequence randomly. Each session was for 40 min; 30 min for the breathing practice, preceded and followed by 5 min of quiet sitting. Assessments included heart rate variability, skin conductance, finger plethysmogram amplitude, breath rate, and blood pressure. Following RNYB there was a significant increase in systolic, diastolic and mean pressure. In contrast, the systolic and diastolic pressure decreased after ANYB and the systolic and mean pressure were lower after LNYB. Hence, unilateral nostril yoga breathing practices appear to influence the blood pressure in different ways. These effects suggest possible therapeutic applications.

Ray U.S. et al. (2001), done a research on “Aerobic Capacity & Perceived Exertion after Practice of Hatha Yogic Exercises”. The study contains the following. Background & Objectives: Reports on the effect of yogic exercises on aerobic capacity are few. There is also no literature available on the effect of yogic exercise on perceived exertion (PE) after maximal exercise. In this study the effect of training in Hatha yogic exercises on aerobic capacity and PE after maximal exercise was observed. Methods: Forty men from the Indian army (aged 19-23 years) were administered maximal exercise on a bicycle ergo meter in a graded work load protocol. The oxygen consumption, carbon dioxide output, pulmonary ventilation, respiratory rate, heart rate (HR) etc., at maximal exercise and PE score immediately thereafter were recorded. The subjects were divided into two equal groups. Twelve subjects dropped out during the course of study. One group (yoga, n = 17) practiced Hatha yogic exercises for 1 h every morning (6 days in a week) for six months. The other group (PT, n = 11) underwent conventional physical exercise training during the same period. Both groups participated daily in different games for 1 h in the afternoon. In the 7th month, tests for maximal oxygen consumption (VO2Max) and PE were repeated on both groups of subjects. Results: Absolute value of VO2Max increased significantly (P < 0.05) in the yoga group after 6 months of training. The PE scores after maximal exercise decreased significantly (P < 0.001) in the yoga group
after 6 months but the PT group showed no change. Interpretation & conclusion: The practice of Hatha yogic exercises along with games helps to improve aerobic capacity like the practice of conventional exercises (PT) along with games. The yoga group performed better than the PT group in terms of lower PE after exhaustive exercise.

Prasad K.V. et al. (1997), done a research on “Influence of Intensive Yoga Training on Physiological Changes in 6 Adult Women: A Case Report”. The study contains the following. The short-term effects of 4 weeks of intensive yoga practice on physiological responses in six healthy adult female volunteers were measured using the maximal exercise treadmill test. Yoga practice involved daily morning and evening sessions of 90 minutes each. Pre- and post-yoga exercise performance was compared. Maximal work output (Wmax) for the group increased by 21%, with a significantly reduced level of oxygen consumption per unit work but without a concomitant significant change in heart rate. After intensive yoga training, at 154 W min(-1) (corresponding to Wmax of the pre-yoga maximal exercise test) participants could exercise more comfortably, with a significantly lower heart rate (p < 0.05), reduced minute ventilation (p < 0.05), reduced oxygen consumption per unit work (p < 0.05), and a significantly lower respiratory quotient (p < 0.05). The implications for the effect of intensive yoga on cardio respiratory efficiency are discussed, with the suggestion that yoga has some transparently different quantifiable physiological effects to other exercises. Blumenthal J.A. et al. (1989), done a research on “Cardiovascular and behavioural Effects of Aerobic Exercise Training in Healthy Older Men and Women”. The study contains the following. The cardiovascular and behavioural adaptations associated with a 4-month program of aerobic exercise training were examined in 101 older men and women (mean age = 67 years). Subjects were randomly assigned to an Aerobic Exercise group, Yoga and Flexibility control group, or a Waiting List control group. Prior to and following the 4-month program, subjects underwent comprehensive physiological and psychological evaluations. Physiological measures included measurement of blood pressure, lipids, bone density, and cardio respiratory fitness including direct measurements of peak oxygen consumption (VO2) and anaerobic threshold. Psychological measures included measures of mood, psychiatric symptoms, and neuropsychological functioning. This study demonstrated that 4 months of aerobic exercise training produced an overall 11.6% improvement in peak VO2 and a 13% increase in anaerobic threshold. In
contrast, the Yoga and Waiting List control groups experienced no change in cardiorespiratory fitness. Other favourable physiological changes observed among aerobic exercise participants included lower cholesterol levels, diastolic blood pressure levels, and for subjects at risk for bone fracture, a trend toward an increase in bone mineral content. Although few significant psychological changes could be attributed to aerobic exercise training, participants in the two active treatment groups perceived themselves as improving on a number of psychological and behavioural dimensions.

Pomidori L et al. (2009), done a research on “Efficacy and Tolerability of Yoga Breathing in Patients with Chronic Obstructive Pulmonary Disease: A Pilot Study”. The study contains the following. Purpose: Yoga-derived breathing has been reported to improve gas exchange in patients with chronic heart failure and in participants exposed to high-altitude hypoxia. We investigated the tolerability and effect of yoga breathing on ventilator pattern and oxygenation in patients with chronic obstructive pulmonary disease (COPD). Methods: Patients with COPD (N = 11, 3 women) without previous yoga practice and taking only short-acting beta2-adrenergic blocking drugs were enrolled. Ventilator pattern and oxygen saturation were monitored by means of inductive plethysmography during 30-minute spontaneous breathing at rest (sb) and during a 30-minute yoga lesson (y). During the yoga lesson, the patients were requested to mobilize in sequence the diaphragm, lower chest, and upper chest adopting a slower and deeper breathing. We evaluated oxygen saturation (SaO2%), tidal volume (VT), minute ventilation (E), respiratory rate (i>f), aspiratory time, total breath time, fractional aspiratory time, an index of thoracic abdominal coordination, and an index of rapid shallow breathing. Changes in dyspnea during the yoga lesson were assessed with the Borg scale. Results: During the yoga lesson, data showed the adoption of a deeper and slower breathing pattern (VTsb L 0.54[0.04], VTy L 0.74[0.08], P = .01; i>fsb 20.8[1.3], i>fy 13.8[0.2], P = .001) and a significant improvement in SaO2% with no change in E (SaO2%sb 91.5%[1.13], SaO2%y 93.5%[0.99], P = .02; Esb L/min 11.2[1.1], Ey L/min 10.2[0.9]). All the participants reported to be comfortable during the yoga lesson, with no increase in dyspnea index. Conclusion: We conclude that short-term training in yoga is well tolerated and induces favorable respiratory changes in patients with COPD.

Danucalov M.A. et al. (2008), done a research on “Cardio respiratory and Metabolic Changes during Yoga Sessions: The Effects of Respiratory Exercises and
Meditation Practices”. The study contains the following. The novelty of this study was to investigate the changes in cardio respiratory and metabolic intensity brought about by the practice of pranayamas (breathing exercises of yoga) and meditation during the same hatha-yoga session. The technique applied was the one advocated by the hatha-yoga system. Nine yoga instructors-five females and four males, mean age of 44+/11, 6, were subjected to analysis of the gases expired during three distinct periods of 30 min: rest, respiratory exercises and meditative practice. A metabolic open circuit computerized system was applied (VO2000, Med Graphics-USA). The oxygen uptake (VO2) and the carbon dioxide output (VCO (2)) were statistically different (P ≤ 0.05) during meditation and pranayama practices when compared with rest. The heart rate also suffered relevant reductions when results at rest were compared with those during meditation. A smaller proportion of lipids were metabolized during meditation practice compared with rest. The results suggest that the meditation used in this study reduces the metabolic rate whereas the specific pranayama technique in this study increases it when compared with the rest state.

Rajakumar J, (2010), quoted the purpose of the study is to analyze the impact of yogic practices and physical exercises on selected physiological variables among the intercollegiate soccer players. To achieve this purpose, sixty (60) male intercollegiate soccer players from the various colleges; Chennai were selected at random. Their age ranged between 17 to 22 years. 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 underwent 12 weeks of training namely; yogic practices and physical exercises respectively, whereas the control group (Group C) maintained their daily routine activities and no special training was given. The subjects of the three groups were tested using standardized tests and procedures on selected physiological variables before and after the training period to find out the training efforts in the following test items: Resting pulse rate through stethoscope, Breath holding time through digital stop watch, Peak flow rate through Wright's peak flow meter. The collected data were analyzed statistically through Analysis of Co-variance (ANACOVA) and Schiff's post hoc test to find out the pre and post training performances, compare the significant difference between the adjusted final means and the better group. The yogic practice group showed significant improvement due to 12 weeks training on resting pulse rate,
S. Chidambara Raj (2012) the purpose of the present study was to find the effect of yogic practice and physical exercise on muscular strength, self concept and blood pressure (both systolic and diastolic). For this purpose forty-five women’s students studying in various faculties (except physical education, fine arts and yoga students) of Annamalia University (TN) in the age group of 18-23 years were selected. They were divided into three equal groups, in which group-I underwent yoga practice group –II underwent physical exercises and group-III selected as control group who were not allowed to participate in any special training apart from their regular curricular activities. The training period for this study was five days a week for eight weeks. Prior and after the training period, the subjects were tested for muscular strength, self-concept and blood pressure (systolic and diastolic). The Analysis of covariance (ANCOVA) was applied to find out which group has better in performance. Whenever, ‘F’ ratio for adjusted test was found to be significant for adjusted post-test means Scheffe’s test was followed, as a post-hoc test to determine which of the paired mean differ significantly. It was concluded from the results of the study that after yoga practice and physical exercises periods, both the training improves the muscular strength and self-concept and a significant decrease was found on the blood pressure for the both the experiments group. The results of the study also shown that there was no significant difference was found between the experiment.

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 this 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, 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 that of physical exercises and combined training of yogic practices than that of physical exercises and endurance was significantly improved greater by selected combined activity that of physical exercises. Also physical exercises improve the cardio respiratory endurance greater than yogic practices. Yogic practices improved the resting 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.

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 trainingprogramme 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 sleeted 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
The purpose of the study was to find out the effect of Gymnastics exercises and Yoga on selected Physical performance, Physiological and Bio-chemical variables among college students. Ninety College women students were selected as subjects for this study and were divided into three groups namely control, yoga and gymnastics exercise groups. The age group of the subject was 18 to 21 years. To assess the effect of 12 weeks training for gymnastics and Yogic programme and following dependent variables were chosen, vital capacity, heart rate, breath holding time, systolic blood pressure, diastolic blood pressure, blood sugar and cholesterol, endurance, speed and abdominal strength. The obtained data were statistically analysed through ANCOVA to test the significant difference and the result showed that the Gymnastic exercise and yogic training brought significant improvement among the college women on all variables except in diastolic blood pressure. (Divya and Shenbagavalli, 2010). The purpose of the study was to find out the effect of yogasana on selected physical and physiological parameters. To achieve this purpose thirty men students studying Bachelor’s degree in the Department of Physical Education and Sports Science students of Annamalai University, Chidambaram, Tamilnadu, India were selected as subjects at random. The selected subjects were divided into two equal groups of fifteen subjects each, such as yogasana group and control group. The group-I underwent yogasana for three days per week for twelve weeks. The control group did not participated in any special training programme apart from their regular physical education activities as per their curriculum. Among the physical and physiological parameters, the following variables such as leg strength and breath holding time were selected. Leg strength was measured by using leg lift with dynamometer; breath holding time was measured by using holding the breath for time was measured. All the subjects of both groups were tested on selected physical and physiological parameters at prior and immediately after the training programme. The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significant to test the “F” ratio obtained by the analysis of covariance was fixed at .05 level confidences.
which was considered as an appropriate. The results of the study showed that there was a significant difference between yogasana group and control group on selected criterion variables such as leg strength and breath holding time. And also it was found that there was a significant improvement on selected criterion variables namely leg strength and breath holding time due yogasana. (Surenthini and Karthikeyan, 2010).

Samsudeen and Kalidasan (2010) examined the influence of game-specific field training and yogic practices on selected physical, physiological, psychological and performance variables among college level Cricketers. Methodology: subjects sixty four college level Cricket players were selected as subject and their age range between 18 to 25 years. Statistical techniques: The Analysis of Covariance was used to analyze the collected data. Scheffe’s test is to be used as post hoc test to determine which of the paired mean difference is significant. Results: The results are presented in bar diagram which reveals that there was significant difference among the groups. Group-II has shown significant improvement in all the selected parameters among college level cricket players. As limited research has focused on the physiological responses associated with cricket activity, the aim of this pilot study was to measure selected physiological responses during batting in a simulated high-scoring 1-day cricket game. Ten male university cricketers performed a batting specific work bout consisting of four sprints per over (six balls) for a seven over period. Testing was conducted outdoors with players wearing full batting gear. All experimentation was conducted under temperate environmental conditions. During the simulated work bout, a portable on-line metabolic system (the k4b(2)) was attached to the subjects for the continuous assessment of selected physiological variables including heart rate (HR), ventilation (F(B), V(T) and V(E)), oxygen uptake (V(O2)) and metabolic carbon dioxide (V(CO2)) production. Energy expenditure was calculated from the oxygen consumption responses and substrate use was calculated from the V(O2)/V(CO2) responses. The results demonstrate that although the first over carried a statistically (p<0.05) lower energetic cost than the remaining six overs, most physiological responses stabilised thereafter. This excluded the heart rate responses which increased significantly (p<0.05) during the first three overs after which marginal increases were observed with no statistical difference between the last four overs (heart rate ranged from 149+/−19bt min(-1) in the fourth over to 155+/−18bt
min(-1) in the last over). There was a mean energy expenditure of 2536kJh (-1) over the duration of the work bout (Christie, Todd AI and King, 2008) The aim of the present study was to investigate the relationship between physiological and performance responses during repeated 6-over fast-bowling spells. Six, first-class, medium-fast bowlers performed 2x6-over spells separated by 45 min of light activity. The 6-over spells were based on the Cricket Australia fast bowling skills test that is a set order of deliveries at a grid-based target. Ball speed, accuracy and full and final 5-m run-up speed were measured on each ball. Nude mass, heart rate, corte temperature, capillary blood lactate, pH and glucose, perceptual measures of RPE and muscle soreness (MS) and repeated vertical jump efforts were measured prior to, during and following each spell. Results indicated no Review of Related Literature decrement (P=0.41) and small effect sizes (d<0.2) in bowling speed (125.7+/−5.1 and 125.4+/−4.5 km.h(-1)) or accuracy (40.4+/−16.1 and 41.6+/−18.0 AU) between spells 1 and 2. No differences (P=0.6–20.8) were present between spells for heart rate, core temperature, lactate, pH, glucose, RPE, MS or vertical jump. Only final 5-m run-up speed showed a large correlation with ball speed (r=0.70), while accuracy and speed were not correlated (r=0.05). In conclusion, repeated 6-over spells in well-trained bowlers results in minimal performance decrement in mild conditions (22 degrees C). As faster bowlers had faster final 5-m run-up speeds, the maintenance of high final 5-m run-up speeds might be important to maintaining bowling speed. Future research should also include a third bowling spell and warmer environmental conditions. 

Duffield, Carney and Karppinen (2009) The purpose of the study is to find out the effect of specific yogic exercises programme and combination of specific yogic exercises with autogenic training programme on selected physiological variables such as pulse rate, vital capacity, percent body fat, psychological variables such as job anxiety, occupational stress and biochemical variables such as high density lipoprotein, low density lipoprotein and fasting blood sugar of the college men students. Sixty Men students in the age group of 20 to 30 years from the Alagappa University were randomly selected and served as the subjects for the purpose of this study. The study was formulated as a random group design consisting of specific yogic exercises and combination of specific yogic exercise with autogenic training groups. The subjects (N=60) were at random divided into three equal groups.
Experimental group I - was administered specific yogic exercise group, Experimental group II- underwent combination of specific yogic exercises with autogenic training group and control group. All the groups were subjected to pre-test prior to the experimental treatment. The experimental groups participated in their respective duration of 12 weeks, six days in a week throughout the study. Analysis of Co-variance (ANACOVA) was applied to determine the significance of mean difference between the three groups. When F-ratio was found to be significant, the Scheffe’s Post Hoc test was applied to test the significance of pairs of the adjusted final group means. Practice of the combination of specific yogic exercises with autogenic training and specific yogic exercises programme is significantly effective in promoting desirable changes in the dependent variables. Keywords: Pulse rate, Vital capacity, Percent body fat,

Asian Journal Physical Education and Computer Science in Sports Volume No.8, No.1.pp86-89 Journal Impact Factor 0.5190 A Study on Effect of Yoga Exercises for development of Physical Fitness among College Girls Students of Aurangabad in India Dr. Shafioddin Sharfoddin Shaikh Dean, Faculty of Physical Education, Dr. Baba Saheb Ambedkar Marathwada University, Aurangabad, India Dr. Mohd. Abdul Bari Associate Professor, Maulana Azad College of Arts, Science and Commerce, Aurangabad Abstract: Background: Yoga is one of the six orthodox systems of Indian philosophy. When mind, intellect, & self are under control, freed from restless desire, so that they rest in the spirit within, a man becomes a Yukta - one in communion. Yoga is a systematic discipline, originated in India, for self realization.. One may select one Asana, or one may select many Asanas. In the beginning while learning, it may be uncomfortable as any new thing is always uncomfortable in the beginning but after some practice the same becomes comfortable. The objective of the study is to improve the Physical fitness through Yoga among college girl students. It was hypothesized that yogic exercise would be more effective in improving Physical fitness than all other interventions. Material and Methods: The purpose of the present study to find out the effect of Yoga exercises for the development of Physical fitness among College Girl Students of Aurangabad. The sample for the present study consists of 40 college girls of Aurangabad out of which 20 are experimental group and 20 are controlled group. Yoga exercises were given to experimental group on alternate days i.e. three sessions per week and controlled group
were given the general training of Physical exercises for eight weeks. To assess
Physical fitness the 50 Meters Run, Shuttle Run and 600 Yard Run is conducted in
Pre Test and Post Test on both groups Results: The results related to the hypothesis
have been recorded. The difference between the between pre and post-test in
experimental Group and control group is highly significant. Discussion and
conclusion: It has been observed from the Analysis of data that fitness variables like
speed, agility and endurance were improved within the experimental group. Key
Word Yoga, Physical Exercises etc.

Rajakumar (2010) in his study analyze the impact of yogic practices and
physical exercises on selected physiological variables among the intercollegiate
soccer players. To achieve this purpose, sixty (60) male intercollegiate soccer players
from the various colleges; Chennai were selected at random. Their age ranged
between 17 and 22. 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 underwent 12 weeks of
training namely; yogic practices and physical exercises respectively, whereas the
control group (Group C) maintained their daily routine activities and no special
training was given. The subjects of the three groups were tested using standardized
tests and procedures on selected physiological variables before and after the training
period to find out the training efforts in the following test items: Resting pulse rate
through stethoscope, Breath holding time through digital stop watch, Peak flow rate
Review of Related Literature through Wright's peak flow meter. The collected data
were analyzed statistically through Analysis of Co-variance (ANACOVA) and
Scheffe’s post hoc test to find out the pre and post training performances, compare the
significant difference between the adjusted final means and the better group. The
yogic practice group showed significant improvement due to 12 weeks training on
resting pulse rate, breath holding time and peak flow rate compared to the physical
exercise and control group. In the overall training effects in terms of improved
number of physiological variables and their magnitude of improvement through
training, yogic practice group is found to be the better group The vital role played by
yoga i.e. physical fitness, fitness related to health, skill and performance has assumed
tremendous importance in recent times. A review of research papers on yoga
practices, physical exercises and its relation to metabolic changes is conducted at
Vivekananda Kendra Yoga Research Foundation, Jigani, and Bangalore. The goal of the review was to establish a comprehensive literature review and provide a rationale for future research concerning metabolic changes during yoga practice. Computer searches were conducted using medline, pubmed, along with library search, and review of published journals and standard textbooks. An elaborate list of energy expenditure pattern of various physical activities is available but little documented for yogic exercises. Reviews are not large and need extensive research coverage. There is lack of replicated studies which will confirm the methods results. Evidences suggest yoga as a mind/body approach which has very vast application. The vital role played by yoga i.e. physical fitness, fitness related to health, skill and performance has assumed tremendous importance in recent times. The lifestyle changes leading to positive energy balances has been the causative factor for many of the metabolic disorders like hypertension, diabetes malites, cardiovascular diseases and obesity and related problems. Yoga, which is a time-tested method, has shown great positive influence on physical, mental, psychological, social and spiritual personalities of a person. With the above in background various research works have been undertaken to measure the changes that take place during yoga practice. The measurement of metabolic changes is one of them.

Chaya (2006) 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, Tamilnadu, 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. This study aims to provide a physiologic profile of professional cricketers and note positional differences at the start of the 2007/08 competitive season. Fifteen participants (9 bowlers, 6 batsmen) aged 25.0 ± 5.0 years (mean ± SD) took part in this study. Participants (bowlers and batsmen) completed a series of field-based fitness assessments: body composition (sum of 7 skinfolds, 72.5 ± 16.5 and 65.5 ± 19.3 mm, respectively), flexibility (sit and reach 8.1 ± 10.3 and 6.0 ± 6.2 cm, respectively),
predicted maximal oxygen uptake (multistage shuttle run, 54.1 ± 2.8 and 56.1 ± 4.5 ml-1 kg-1 min-1, respectively), upper- (medicine ball throw, 7.7 ± 0.6 and 7.0 ± 0.1 m, respectively) and lower- body strength (countermovement jump, 45.7 ± 5.8 and 43.9 ± 4.1 cm, respectively), speed (sprint 17.7 m, 2.76 ± 0.6 and 2.77 ± 0.1 s, respectively), and explosive power (repeated jump, 31.0 ± 2.0 and 34.1 ± 4.8 cm, respectively). The data provided the physical fitness profile for each player, which, compared with normative data, identified that this cohort of professional cricketers had some superior fitness parameters compared with the general population, and where applicable, were comparable with other professional athletes. In addition, after effect size calculations, the results showed that some Review of Related Literature physical fitness differences existed between playing positions. Cricket professionals possess a superior level of physical fitness and strength, and conditioning coaches should seek to progress these physical parameters and further identify position-specific physical requirements to progress the game. (Johnstone and Ford, 2010)

2.3 STUDIES ON PSYCHOLOGICAL VARIABLES

Javnbakht M. (2009) Yoga and physical exercise has been perceived as a method of stress management technique, and is assisting in alleviating depression and anxiety disorders. The present study was carried out to observe and evaluate the influence of yoga and exercise for getting relief from the symptoms of depression and anxiety in women who were given yogic exercise to a yoga clinic.

Methods: Women are involved a convenience sample for the study, that were undergone to yoga practice from July 2006 to July 2007. At the admission the women were evaluated by using a personal information questionnaire well as Beck and Spielberger tests. All the women participants were randomly selected and divided into two groups as experimental group and a control group. For experimental group (n=34) participants has assigned in yoga practice, twice in a week for two months and the duration of each class was fixed for 90 minutes. The control groups (n=31) was not assigned any practice of yoga exercise and it was treated as a waiting list and did not receive any yoga clinic. After the completion of two months again both groups were examined and evaluated for study period.
Results: The average prevalence of depression in the experimental group pre and post Yoga intervention was 12.82+/−7.9 and 10.79+/−6.04 respectively, it is statistically insignificant decrease (p=0.13). However, whereas in the experimental group in yoga classes has showed a significant decrease in state anxiety (p=0.03) and trait anxiety (p<0.001).

Conclusions: By participation and practicing regular yoga exercises for the duration of two-months can able to lead significant reduction in perceived and expected levels of anxiety in women who suffer from depression and anxiety disorders. This study suggests that yoga can be considered as a complementary therapy or an alternative method for medical therapy or an alternative method for medical therapy in the treatment of depression and anxiety disorders.

Saeed SA (2010)66, in the therapeutic aspect of Anxiety and depression are the most common conditions being observed in the present era. With this, people seeking the remedy and treatment with complementary and alternative therapies, such as exercise, meditation tai chi, qigong, and yoga for cited. By adopting and use of these therapies has increasing as complimentary for the remedies. Much scientific research of physical exercises and yoga practice has observed a significance effect, and no activity controls and comparable with established depression and anxiety treatments. High-energy exercise (i.e., weekly expenditure of at least 17.5 kcal per kg) and frequent aerobic exercise (i.e., at least three to five times per week) reduce symptoms of depression more than less frequent or lower-energy exercise. Mindful meditation and exercise have significance effects as therapeutic treatments for depressive disorders, although some studies show multiple methodological weaknesses. As well as for anxiety disorders, physical exercise and yoga practice has shown positive effects, but there are far less data on the effects of exercise on anxiety than for Javnbakht M et.at. effects of yoga on depression and anxiety of women. Psychiatry Department of Islamic Azad University, Mashhad Branch-22 Bahman Hospital, Mashhad. Iram, 2009 May; 15(2):102-4 Epub 2009 Mar 2r0. exercise on depression. Tai chi, qigong, and meditation have not shown effectiveness as alternative treatments for depression and anxiety.

Darwin Nelson (2005) in his research related to 'Emotional Intelligence and Emotional Maturity' says that if we want our children to be emotionally mature, we
must focus on their early childhood education; which affect certain level of social and emotional maturity.

**Tikhe Sham Ganpat, Sasmita Dash and Nagendra Hongasandra Ramarao**

Students need emotional intelligence (EI) for their better academic excellence in the modern era. There are three important psychological dimensions of EI: Emotional sensitivity (ES), emotional maturity (EM) and emotional competency (EC), which motivates the students to recognize and practice truthfully, interpretation of honesty and handling the situation tactfully the dynamics of their behavioral pattern. The study was framed to assess Emotional Sensitivity in the students who were undergone in yogic exercise therapy program in the form of yoga instructor's course (YIC) module. One hundred and eighty four YIC students with 25.77 ± 4.85 years of mean age were participated in this study for the time of 21 days (a single group pre-post design). The pre and post test data were collected for Emotional Sensitivity the data was collected before (pre) and after (post) the Yoga Instructor’s Course module by administering the Emotional Quotient test which was framed and developed by Dr Dalip Singh and Dr N K Chadha.

**Results:** The data analysis observed 3.63% significant increase ($P < 0.01$) in Emotional Sensitivity.

**Conclusion:** The present study suggests and recommends that yoga instructor's course (YIC) module can result in improvement of Emotional Sensitivity among university students, thus it is supporting in all the way for their academic excellence and get success.

**2.4 SUMMARY OF THE LITERATURE**

The investigator has collected all the reviews related to yogic practices on related to motor ability, physiological and Psychology were Collected from the library of National University of Physical Education, Gwalior and TamilNadu Physical Education University, Chennai and on the internet to provide sufficient knowledge to the readers and for the effective analysis of the present study. Also the reviews show that, the effect of yogic practices that there were significant changes on physiological, psychological and bio chemical variables. The investigator has found much more studies made on different yogic practices.