CHAPTER-II

REVIEW OF RELATED LITERATURE

The review of literature is instrumental in the selection of the topic, formation of hypothesis and deductive reasoning leading to the problem. It helps to get a clear idea and supports the finding with regard to the problem under study.

The review of literature is instrumental in the formation of hypotheses and to get a full picture of what done with regard to the problem under study. Such a review brings about a deep and clear perspective of the overall field. Now a day the educational program of any type is characterized by reforms and innovative ideas. It seems to be necessary one to formulate such a reviews of various scholars’ works. We can bring out a deep insight and clear perspective of the overall field in such reviews. Such collected review have been presented in logical order, in order to importance and in sequence of merit. This chapter is a step to get full picture of what has been done and said with regard to the problem under study. The review of literature in given as follows.

2.1 STUDIES ON YOGA

Carei TR, et.al, (2010) studied Randomized controlled clinical trial of yoga in the treatment of eating disorders. This was a pilot project designed to assess the effect of individualized yoga treatment on eating disorder outcomes among adolescents receiving outpatient care for diagnosed eating disorders (anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified). They used the methodology for this study were a total of 50 girls and 4 boys aged 11-21 years were randomized to an 8-week trial of standard care vs. individualized yoga plus standard care. The No Yoga group was offered yoga after study completion as an incentive to maintain participation. Outcomes evaluated at baseline, end of
trial, and 1-month follow-up included Eating Disorder Examination (EDE), Body Mass Index (BMI), Beck Depression Inventory, State-Trait Anxiety Inventory, and Food Preoccupation questionnaire. Results of the study were the Yoga group demonstrated greater decreases in eating disorder symptoms. Specifically, the EDE scores decreased over time in the Yoga group, whereas the No Yoga group showed some initial decline but then returned to baseline EDE levels at week 12. Food preoccupation was measured before and after each yoga session, and decreased significantly after all sessions. Both groups maintained current BMI levels and decreased in anxiety and depression over time. Individualized yoga treatment decreased EDE scores at 12 weeks, and significantly reduced food preoccupation immediately after yoga sessions. Yoga treatment did not have a negative effect on BMI. Results suggest that individualized yoga therapy holds promise as adjunctive therapy to standard care.

Udupa K. (2002) conducted the study on Modulation of cold presser-induced stress by shavasan in normal adult volunteers. This study was planned to determine if shavasan could modulate the physiological response to stress induced by cold pressor test (CPT) and the possible mechanisms involved. Ten normal adults were taught shavasan and practiced the same for a total duration of seven days. RR interval variation (RRIV), deep breathing difference (DBD), and heart rate, blood pressure & rate-pressure-product (RPP) response to CPT were measured before and immediately after shavasan. Shavasan produced a significant increase in DBD and an appreciable but statistically insignificant increase in RRIV suggesting an enhanced parasympathetic activity. Significant blunting of cold pressor-induced increase in heart rate, blood pressure and RPP by shavasan was seen during and even five minutes after CPT suggesting that shavasan reduces the load on the heart by blunting the sympathetic response. It is concluded that shavasan can enhance one's ability to
withstand stress induced by CPT and this ability can be achieved even with seven days of shavasan training.

Khalsa SB. (2004), conducted the study on Treatment of chronic insomnia with yoga: a preliminary study with sleep-wake diaries. Yoga treatment was evaluated in a chronic insomnia population consisting of sleep-onset and/or sleep-maintenance insomnia and primary or secondary insomnia. Participants maintained sleep-wake diaries during a pretreatment 2-week baseline and a subsequent 8-week intervention, in which they practiced the treatment on their own following a single in-person training session with subsequent brief in-person and telephone follow-ups. Sleep efficiency (SE), total sleep time (TST), total wake time (TWT), sleep onset latency (SOL), wake time after sleep onset (WASO), number of awakenings, and sleep quality measures were derived from sleep-wake diary entries and were averaged in 2-week intervals. For 20 participants completing the protocol, statistically significant improvements were observed in SE, TST, TWT, SOL, and WASO at end-treatment as compared with pretreatment values.

Manjunath NK, Telles S. (2005) studied Influence of Yoga and Ayurveda on self-rated sleep in a geriatric population. The objective of the study was Sleep in older persons were characterized by decreased ability to stay asleep, resulting in fragmented sleep and reduced daytime alertness. This study was designed to compare the effects of Yoga and Ayurveda on the self rated sleep in a geriatric population. They used the methodology of the 120 residents from a home for the aged, 69 were stratified based on age (five year intervals) and randomly allocated to three groups i.e., Yoga (physical postures, relaxation techniques, voluntarily regulated breathing and lectures on yoga philosophy), Ayurveda (a herbal preparation), and Wait-list control (no intervention). The groups were evaluated for self-assessment of sleep over a one week period at baseline, and after three and six months of
the respective interventions. The results of this study Yoga group showed a significant decrease in the time taken to fall asleep (approximate group average decrease: 10 min, P<0.05), an increase in the total number of hours slept (approximate group average increase: 60 min, P< 0.05) and in the feeling of being rested in the morning based on a rating scale (P<0.05) after six months. The other groups showed no significant change. They interpreted and concluded from this study Yoga practice improved different aspects of sleep in a geriatric population.

Elavsky S, McAuley E. (2007) conducted the study on Lack of perceived sleep improvement after 4-month structured exercise programs. The main objective of the study was many middle-aged women experience decreases in their sleep quality during the menopausal transition. In 164 previously low-active middle-aged women (mean age = 49.9, SD = 3.6), using a 4-month randomized, controlled trial, they examined structured exercise in the form of walking or yoga to determine the effects on perceived sleep quality. The design of the study Participants completed body composition and fitness assessments and a battery of psychological measures, including the Pittsburgh Sleep Quality Index, at the beginning and end of a 4-month randomized, controlled exercise trial with three arms: walking, yoga, and control. They found out the results were a series of mixed-model repeated-measures univariate analyses of covariance did not reveal any statistically significant intervention effects for total sleep quality or any individual sleep-quality domain. The pattern of effect sizes indicated that the walking group tended to experience small improvements in five of the seven assessed sleep-quality domains. Residual changes in menopausal symptoms and depression were associated with residual changes in total sleep quality. However, after controlling for the effects of physical activity, only menopausal symptoms contributed a unique amount of variance in residual change in total sleep quality. The conclusion of this study, 4-month moderate-intensity walking and low-intensity yoga
programs were ineffective in yielding statistically significant improvements in sleep quality. Exercise interventions of longer durations or greater intensity may be needed for such improvements.

**Chen KM, et.al. (2009).** Conducted the study of Sleep quality, depression state, and health status of older adults after silver yoga exercises. The objective of the study to test the effects of 6 months of silver yoga exercises in promoting the mental health of older adults in senior activity centers, especially their sleep quality, depression, and self-perception of health status. They used the design for the study was Cluster randomized trial. A sample of 139 participants was recruited, and 128 of them completed the study. (1) community-dwelling older adults ages 60 and over, (2) no previous training in yoga, (3) able to walk without assistance, (4) cognitively alert based on the Short Portable Mental Status Questionnaire (SPMSQ) score of eight or higher, and (5) independent or mildly dependent in self-care based on a Barthel Index (BI) score of 91 or higher. A 70-min silver yoga exercise program was implemented three times per week for 6 months as the intervention for the participants in the experimental group. The results of the study were Most of the mental health indicators of the participants in the experimental group had significantly improved after the silver yoga interventions, and many of the indicators improved after 3 months of intervention and were maintained throughout the 6 months study. The mental health indicators of the participants in the experimental group were all better than the participants in the control group (all p<.05). They concluded After 6 months of silver yoga exercises, the sleep quality, depression, and health status of older adults were all improved.

**Morgan K, et.al (2004).** Conducted the study to evaluate the clinical and cost impact of providing, in routine general practice settings, a cognitive-behaviour therapy (CBT) package for insomnia to long-term hypnotic drug users with chronic sleep
difficulties; and to identify factors associated with variations in clinical outcomes, they designed for this study a pragmatic cluster randomized controlled trial with two treatment arms (a CBT-treated 'sleep clinic' group, and a 'no additional treatment' control group), with post-treatment assessments starting at 3, 6 and 12 months in the settings of Twenty-three general practices in Sheffield, UK. The subjects of the study were In total, 209 patients (aged 31-92 years) with chronic sleep problems who had been receiving repeat hypnotic drug prescriptions for at least 1 month (mean = 13.4 years) were recruited into the trial. The main outcome measures of the study were global sleep quality [as measured by the Pittsburgh Sleep Quality Index (PSQI)], frequency of hypnotic drug use, mean dose of hypnotics consumed, health-related quality of life [as measured by the Short-Form 36 (SF-36)], NHS service costs and overall cost utility. The results of the study At 3- and 6-month follow-ups, patients treated with CBT showed improved global PSQI scores as well as improvements in the SF-36 dimensions of vitality at 3 months and physical functioning and mental health at 6 months. CBT-treated patients also reported reductions in the frequency of hypnotic drug use compared with the control group, with many CBT-treated patients reporting zero drug use at the follow-up assessments. Clinical improvements were maintained within the CBT group at the 12-month follow-up, with PSQI scores and the frequency of hypnotic drug use continuing to show significant reductions relative to the control group. Multiple regression analyses of PSQI scores within the sleep clinic group alone indicated that the magnitude of pre- to post-treatment change in overall sleep quality was closely related to Hospital Anxiety and Depression Scale depression scores at 3-, 6-and 12-month follow-ups. In each model higher depression scores at baseline were associated with poorer treatment outcomes. No significant relationship was found between the patient's age and PSQI outcomes in any of these analyses. Within the sleep clinic group, reductions in drug use showed no significant association with the hypnotic product consumed. A
simple model also showed that extending the evaluation period beyond 6 months may improve the cost-effectiveness of CBT. The incorporation of hidden costs associated with hypnotic drug treatment (e.g. accidents) also reduces the cost per QALY ratio, although to a much lesser degree. They concluded from this study psychological treatment for insomnia can improve sleep quality, reduce hypnotic drug use, and improve health-related quality of life at a favourable cost among long-term hypnotic users with chronic sleep difficulties. This study clearly indicated that older age per se presents no barrier to successful treatment outcomes.

Daubenmier, J.J. (2005) studied the relationship of yoga, body awareness, and body responsiveness to self-objectification and disordered eating. Yoga practice is associated with greater body awareness, helps chronic fatigue and treats insomnia. A study compared three groups of women who reported engaging in yoga; aerobic exercise; and neither yoga nor aerobic exercise, found that yoga practice is associated with greater body awareness, lower self-objectification, greater body satisfaction and fewer disordered eating attitudes, compared to aerobic exercise and no exercise.

M. Perlis, et al. (2000) conducted the study on Behavioral Treatment of Insomnia: A Clinical Case Series Study. There is substantial experimental evidence that behavioral treatment of insomnia produces significant clinical improvement and that treatment gains tend to be maintained over time. Less clear is whether behavioral treatment is effective as it is plied in clinical settings. In this clinical case series study, they evaluated 47 patients with primary insomnia. It was found that patients were, on average, 43% improved. This average corresponded to a 65% reduction in sleep latency, a 46% decrease in number of awakenings per night, a 48% reduction in wake time after sleep onset, and a 13% increase in total sleep
time. These results suggest that behavioral treatment for insomnia is as effective in clinical settings as it is under clinical trial conditions.

Jeanetta C. Rains (2008) studied on Optimizing circadian cycles and behavioral insomnia treatment in migraine” Sleep regulation may play a key role in headache management for individuals with migraine. At least among individuals with a predisposition to headache, episodes may be provoked by sleep deprivation or excess, as well as by sleep disorders. Chronobiological patterns have been identified in some forms of headache, including migraine. Insomnia is the most common sleep disorder in headache clinic populations, observed in half to two thirds of migraineurs. Recent evidence suggests migraine may improve with regulation of sleep. Because sleep represents a potentially modifiable vulnerability to headache, practitioners may wish to consider strategies that restore sleep homeostasis. Behavioral strategies are effective for regulation of sleep and may be abbreviated for headache medical practice settings.

Morin CM, et.al. (1994). conducted the study of Nonpharmacological interventions for insomnia: a meta-analysis of treatment efficacy. The objective of study was the role of psychological factors in insomnia, the shortcomings of hypnotic medications, and patients' greater acceptance of nonpharmacological treatments for insomnia, the authors conducted a meta-analysis to examine the efficacy and durability of psychological treatments for the clinical management of chronic insomnia. The methodology of the study were A total of 59 treatment outcome studies, involving 2,102 patients, were selected for review on the basis of the following criteria: 1) the primary target problem was sleep-onset, maintenance, or mixed insomnia, 2) the treatment was nonpharmacological, 3) the study used a group design, and 4) the outcome measures included sleep-onset latency, time awake after sleep onset, number of nighttime awakenings, or total sleep time. The results of the study were
Psychological interventions, averaging 5.0 hours of therapy time, produced reliable changes in two of the four sleep measures examined. The average effect sizes (i.e., z scores) were 0.88 for sleep latency and 0.65 for time awake after sleep onset. These results indicate that patients with insomnia were better off after treatment than 81% and 74% of untreated control subjects in terms of sleep induction and sleep maintenance, respectively. Stimulus control and sleep restriction were the most effective single therapy procedures, whereas sleep hygiene education was not effective when used alone. Clinical improvements seen at treatment completion were well maintained at follow-ups averaging 6 months in duration. The conclusions of study were the findings indicate that nonpharmacological interventions produce reliable and durable changes in the sleep patterns of patients with chronic insomnia.

2.2. STUDIES ON MOTOR FITNESS COMPONENTS

Reddy and Kumar (2001) conducted a study on yogasanas and aerobic dance and their effects on selected motor 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 analysed by ‘t’ test, analysis of co-variance and post hoc test was done with Scheffes 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.

Maity and Samanta (2001) conducted a study on the effect of calisthenics and yogasanas on motor fitness status of fifth grade girls. Pre test and post test scores of Oregon
Motor Fitness test obtained from the calisthenics group, yogasana group and control group were analysed by using ‘t’ test after 12 weeks training. It was concluded that (i) improvement of motor fitness as assessed on Oregon Motor Fitness Test after 12 weeks of treatment justified the fact that both the programmers of calisthenics and yogasana were effective in developing motor fitness of fifth grade girls. (ii) Calisthenics exercise programme was found superior to yogasanas in improving performance in each individual test item of Oregon Motor Fitness test except crossed arm – curl ups.

**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).

**Tran, Holly, Iashbrook, Amsterdam (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, cardiorespiratory
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.

The effect of yoga training on reaction time, respiratory endurance and muscular strength was investigated by Madanmohan et al. (1993). 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.

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 analysed 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 prayanama showed significant improvement in the physical and physiological fitness parameters.

Chan, et al. (2001) made a study to determine the relationship between the psychometric profile and health related fitness of Chineese youths in Hong Kong. They selected 1,615 Chineese school boys as subjects. The physical self description questionnaire
suggested by Marsh et al (1994) was used to provide psychometric profiles. Anaerobic fitness estimated from mile run, flexibility scores from sit and reach test, push up scores, curl up scores and percentage of body fat were also collected as health related fitness factors. The results indicated that health related fitness is highly related to psychometric items such as perceived sport competence, perceived activity level, perception of body fat and global physical self concept. These results indicated the promotion of psychometric self perception of youth. The fact that male adolescents have more positive physical self perception than female signify the need to reevaluate the social values concerning physical fitness and perception that were placed on youth.

Mandanmohan, et al. (2003) conducted a study on effect of yoga training on handgrip, respiratory pressures and pulmonary function, i.e. maximum expiratory pressure (MEP), maximum inspiratory pressure (MIP), forced expiratory volume (FEV), forced expiratory volume in first second (FEV1) and peak expiratory flow rate (PEFR). 20 school children in the age group of 12 to 15 years were given yoga training (asanas and pranayamas) for 6 months. 20 age and gender-matched students formed the control group. Yoga training produced statistically significant (P < 0.05) increase in HGS and HGE. MEP, MIP, FEV, FEV1 and PEFR also increased significantly (P < 0.001) after the yoga training. In contrast, the increase in these parameters in the control group was statistically insignificant. Our study shows that yoga training for 6 months improves lung function, strength of inspiratory and expiratory muscles as well as skeletal muscle strength and endurance. It is suggested that yoga be introduced at school level in order to improve physiological functions, overall health and performance of students.

Harinath et. al.(2004) had conducted the study on Effects of Hatha yoga and Omkar meditation on cardiorespiratory 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 cardiorespiratory performance and psychologic 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 psychophysiologic stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being.
2.3 STUDIES ON PHYSIOLOGICAL VARIABLES

R.K.Wallace (1992) In a study of 95 female Japanese university students, Cusumano and colleagues demonstrated comparable, significant reductions over time in blood pressure among men receiving 3 weekly training sessions in either Hatha Yoga or progressive muscle relaxation. Overall, these studies demonstrated a 4.9% to 24.2% decline in diastolic blood pressure and a 2.6% to 21.3% decline in systolic blood pressure with Yoga, with the magnitude of change varying with the study design and sample population.

Peter Lang (1997) studies from 6 countries including 24 controlled studies. Over 75% of these studies report improvement in blood pressure with yoga or yoga based interventions. In a cross sectional study of healthy mind-life men with similar lifestyle characteristics, Vyas and colleagues found those with both short-term and long-term experience in Raja Yoga meditation had reduced diastolic blood pressure compared with those who were naïve to meditation of the 36 remaining studies evaluating change in baseline blood pressure with Yoga and Yoga-based programs, only m8 studies found no evidence of improvement, including a small German study of changes in healthy young female practitioners during a single Yoga session, of the 10 uncontrolled studies, of the 12 randomized controlled trials, and of the RCTs. Of the 4 uncontrolled and nonrandomized controlled trials with negative findings, all were small studies of healthy young Indian men that demonstrated no change in blood pressure, but an improvement in heart rate and / or this indicates of cardiovascular function. 2 of the 4 studies included active Yoga asanas. RCTs yielding negative results included a 6 week study of healthy British elderly and a 3 month study of healthy Indian boys that demonstrated no impact on blood pressure, but a significant reduction in heart rate and increase in heart rate variability in participants completing a Yoga program compared with those receiving an aerobic exercise program or no intervention.
James Raub et.al. (2001) In a study of 4105 normal intensive young adults, Mathews and colleagues report that an exaggerated blood pressure response to the cold pressure test or certain standardized forms of Psychological stress predict the subsequent development of hypertension over 13 years. An increase in blood pressure is an expected physiological response, and It remains uncertain whether exaggerated response relate to the pathogenesis of the disease. Nevertheless, these results raise the possibility that this type of stress test might be used to identify individuals at risk for hypertension, providing improved opportunities for primary prevention.

Elsonbarry (2004) In contrast, 28 eligible intervention studies published between 1970 and 2004 reported a beneficial effect of Yoga and Yoga-based programs on Blood pressure change. These include 8 uncontrolled studies of healthy and hypertensive adults, all but one of which were conducted in India. Most of these studies were small, with only including 25 participants or more. Among nonrandomized controlled trials, 9 studies of healthy adults with hypertension and / or CAD have demonstrated significant reductions in blood pressure among participants who completed a Yoga-based intervention relative to controls receiving an exercise, enhanced usual care, or no intervention. Likewise, 11 RCTs of healthy adults and patients with hypertension of this CVD risk factors have demonstrated significant blood pressure declines among subjects receiving a Yoga based intervention various controls receiving usual care, enhanced usual care with diet and exercise, social contact, place therapy, or no active intervention.

Marian Garfinkel et.al. (2004) The object of the study is Yoga as a complementary therapy by broadening Yoga’s application beyond stress-related ailments to include preventative and curative therapies, physicians today have an advantage in treating patients illness and disorders. Specifically, Yoga therapy complements patient’s traditional medical treatment of osteoarthritis and of this bone and joint disorders. Following anatomical
guidelines, Yoga teachers can adapt postures (asana) to ensure patient’s organs, joints, and bones are aligned to achieve physiologic changes. Recent studies performed by this author assessing the effect of yoga therapy on rheumatic diseases, such as osteoarthritis, and repetitive strain injuries, such as carpal tunnel syndrome, showed that Yoga therapy caused physiologic changes, relieved pain and improved motion.

Krista, (2005) the object of the study is Yoga practice is associated with attenuated weight gain in healthy, middle-aged men. To examine when this Yoga practice is associated with lower mean 10-year weight gain after age 45. Participants included 15,550 adults, aged 53 to 57 years. Recruited to the Vitamin and Lifestyle (VITAL) cohort study between 2000 and 2002. Physical activity (including Yoga) during the past 10 years, diet, height, and weight at recruitment and at ages 30 and 45. All measures were based on self-reporting, and past weight at was retrospectively ascertained. Multiple regression analyses were used to examined covariate-adjusted associations between Yoga practice and weight change from age 45 to recruitment and polychotomous logistic regression was used to examine associations of Yoga practice with the relative odds of weight maintenance (within 5%) and weight loss (>5%) compared to weight gain. Yoga practice for four or more years was associated with a 3.1-IB lower weight gain among normal weight (BMI<25) participants (9.5lbs versus 12.6lbs) and an 18.5lb lower weight gain among over weight participants (5 lbs versus 13.5lbs) (both P for trend <.001). Among over weight individuals 4 + years of Yoga practice was associated with a relative odds of 1.85(95% confidence interval (CI) 0.63 – 5.42) for weight maintenance (within 5%) and 3.88(95%% CI 1.30-9.88) for weight loss (>5%) compared to weight gain (P for trend .026 and .003, respectively). Regular Yoga practice was associated with attenuated weight gain, most strongly among individuals who were overweight. Although casual inference from this observational study is not possible,
results are consistent with the hypothesis that regular Yoga practice can benefit individuals who wish to maintain or lose weight.

**Marieke Van Puymbroeck, (2006)** The object of the study is A phase I Feasibility study of Yoga on the Physical Health and Coping of Informal Caregivers family and friends who provide unpaid care to an individual with a disease or disability (known as informal caregivers) experience numerous threats to their physical health as a result of providing care. In spite of evidence that participation in physical and leisure activities can be health promoting, informal caregivers have reported diminished or completely absent leisure participation. Hatha Yoga has documented therapeutic benefits, including reduced anxiety, as well as improved muscle strength and endurance and flexibility. The purpose of this study was to determine the feasibility of conducting an 8 week Yoga program with informal caregivers, and together pilot data on the effects of Yoga on the physical fitness and coping of informal caregivers. Caregivers were randomized into a Yoga intervention (n=8) or control group (n=9). The Yoga sessions were 2.5 hours/week for 8 weeks and consisted of a variety of pranayama (breathing) and asana(postures) activities and were by a certified Yoga Instructor. Four caregivers (two in each group) dropped out of the study. After the conclusion of the 8 week Yoga program, lower body strength increased significantly for those in the Yoga group and of this notable trends occurred in terms of coping. Upper body strength and aerobic endurance. Caregivers in the control group experienced in a Yoga program may receive some benefits. Future studies are encouraged to test the efficacy of yoga as an intervention for caregivers.

**Guarracino (2006)** Yoga participation is Beneficial to Hypertension control and positive quality of life. The objective of this study was to evaluate the effects of hatha and relaxation yoga on Blood pressure, and quantity of life. Seventy healthy men and men aged 18 years or order completed a survey. A statistically significant body mass index for
Hypertension (30.0) was observed (P<001). A significant lower systolic blood pressure was detected in the 1 to 4 year Yoga participant group as compared to less than 1 year Yoga group (P<023). The mean total mood disturbance score was 5.04, indicating the survey participants scored a positive mood state. Hatha and relaxation Yoga had a statistically significant role in, Hypertension and mood.

**Madanmohan, (2008)** The object of the study was designed to test whether Yoga training for 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 30-45 yrs) 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 weeks study period. In the Yoga group, weight loss in response to Harvard step test was 64 +/- 30g after Yoga training as compared to 161 +/- 133g before the training and the difference was significant (n=15 male subject, 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 this Yoga training for a short period of six weeks can produce significant improvements in respiratory muscle strength and endurance.

**Chiriac S, et.al. (2002)** made a study on “The beneficial effect of physical training in hypertension” and reported that Hypertension is present in epidemic proportion and is associated with a markedly increased risk of developing numerous cardiovascular disorders.
All current treatment guidelines emphasise the role of nonpharmacological interventions, physical activity included, in the treatment of mild to moderate hypertension. In patients with diabetes, cardiovascular disease or with stage 2 or 3 hypertension, drug therapy should be initiated first. Dynamic exercise of moderate intensity, 50-75% VO2max, (e.g. Asanas, Kriyas and Meditation, cycling) for 50-60 minutes, 3-5 times per week, is preferable to vigorous exercise because it appears to be more effective in lowering blood pressure. In addition to reducing hypertension, physical activity improves other cardiovascular risk factors.

Makwana et.al. (1988) selected 25 normal male volunteers undergoing a ten weeks course in the practice of yoga have been studied by some parameters of ventilatory functions tests. The observations recorded at the end of ten weeks of the course have shown improved ventilatory functions in the form of lowered respiratory rate, increased forced vital capacity, FEV1, maximum breathing capacity and breath holding time, while tidal volume and %FEV1, did not reveal any significant change. Thus, a combined practice of yoga seems to be beneficial on respiratory efficiency.

Mukhopadhyaya,S. et al. (2001) Effect of yogic exercises on physical and mental health of young fellowship course trainee A study was undertaken to observe any beneficial effect of Suryanamaskar, Asanas with kriyas 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 Suryanamaskar, Asanas with kriyas 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 Suryanamaskar, Asanas with kriyas practices. Physiological parameters like heart rate, blood pressure,
oral temperature, skin temperature in resting condition, responses to maximal and submaximal exercise, body flexibility were recorded. Psychological parameters like personality, learning, arithmetic and psychomotor ability, mental well being were 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 submaximal 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 Suryanamaskar, Asanas with kriyas practices.

**Monika Mourya, et al (2009)** Breathing exercises practiced in various forms of meditations such as yoga may influence autonomic functions. This may be the basis of therapeutic benefit to hypertensive patients. Design: The study design was a randomized, prospective, controlled clinical study using three groups. Subjects: The subjects comprised 60 male and female patients aged 20-60 years with stage 1 essential hypertension. Intervention: Patients were randomly and equally divided into the control and other two intervention groups, who were advised to do 3 months of slow-breathing and fast-breathing exercises, respectively. Baseline and postintervention recording of blood pressure (BP), autonomic function tests such as standing-to-lying ratio (S/L ratio), immediate heart rate response to standing (30:15 ratio), Valsalva ratio, heart rate variation with respiration (E/I ratio), hand-grip test, and cold presser response were done in all subjects. Results: Slow breathing had a stronger effect than fast breathing. BP decreased longitudinally over a 3-month period with both interventions. S/L ratio, 30:15 ratio, E/I ratio, and BP response in
the hand grip and cold pressor test showed significant change only in patients practicing the slow-breathing exercise. Both types of breathing exercises benefit patients with hypertension. However, improvement in both the sympathetic and parasympathetic reactivity may be the mechanism that is associated in those practicing the slow-breathing exercise.

Barnes, et al (2004) studied the “Impact of meditation on resting and ambulatory blood pressure and heart rate in youth”. Researchers at the Medical College of Georgia, in Augusta, GA, investigated the effects of meditation on blood pressure and heart rate in youth. 73 middle school students were randomly assigned to either a meditation group (N = 34) or a health education control group (N = 39) group. The meditation group meditated for 10 minutes at school and after school (at home) every day for 3 months. Blood pressure and heart rate were measured pre-test and post-test (after the 3 months). Ambulatory measurements were recorded over 24-hour periods at pretest and post test every 20 minutes during self-reported normal waking hours and every 30 minutes during self-reported normal sleep hours. Students in the meditation group showed a significant decrease in resting blood pressure, daytime ambulator blood pressure after school, and daytime ambulatory heart rate after school. These findings demonstrate the potential beneficial impact of meditation on blood pressure and heart rate in the natural environment in healthy normotensive youth.

Madanmohan Udupa K., et al (2004). “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.

2.4 STUDIES ON PSYCHOLOGICAL VARIABLES

**Hismann-C (1983)** A review of the 747 identified papers that used HADS was performed most factor analyses demonstrated a two-factor solution in good accordance with the HADS subscales for Anxiety (HADS-A) and depression (HADS-D), respectively. The correlations between the two subscales varied from .40 to .74 (mean .56). Cronbach’s alpha for HADS-A varied from .68 to .93 (mean .83) and for HADS-D from .67 to .90 (mean .82). In most studies an optimal balance between sensitivity and specific was achieved when caseness was defined by a score of 8 or above on both HADS-D. The sensitivity and specific for both HADS-A and HADS-D of approximately 0.80 were very similar to the sensitivity and specific achieved by the General Health Questionnaire (GHQ). Correlations between HADS and of this commonly used questionnaires were in the range .49 to .83. CONCLUSIONS: HADS was found to perform well in assessing the symptom severity and causes of anxiety disorders and depression in both somatic, psychiatric and primary care patients and in the general population.

**Necklemann.D (2003)** The objective of this study was to test the reliability and validity of the Iranian version of the European Organization for research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (QLQ-C30). The English-Language version of the questionnaire was translated into Persian (Iranian Language), and its final form was approved by the EORTC study Group on Quality of Life before it was used in this study. The questionnaire was administrated at two time points to a consecutive sample of 168 newly diagnosed breast cancer patients, and almost all of them (99%) found the questions
easy to understand and acceptable. Crohnbach’s alpha coefficient for multi-item scales (to test reliability) ranged from 0.48 to 0.95 at base line and from 0.52 to 0.98 at follow-up administration of the questionnaire. Validity was inter-scale corrections were statistically significant in the expected direction. Known-group comparison analysis showed that all functioning and symptom scales discriminated between subgroups of patients differing in clinical status as defined by their performance status and disease stage. In general, the findings of this study indicate that the Iranian version of the EORTC QLQ –C30 is reliable and valid measure of quality of life in cancer patients and can be used in clinical trials and studies of outcome research in oncology.

Diane Morse (2003) A cross-sectional study with a structured interview. Setting Emergency department(ED) in an urban academic medical centre. Participants: adult patients and visitors. Interventions: Educational materials and community resource information. Results: 51 patients and 71 visitors (N=122) met the inclusion criteria and consented to enrollment during a 2 week study period of the participants, 71% were female and 29% were male. Sixty-five (53%) of the participants noticed the literature or cards. Ten (8%) read the materials. Seven (6%) retained a copy of the literature. Nineteen (16%) of the participants acknowledged knowing someone who could benefit from the information. Nine (7%) revealed that some of the information was new to them. Conclusions: Placing intimate partner violence resource pamphlets and cards in a medical setting is one means of educating the community and promoting violence prevention.

Michael T.Smith, (2005) In this study four meta-analytic reviews support the efficacy of pharmacotherapy and behavior therapy for the treatment of insomnia, no meta-analysis has evaluated whether these treatment modalities yield comparable outcome during acute treatment. The authors conducted a quantitative review of the literature on the
outcome of the two treatments to compare the short-term efficacy of pharmacotherapy and behavioral therapy in primary insomnia.

Chronic insomnia is highly prevalent in cancer patients. Cognitive-behavioral therapy (CBT) is considered the treatment of choice for chronic primary insomnia. However, no randomized controlled study has been conducted on its efficacy for insomnia secondary to cancer. Using a randomized controlled design, this study conducted among breast cancer survivors evaluated the effect of CBT on sleep, assessed both subjectively and objectively, and on hypnotic medication use, psychological distress, and quality of life.

Kenneth M.A.Macmahon (2004) Results of 3840 studies identified, 37 reported employment status and some measure of mental or physical impairment associated with disability. Most patients with CFS in these studies were unemployment. In 122 studies, the employment status control subjects were also available. Only depression seemed to be associated with unemployment in patients with CFS. No of this measureable impairment seemed to be consistently associated with disability or work outcomes. Only cognitive behavior therapy, rehabilitation, and exercise therapy interventions were associated with restoring the ability to work. No specific patient characteristics were identified as best predictors of positive employment outcomes. No quantitative syntheses of results were performed.

Beddoe A.E. (2008) To examine published evidence on the effectiveness of mind body interventions during pregnancy on received stress, mood and prenatal outcomes. Twelve out of 64 published intervention studies between 1980 and February 2007 of healthy, adult pregnant men met criteria for review. Studies were categorized by type of mind-body modality used. Progressive muscle relaxation was the most common intervention; Of this studies used a multimodal psycho education approach or a Yoga and
meditation intervention. The research contained methodological problems, primarily absence of a randomized control group or failure to adequately control confounding variables. Nonetheless there was modest evidence for the efficacy of mind-body modalities during pregnancy. Treatment group outcomes included higher birth weight, shorter length of labor, fewer instrument-associated births, and reduced perceived stress and anxiety. There is evidence that pregnant women have health benefits from mind-body therapies used in conjunction with conventional prenatal care. Further research is necessary to build on these studies in order to predict characteristics of subgroups that might benefit from mind-body practices and examine cost effectiveness of these interventions on prenatal outcomes.

**ALTEN.J (2006)** from a total of 82 identified studies, 20 randomized controlled trials met our criteria. The studies included 958 subjects total (397 experimentally treated, 561 controls). No serious adverse events were reported in any of the included or excluded clinical trials. Serious adverse events are reported in the medical literature, though rare. The strongest evidence for efficacy was found for epilepsy, symptoms of the premenstrual syndrome and menopausal symptoms. Benefit was also demonstrated for mood and anxiety disorders, auto immune illness, and emotional disturbance in neoplastic disease. The results support the safety and potential efficacy of meditative practices for treating certain illness, particularly in no psychotic mood and anxiety disorders. Clear and reproducible evidence supporting efficacy from large, methodologically sound studies is lacking.

**Utupa.K.N. (1971)** Eligible studies investigating the influence of yoga on measures of oxidative stress, including 2 uncontrolled clinical trials, 2 nonrandomized controlled clinical trials, and one RTC. All but one of these studies was conducted in India, and all provide evidence that Yoga may reduce oxidative stress in both healthy populations and those with chronic IRS-related disorders. In uncontrolled studies of Indian adults with uncomplicated diabetes mellitus, or hypertension, investigators demonstrated significant
reductions in malonyldialdehyde (MDA), a circulating product of lipid per oxidation, following a 40-day yoga training course and a 12-week Yoga lifestyle intervention, respectively. In agreement with these findings, nonrandomized controlled trials have shown significant reductions in MDA and of this markers of oxidative stress in healthy young men completing a 10-week to 5-month Yoga training program relative to matched untrained controls. Observed changes in of this oxidative Stress indicates includes increases in antioxidants and ant oxidative enzymes, and reductions in free radicals. Offering further support for a direct effect of Yoga on oxidative stress. Sharma et al. documented significant improvement in several of these indicates among trained participants during a single Yoga session when compared with controls during rest. Similarly, in RCT of 44 Thai patients with CAD, Jatuporn et al. found those receiving a 4 month Yoga-based lifestyle modification program but no medication showed significant increases in blood antioxidants relative to usual care controls, although MDA levels did not differ between groups.

**Wanger.M.A. (1972)** 7 Studies reviewed above offer support for a possible beneficial influence of Yoga oxidative stress and coagulation profiles, at least in certain populations. Limitations of these studies include lack of appropriate comparison groups, small sample sizes, possible selection bias or uncontrolled confounding by lifestyle and of this factors, lack of randomization, inadequate information regarding the study population, subject selection, intervention, or analytic methods, multiple interventions, and problems with data analysis or presentation. In addition blinding of outcome assessment was not well-reported from primarily sympathetic to parasympathetic. Key changes, reviewed briefly below, include significant reductions in respiratory and heart rate, in cortical concentrations, catecholamine levels, and remain activity, in skin conductance, and in cardiovascular response to stress, as well as significant increases in heart rate variability and bar reflex sensitivity.
Raub, J.A. (2002) numerous studies have investigated the effects of Yoga on markers of sympathetic/parasympathetic activation and cardiovascular function. The search identified a total of 42 studies from 6 countries, including 2 cross-sectional studies, 15 uncontrolled clinical trials, 16 nonrandomized controlled trials, and 9 RCTs. Although some studies have yielded inconsistent results, over 85% offer some evidence that Yoga promotes a reduction in sympathetic activation, enhancement of cardiovascular function, and a shift autonomic nervous system balance.

Roney – Dousal (1999) 27 Studies investigating the effect of Yoga on heart and/or respiratory rate, only 2 studies showed no change in either index, including a nonrandomized controlled study of 10 young athletes and an RCT of healthy young men. However, both of these latter studies demonstrated improvement in of this indicates of cardiovascular function. In contrast, 25 eligible intervention studies reported a beneficial effect of Yoga and Yoga-based programs on base line heart rate, and/or heart rate after exercise. Seven studies (of 8 totals) have documented a 3.8% to 60.3% reduction in respiratory rate with Yoga relative to baseline and/or controls receiving usual care or an aerobic exercise program (Table 5). These investigations include studies in healthy adults and children, as well as in hypertensive adults. Similarly, 21 of 24 total clinical trials reported a 4.3% to 38.8% decline in heart rate relative to baseline, engagement in a relaxing, non yogic activity and/or controls receiving usual care, an aerobic exercise program or no controls receiving usual care, an aerobic exercise program, or no intervention. These trials included studies of healthy and hypertensive adults and of healthy children.

Malathi (2001) in a cross-sectional study of healthy middle-aged men, Vyas and colleagues found those who had been practicing Yoga meditation for 5 years or more to have significant lower baseline heart rates than those who with no meditation experience.
Of those clinical trial demonstrating positive effects, Yoga practice was associated with a 3.8% to 60.3% reduction respiratory rate and a 4.3% to 38.8% decline in heart rate.

**Vasudevan, A., et al (1994)** examined the effects of Yogic meditation in tension headache and anger. 7 Ss with tension headache and high state and trait anger levels were taught and underwent 30 sessions of yogic meditation. Single group design with multiple assessment was used; pre, mid, and post assessments were made using psycho physiological measures. Results indicate no statistically significant reduction in the frontalis muscle tension and skin conductance, although clinically there was a decline. Statistically significant reduction in pain perception was observed. Yogic meditation was effective in reducing tension headache and in the state and trait anger levels.

**Panjwani, U., et al C.(1995)** studied the Effect of Sahaja yoga practice on stress management and self confidence in patients of epilepsy. The study was carried out on 32 patients of epilepsy who were randomly divided into 3 groups: group I subjects practised Sahaja yoga meditation for 6 months, group II subjects practised postural exercises mimicking Sahaja yoga and group III served as the epileptic control group. Galvanic skin resistance (GSR), blood lactate and urinary vinyl mandelic acid (U-VMA) were recorded at 0, 3 and 6 months. There were significant changes at 3 & 6 months as compared to 0 month values in GSR, blood lactate and U-VMA levels in group I subjects, but not in group II and group III subjects. The results indicate that reduction in stress following Sahaja yoga practice is responsible for clinical improvement.

**DiBenedetto M, et al (2000)** examined if a tailored yoga program could improve age-related changes in hip extension, stride length, and associated indices of gait function in healthy elders, changes that have been linked to increased risk for falls, dependency, and mortality in geriatric populations. A 3-dimensional quantitative gait evaluation, including
kinetic measurements, was performed pre- and post intervention. Twenty-three healthy adults (age range, 62-83 y) who were nature to yoga were recruited; 19 participants completed the program. An 8-week Iyengar Hatha yoga program specifically tailored to elderly persons and designed to improve lower-body strength and flexibility. Participants attended two 90-minute yoga classes per week, and were asked to complete at least 20 minutes of directed home practice on alternate days. Findings of this exploratory study suggest that yoga practice may improve hip extension, increase stride length, and decrease anterior pelvic tilt in healthy elders, and that yoga programs tailored to elderly adults may offer a cost-effective means of preventing or reducing age-related changes in these indices of gait function.

2.5 SUMMARY OF REVIEW OF RELATED LITERATURE

The investigator has complied and reviewed all the literature and professional reviews related to suryanamaskar asanas with kriyas and meditation on motor fitness components, physiological and psychological variables and from the library of TNPESU and the material available on the internet to provide sufficient knowledge to the readers and comparative analysis of the present study.

The reviews show that there is significant positive impact of suryanamaskar asanas with kriyas and meditation on Motor fitness components, physiological and psychological variables the investigator has found very less studies made on comparative analysis with suryanamaskar asanas with kriyas and meditation. Based on the experience gained the investigator formulated suitable methodology to be applied in this research that is presented in chapter III.