Chapter II
Review of Related Literature

The researcher has tried to present the effects of different types of training intervention on fine abilities for better performance in daily activities. To get a clear cut idea of selecting customized program on functional fitness of secondary school teacher, ample literature has been reviewed in this chapter. The researcher has taken support of reviews on other training interventions that helped to improve functional fitness of female population. The detailed review has been classified as follows. Review of related literature has been presented in following major areas.

Women health and Yoga related studies
Working women (teacher) and health issues
Working women as teacher
Yoga and fitness related studies
SuryaNamaskar
Assistive yoga
Breathing power
Functional fitness

2.1 Women Health and Yoga Related Studies

Women have proven their mettle in every field and in every sphere. The modern Indian woman might be overly worried about the health of her child and the well being of her family but she is among the most neglected about herself. Their personal, physical and psychological problems at different ages are varied like premenopausal postmenopausal, climacteric symptoms, osteoporosis, breast cancer, depression, stress, hypo-kinetic diseases. Much research had done on women’s physical problems, the area she neglects the most.

Sirola & Rikkonen (2005) illustrated physical problems of women which are very common in women, a milestone in female health and after passing through menopause, women experience increased musculoskeletal and cardiovascular morbidity. Muscle performance is an important determinant of functional capacity and quality of life among the elderly and is also involved in the maintenance of balance. Therefore, good muscle strength can prevent fragility fractures and lessen the
burden of osteoporosis. Muscle strength begins to decline during the premenopausal years and this phenomenon seems to be partly estrogen dependent. Randomized controlled trials indicated that hormone replacement therapy may prevent a decline in muscle performance, although the exact mechanism of estrogen-dependent sarcopenia remains to be clarified. Exercises have been shown to improve postmenopausal muscle performance and hormone replacement therapy may also potentiate these beneficial effects that of improvement of muscle strength alone, Work history and educational background may be associated with postmenopausal muscle performance, which itself has unique associations with skeletal and cardiovascular diseases, morphologic and physiologic changes that naturally predispose older adults too.

A pilot study of a Hath yoga treatment for menopausal symptoms by LaForce, C.B., Thurston, R.C., & Taylor, M. R.(2007) assessed the feasibility and efficacy of yoga treatment for menopausal symptoms. Both physiologic and self-reported measures of hot flashes were included. A prospective within-group pilot study was conducted. Participants were 12 pre and Post-menopausal women experiencing at least 4 menopausal hot flashes per day, at least 4 days per week. Assessments were administered before and after completion of a 10-week yoga program. Pre- and post-treatment measures included: Severity of questionnaire-rated menopausal symptoms (Wiklund Symptom Check List), frequency, duration, and severity of hot flashes (24-h ambulatory skin-conductance monitoring; hot-flash diary), interference of hot flashes with daily life (Hot Flash Related Daily Interference Scale), and subjective sleep quality (Pittsburgh Sleep Quality Index). Yoga classes included breathing techniques, postures, and relaxation poses designed specifically for menopausal symptoms. Participants were asked to practice at home 15 min each day in addition to weekly classes. Eleven women completed the study and attended a mean of 7.45 (S.D. 1.63) classes. Significant pre to post treatment improvements were found for severity of questionnaire-rated total menopausal symptoms, hot-flash daily interference; and sleep efficiency, disturbances, and quality. Neither 24-hr. monitoring nor accompanying diaries yielded significant changes in hot flashes. The yoga treatment and study procedures were feasible for midlife women. Improvement in symptom perceptions and well being warrant further study of yoga for menopausal symptoms, with a larger number of women and including a control group.

Adkins, M.A. (2011) noted a Cross-sectional study which investigated bone mineral density (BMD), balance, and strength in postmenopausal women participating in
regular Hatha Yoga practice. Thirteen healthy postmenopausal women (age 64.0 ± 5.0 years) practicing Hatha Yoga two or more hours per week for a minimum of three years were compared with thirteen age-matched, sedentary postmenopausal women. The main outcome measurements were body composition, leg strength, balance capabilities, and BMD of the lumbar spine, left and right hip, whole body, and no dominant forearm. Significant differences between groups were found in body mass (BM) percent, android fat percent, and lean mass percent. After controlling for body mass, no significant differences were found in BMD at any site. No significant differences were observed for balance or strength measurements between groups. Based upon the results of this study, it does not appear that yoga has any significant effects on BMD. A longitudinal study regarding this subject that includes a controlled form of yoga activity is needed to determine the true effects of yoga on BMD, balance, and strength in postmenopausal women.

Treating the climacteric symptoms in Indian women with an integrated approach to yoga therapy: a randomized control study predicted by Chattha, R., Raghuram, N., Venkatram, P., and Hongasandra, N. R. (2008). They observe the effect of yoga on the climacteric symptoms, perceived stress, and personality in premenopausal women. One hundred twenty participants (age’s 40-55 yr.) were randomly divided into two study arms, i.e., yoga and control. The yoga group practiced an integrated approach to yoga therapy comprising SuryaNamaskara (sun salutation) with 12 postures, Pranayama (breathing practices), and avartan dhyan (cyclic meditation), the control group practiced a set of simple physical exercises under supervision of trained teachers for 8 weeks (1 h daily, 5 days per week). The assessments were made by Greene Climacteric Scale, Perceived Stress Scale, and Eysenck's Personality Inventory before and after the intervention. Of the three factors of the Greene Climacteric Scale, the Mann-Whitney test showed a significant difference between groups (P < 0.05) in the vasomotor symptoms, a marginally significant difference (P = 0.06) in psychological factors but not in the somatic component. Effect sizes were higher in the yoga group for all factors. There was a significantly greater degree of decrease in Perceived Stress Scale scores (P < 0.001, independent samples t test) in the yoga group compared with controls (between-group analysis) with a higher effect size in the yoga group (1.10) than the control (0.27). On the Eysenck's Personality Inventory, the decrease in neuroticism was greater (P < 0.05) in the yoga group (effect size = 0.43) than the control group (effect size = 0.21) with no change in extroversion
in either the yoga or control group. It was concluded that, eight weeks of an integrated approach to yoga therapy decreases climacteric symptoms, perceived stress, and neuroticism in premenopausal women better than physical exercise.

To describe the effect of a supervised physical activity program on the physical and psychological health of osteopenic women, Bravo, G., Gauthier, P., Roy, P. M., Payette, H., Gaulin, P., Harvey, M., Péloquin, L., & Dubois, M. F. (1996) designed a randomized controlled trial on Sherbrooke, Quebec, Canada. A total of 124 community-living postmenopausal women, between 50 and 70 years of age, with low bone mass took part in the study. Intervention was Subjects allocated to the experimental group performed weight-bearing exercises (walking, stepping up and down from benches), aerobic dancing, and flexibility exercises for 60 minutes, three times a week, over a period of 12 months. All subjects were invited to attend bi-monthly educational seminars covering topics related to osteoporosis. Outcome measures was Spinal and femoral bone mineral density (BMD), functional fitness (flexibility, coordination, agility, strength/endurance, cardio respiratory endurance), psychological well-being, back pain intensity, and self-perceived health. Results was Spinal BMD stabilized in the exercisers while decreasing significantly in the controls (P = .031). No change in femoral BMD was observed in either group (P = .597). Four of the five parameters chosen to evaluate functional fitness, namely flexibility, agility, strength, and endurance, were affected positively by the exercise program (all P < .01). Adjusting for pre scores by means of an analysis of covariance revealed a significant difference between the groups in psychological well-being, which favored the exercisers (P = .012). After 12 months, back pain reported by exercisers was lower than that reported by controls (P = .008). Self-perceived health increased in the exercise group, whereas no difference was observed in the control group (P = .790). These results suggest that after 12 months, exercising can produce a significant increase above initial levels in the functional fitness, well-being, and self-perceived health of osteopenic women. Intensity of back pain can also be lowered by exercise.

Blank, S. E., Kittel, J., & Haberman, M. R. (2008), speculated the Iyengar system of Yoga is well suited to meet the guidelines for physical activity for breast cancer survivors. Attention to alignment and symmetry, the use of props, and careful sequencing all improve stamina, strength, flexibility, and confidence, while decreasing stress and side effects. Women (n = 18, ages 48 to 69 years) diagnosed with stage I–III breast cancer and receiving antiestrogen or aromatase inhibitor
hormonal therapy were recruited for this study. The range of time since chemotherapy and/or radiation treatment was three months to eight years. The subjects were randomized to either a Yoga (n = 9) or wait-list control group. Beginning level Iyengar Yoga classes were conducted two times per week for eight weeks. The women were given a home instruction sheet to practice once a week at home for a total of three Yoga sessions per week. A 92.9% ± 9.8% (mean ± SD) compliance rate for weekly home practice was achieved. During the sixth week of classes, the subjects were asked to complete a 31-question self-report survey that focused on their feelings of stress, level of physical and mental effort during class sessions, and perceptions about how Yoga practice had influenced their awareness. The preliminary findings indicate that the Yoga class was well tolerated by the participants. 75% of the women reported that they would not prefer a slower paced class with less demanding poses. Yoga practice relieved the joint aches and shoulder stiffness associated with the side effects of hormonal treatment for 25% of the participants. Over 60% of the women reported improved mood and less anxiety as an outcome of the Yoga practice.

Harner, Hanlon, A.L., & Garfinkel, M. (2009) observed (a) to address the feasibility of providing a gender-responsive exercise intervention within a correctional institution and (b) effect of a group-format Iyengar yoga program that met two sessions a week for 12 weeks on levels of depression symptoms, anxiety symptoms, and perceived stress among incarcerated women. A repeated measures design, in which each participant served as her own control, was used. Participants completed three self-administered instruments: the Beck Depression Inventory, the Beck Anxiety Inventory, and the Perceived Stress Scale before treatment (baseline) and during treatment (Weeks 4, 8, and 12). Linear mixed effects models were used to examine statistically significant changes in mental health measures over time, taking advantage of all available data. Although 21 women initially participated in the intervention, 6 women completed the 12-week intervention. A significant linear decrease was demonstrated in symptoms of depression over time, with mean values changing from 24.90 at baseline to 5.67 at Week 12. There was a marginally significant decrease in anxiety over time (12.00 at baseline to 7.33 at Week 12) and a nonlinear change in stress over time, with decreases from baseline to Week 4 and subsequent increases to Week 12. Women participated in this program experienced fewer symptoms of depression and anxiety over time.
Asikainen, T.M., Suni, J.H., M.E. Pasanen, P. Oja, & M.B. Rinne, (2006), experimented on subjects, 134 women who recently went through menopause. The study was a 15-week, randomized, controlled trial with continuous and fractionated exercise groups. The outcomes assessed were lower-extremity muscle strength, balance, and walking time over 2 km. Feasibility was assessed by questionnaires, interviews, and training logs. One hundred twenty-eight women completed the study. Adherence to the study protocol was 92%. Both continuous and fractionated exercise groups improved equally in lower-extremity muscle strength and walking time but not in balance. Almost 70% of the subjects considered the program to be feasible. The study concluded that two daily walking sessions caused fewer lower-extremity problems than did continuous walking. Brisk walking combined with moderate resistance training is feasible and effective. Fractionating the walking into 2 daily sessions is more feasible than continuous walking.

Evaluating the effectiveness of a ten-week, yoga-based, home exercise program on the flexibility of older women. Jeffrey, W., & Scott, J.M. (2003) experimented on thirty females. Age; height, weight were taken, participated Subjects performed tests to assess trunk flexion (TF), trunk extension (TE), shoulder flexion (SF), and right and left ankle flexibility (RANKLE and ANKLE). Subjects were matched according to age and activity level and randomly assigned to one of two groups. The exercise group trained for 30 min/d, four d/wk, using a video for instruction. The non-exercise group acted as the control. Statistical analysis using doubly MANOVA repeated measures (α ≤ 0.05) revealed significant effects for time and group by time for REACH, TE, SF, LANKLE, and RANKLE combined (p ≤ 0.001). Flexibility increased in the treatment group and decreased in the control group. Using ANOVA, only TE differed significantly over time (p < .001). Group by time effects were significant for all dependent variables (p ≤ 0.014). Concluded that home-based yoga exercise may be beneficial for older women.

Summary

As seen in the reviews given above, it has been proved that Yoga helps to tackle women’s health issues. It was found that women who participated in a 12 week program experienced fewer symptoms of depression and anxiety over time (Harner, et al., 2009). Women reported improved mood and less anxiety as an outcome of the Yoga practice. (Blank, E.S., et al., 2008)). Further, Yoga activity is needed to determine the true effects of yoga on BMD, balance, and strength in postmenopausal
women. (Adkins, M. A., 2011)). Literature also suggests that the Iyengar system of Yoga is well suited to meet the guidelines for physical activity of women. (Sally E. Blank, et al. 2008).

2.1.1 Working Women Profession (Teacher) and Health Issues.
Women have other responsibilities along with daily household chores, maintaining their family, children, spouse, as well as their personal and professional life is not an easy task. To understand working women profession and health issues. Cheema, B., Paul, W.M., Chang, D., Colagiuri, B., & Bianca, A. (2011) analyzed 10-week; worksite-based yoga program, which delivered during lunch hour, can improve resting HRV and related physical and psychological parameters in sedentary office workers. This was a parallel-arm RCT that would compare the outcomes of participants assigned to the experimental treatment group (yoga) to those assigned to a no treatment to control group. Participants randomized to the experimental condition would engage in a 10-week yoga program delivered at their place of work. The yoga sessions would be group-based, prescribed three times per week during lunch hour, and were led by an experienced yoga instructor. The program would involved teaching beginner students safely and progressively over 10 weeks a yoga sequence that incorporates asanas (poses and postures), vinyasa (exercises), pranayama (breathing control) and meditation. The primary outcome of this study was the high frequency (HF) spectral power component of HRV (measured in absolute units; i.e. ms2), a measure of parasympathetic autonomic control. Secondary outcomes included additional frequency and time domains of HRV, and measured physical functioning and psychological health status. Measures were collected prior to and following the intervention period, and at 6 months follow-up to determine the effect of intervention withdrawal. Implementing practical interventions, such as yoga, into the workplace to mitigate stress, enhance health status and reduce the risk of cardiovascular and metabolic diseases. For chronic work-related stress which is a significant and independent risk factor for cardiovascular and metabolic diseases and associated mortality, particularly when compounded by a sedentary work environment, a way out could be a worksite yoga program.

Maintaining their other responsibilities along with personal and professional life as a teacher is not an easy task. Specially, in a metropolitan city, people are always tied up in heavy schedules having busy lifestyles. Teachers too have a hectic life, reaching
school on time after traveling long distances, performing various responsibilities both at home and at school. This indeed leaves them with practically no time for themselves. Fitness has the least priority in teachers, as especially secondary teacher profession chosen by women. They are most neglected by themselves for various reasons. Financial constraints lack of motivation and their very busy schedule leave them very unfit. Since, each of one has different needs due to the structure of their bodies and their personal history of how they use their body.

To comprehend professional life as a teacher especially for women Freude, G., Seibt, R., Pech, E., & Ullsperger, P. (2005) analyzed the work ability and vitality of teachers of different age groups (group 1: < 45 years, group 2: ≥ 45 years) working at comprehensive secondary schools. 100 female teachers were included in this analysis. A multidisciplinary approach was applied, including life style analysis, work anamnesis, work ability index, scores of the effort–reward-imbalance (ERI) and of the relaxation inability (RI), burnout risks analysis (Maslach Burnout Inventory) as well as different physical, mental and social parameters of the participants, which were analyzed by a so called measuring station of vitality. It was shown that already 24% of teachers of the younger age group and 49% of the elderly teachers show a poor/moderate work ability, which indicates an urgent need for measures for improving work ability. More than 50% of teachers suffer from psychic (exhaustion, fatigue, memory and concentration problems) and muscular–skeletal disorders. Factors positively influencing work ability are a low number of physical and psychological complaints, an appropriate relation between effort and reward at work and a low burnout risk. Factors which could be identified to be related to low work ability are a high number of health complaints, a low level of physical fitness and an inappropriate waist–hip ratio. The study concluded that measures for preventing a decline of work ability of teachers with increasing age should focus on identifying the reasons for health complaints, on measures which focus on effort and reward at work and on a healthy life style (avoiding individual health risk factors).

Actions for promoting work ability of teachers were an important objective for preventing teachers from early retirement. It was possible to develop generic routines that would benefit everyone; it was also possible to customize exercise routines in ways that it could help the specific needs of each individual; yoga can make teaching practice easy. Effect of pranayama on stress and job satisfaction of teachers, experimented by Dureha, D. K., Singh, M. & Mishra, P. (2010). To find the effect
of pranayama on mental stress and job satisfaction of teachers from Banaras Hindu University. Thirty teachers were selected for the study; The t test was applied to find out the effect of effect of 12 week training of pranayama on mental stress and job satisfaction of teachers from Banaras Hindu University. For testing the difference between the mean gain of initial test and final test the level of significance was set at 0.05 level of confidence. The study concluded that the pranayama practice among teachers was significantly improved from the 12 week training of pranayama on mental stress and job satisfaction of teachers from Banaras Hindu University.

Teacher stress has been the focus of educational concern. It has been researched, for decades, and it has resulted in the development of several teacher stress scales and various strategies to address the negative effects of stress and burnout, which Anderson, V. L. (1999) pointed out with promising results in reducing teacher stress had come from the practice of standardized meditation (SM). The current study employed a pretest–posttest control group design and used the Teacher's Stress Inventory, State–Trait Anxiety Inventory, and the Maslach Burnout Inventory to assess the effect of a 5-week standardized meditation class on the perceived occupational stress of 91 full-time elementary, middle, and high school teachers (aged 22–60 yrs) from suburban districts in three states. Results were consistent with previous studies and offered support for the hypothesis that SM significantly reduces teachers' perceived stress. Teachers perceived a reduction in stress using SM only 2–5 times per week.

Riordan, M. T. (2010) agrees that the art of yoga was used as support in the development of teaching practices. Preparing Pre-service teachers to enter a field filled with uncertainty, frustration, and negative stress. The expectations are high, the compensation is minimal, and the job has immeasurable importance in terms of its contribution to the future of the world. For some teachers, the natural progression of working under such conditions results in patterns of negative thought processes, complaining, lack of enjoyment in both teaching and life, and eventual burnout. By entering this profession, the pre-service teacher is knowingly placing herself into a highly stressful environment. This stress cannot always be avoided or controlled. What can be controlled is the way the teacher experiences this stress. The focus of this master’s project was to develop a teaching practice that is balanced and sustainable in the face of a highly stressful teaching environment. The art of yoga was used as support in the development of this teaching practice. Practicing yoga promotes
physical, mental, and spiritual balance. While deepening a yoga practice through daily yoga postures and meditation, a teaching practice was simultaneously being developed through student teaching experiences. Scholarly literature about theories and practices in arts education, teacher stress and burnout, and yoga were explored. A journal was used for reflection upon the process of simultaneously developing a teaching and yoga practice. After developing her teaching and yoga practices, and reflecting on the process, the pre-service teacher was able to enter the field of teaching with the intention of maintaining balance and the tools needed to do so. The presumed result is a lifetime of teaching that is sustainable, enjoyable, and energizing. Working women, as a teacher have much pressure in their life; she has to take so many responsibilities which cause personal as well as psychological problems. To overcome related problems coupling with asanas and, meditation is a viable solution recommended by literature review. Focusing on the review, Riordan, M. T. (2010) speculates, the art of yoga was used as support in the development of this teaching practice preparing, deepening a yoga practice through daily yoga postures and meditation, a teaching practice was simultaneously being developed through student teaching experiences. Assessing promising results in reducing teacher stress come from the practice of standardized meditation. (Anderson, V. L., 1999). Pranayama practice among teachers significantly improved mental stress and job satisfaction of teachers. (Dureha, D. K. et al. 2010).

**Summary**

An overview of the above literature review brings to light that for teachers to improve work ability, to reduce health complaints, on mental stress and lead a healthy lifestyle, Yoga, and Pranayama have proved to be beneficial.

### 2.2 Yoga and Fitness Related Studies

Yoga is an ancient art based on an extremely subtle science, that of body psyche and soul. Art of yoga is useful to improve all kind of fitness level as well component. Know better about yoga and fitness literature review, Bal, B. S., Kaur, P. J. (2009) speculates the effects of selected asanas in hatha yoga on agility and flexibility level. The subjects for the study were selected on the basis of random group design. Thirty (N=30) male students were selected as subject for the present study from D.A.V. Institute of Engineering and Technology, Jalandhar (Punjab), India. All the subjects ranged between the chronological age of 18-25 years. The selected subjects were
further divided into two groups. Experimental treatment was then assigned to group “A” while group “B” acted as control. “Hexagonal Obstacle Test” was used to measure Agility whereas “Sit and Reach Test” was used to measure Flexibility. The subjects were subjected to the six week yogasanas training program that includes Swastikasana, Mayurasana, Matsyendrasana, Paschimottanasana and Gomukhasana. The difference in the mean of each group for selected variable was tested for the significance of difference by “t” test. The level of significance was set at 0.05. The results have shown the significant improvement in flexibility, since \( t = 8.122 \) > tab \( t .05 \) (14) (= 2.145). The treatment of six week yogasanas training program also showed significant improvement in case of agility, since cal. \( t = 7.376 \) > tab \( t .05 \) (14) (= 2.145). An effect of selected asanas in hatha yoga on agility and flexibility level was shown to be positive.

A longer duration of treatment could show the effect, Chaya, M. S. & Nagendra, H. R. (2006) assessed the effect of yoga training on diurnal metabolic rates in yoga practitioners at two different times of the day (at 6 a.m. and 9 p.m.). i.e. Long-term effect of yogic practices on diurnal metabolic rates of healthy subjects. Eighty eight healthy volunteers were selected and their metabolic rates assessed at 6 a.m. and 9 p.m. using an indirect calorimeter at a yoga school in Bangalore, India. The results showed that the average metabolic rate of the yoga group was 12% lower than that of the non-yoga group (P < 0.001) measured at 9 p.m. and 16% lower at 6 a.m. (P < 0.001). The 9 p.m. metabolic rates of the yoga group were almost equal to their predicted basal metabolic rates (BMRs) whereas the metabolic rate was significantly higher than the predicted BMR for the non-yoga group. The 6 a.m. metabolic rate was comparable to their predicted BMR in the non-yoga group whereas it was much lower in the yoga group (P < 0.001). The lower metabolic rates in the yoga group at 6 a.m. and 9 p.m. may be due to coping strategies for day-to-day stress, decreased sympathetic nervous system activity and probably, a stable autonomic nervous system response (to different stressors) achieved due to training in yoga.

Short term intensive yoga program can improve Low Back Pain, predicted by Tekur, P., Singphow, C., Nagendra, H. R., & Raghuram, N. (2008) the effect of a short-term intensive residential yoga program with physical exercise (control) on pain and spinal flexibility in subjects with chronic low-back pain (CLBP). This was randomized controlled study. The study was conducted at a residential integrative health center in Bangalore, South India. Eighty (80) subjects (females, n = 37) with CLBP, The
intervention consisted of a 1-week intensive residential yoga program which comprised of asanas (physical postures) designed for back pain, pranayamas (breathing practices), meditation, and didactic and interactive sessions on philosophical concepts of yoga. The control group practiced physical exercises under a trained physiatrist and also had didactic and interactive sessions on lifestyle change. Both the groups were matched for time on intervention and attention. Pain-related outcomes were assessed by the Oswestry Disability Index (ODI) and by spinal flexibility, which was assessed using goniometer at pre and post intervention. Data were analyzed using repeated measures analysis of variance (RMANOVA). There was a significant reduction in ODI scores in the yoga group compared to the control group. Spinal flexibility measures improved significantly in both groups but the yoga group had greater improvement as compared to controls on spinal flexion. Seven (7) days of a residential intensive yoga-based lifestyle program reduced pain-related disability and improved spinal flexibility in patients with CLBP better than a physical exercise regimen. Longer and shorter duration of yoga treatment could result in more significant improvements.

Birdee, G.S., Anna, T., Legedza, R. B., Saper, S., Bertisch, M., Eisenberg, D. M., & Phillips, R. S. (2008) characterized yoga users, medical reasons for use, perceptions of helpfulness, and disclosure of use to medical professionals. Utilizing cross-sectional survey data from the 2002 National Health Interview Survey (NHIS) Alternative Medicine Supplement (n = 31044), examined correlates of yoga use for health. The estimated prevalence from 2002 NHIS of yoga for health was 5.1% corresponding to over 10 million adults. In 2002, yoga users were predominantly Caucasian (85%) and female (76%) with a mean age of 39.5 years. Compared to non-yoga users, yoga users were more likely female. Yoga was most commonly used to treat musculoskeletal or mental health conditions, and most users reported yoga to be helpful for these conditions. A majority of yoga users (61%) felt yoga was important in maintaining health, though only 25% disclosed yoga practice to their medical professionals. We found that yoga users are more likely to be white, female, young and college educated. Yoga users reported benefit for musculoskeletal conditions and mental health, indicating that further research on the efficacy of yoga for the treatment and/or prevention of these conditions is warranted.

Ross, A. & Sue, T. (2010), provided 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. 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. In the studies reviewed, yoga interventions appeared to be equal or superior to exercise in nearly every outcome measured except those involving physical fitness. Particularly the two modalities may differ in their effects on the axis. Additional studies using rigorous methodologies are needed to examine the health benefits of the various types of yoga. Longer and shorter duration of yoga treatment could result in more significant improvements.

**Summary**

A longer duration of yoga training on metabolic rates in yoga practitioners at two different times of the day has shown positive effect. (Chaya, M.S. & Nagendra, H.R.2006) found that short term intensive yoga program reduces pain-related disability and improves spinal flexibility in patients with CLBP better than a physical exercise regimen (Tekur, P., et al, 2008). The studies comparing the effects of yoga and exercise seem to indicate that, in both, yoga may be as effective as or better than exercise at improving a variety of health-related outcome measures.(Ross, A. & Sue, T.,2010). Utilizing cross-sectional survey data from the 2002 National Health Interview Survey, examined correlates use of yoga for health. Yoga practitioners were more likely female and Yoga was most commonly used to treat musculoskeletal or mental health conditions, and most practitioners reported yoga to be helpful for these conditions. (Birdee, G.S.et al. 2008).

The review of the research on the effect of yoga on improving, agility, flexibility, metabolic rate, low back pain, spinal flexibility has confirmed its efficacy and substantiated the fact that it definitely improves, health and health outcomes, further a significant improvement is seen even in short duration treatments.

2.3 SuryaNamaskar

SuryaNamaskar is a complete body-mind workout. SuryaNamaskar promotes strength of mind and positive thinking, which encourages uplifting thoughts in practitioners and induces a mental awareness which helps connect them to God and the divinity within. The mental benefits of Sun Salutation are similar with meditation. Sun Salutation as meditation in movement. Sun Salutation helps to Increase mental focus and concentration. Reduce depression, anxiety and stress by reducing key markers.
Increase the quantity of “good mood” neurotransmitters. Scientific relevance of SuryaNamaskar is ‘Core Stability’ or the strengthening of the back muscles around the spine. The various yoga posture of SuryaNamaskar along with the Pranayam practices achieves this effect more easily and effortlessly. In addition to that, one can get a more balanced frame of mind and sense of wellbeing due to sun salutation. An article concurred by Tiwari, O.P. 2000.

Another article on SuryaNamaskar: A Way to Healthy Life, by Singh, A.S. (2010) conceded the physiological system of the body to benefit, the systems must function well enough to support the specific activity that the individual is performing. More over different activities make different demands upon the organism with respect to circulatory, metabolic, neurological and temperature regulatory functions. Most of the people are turning towards Yoga to get rid of physical problems and SuryaNamaskar or Sun Salutation is a simple, asana that provides immense health benefits. SuryaNamaskar is a sequence of yogic postures along with chants that together comprise a complete yoga called SuryaNamaskar (Sun Salutation). SuryaNamaskar a system of worshipping Surya has been practiced in India for thousands of years. It is a combination of twelve poses in the series with graceful movement. On each step one can count five seconds for each step of the SuryaNamaskar. It means that one SuryaNamaskar goes for one minute (and a bit more). The only change during the second set is to exchange leg with the one involved in movement during the first set. SuryaNamaskar, if performed in a systematic and precise manner, does not cause any strain or injury in the body that is why it is the safest practice. One can experience health benefits by practicing the Sun Salutation just once daily. When practiced in the morning, SuryaNamaskar relieves a person from stiffness in body it energizes the whole body and refreshes the mind. It is a physical exercise in which about 90% to 95% of one’s muscles were stretched and activated. In all this SuryaNamaskar is an appreciated exercise among people of all ages from kids to old age people. SuryaNamaskar or Sun Salutation is the best way to burn the calories and reduce weight. It is often recommended for obesity.

People are realizing the need to be fit, both for health reasons and to enhance their physical appearance. There are different methods and different theories on what works best and a look at experimented literature would provide that input. Effect of SuryaNamaskar practice on the body composition of female students pointed out by Shukla, S. (2010). Intended to analyze the effect of SuryaNamaskar practice on the
body composition of female students on randomly selected 30 female students, their age ranging from 14 to 16. Estimated body fat percentage was assessed by skinfold caliper at the biceps, triceps, suprailiac and sub scapular. The experiment was of 6 weeks, 5 days a week for duration of 30 min. Percentage of fat was taken according to the assessment of body composition chart by JVGA Durnin and M M Rahaman. Paired t test was applied at the result was tested for significance 0.05 level. The ‘t’ value of the pre and post means of experimental group and control group was 0.01 which was very less than the required value of 2.14 (0.05 level). The finding reveals that no significant differences found between the pre and post test of experimental and control group may be attributed to the fact that the selected age group was an active participant and having a hectic schedule which keep the fat percentage to a very low level. This indicated that the SuryaNamaskar practice has no effect on the body composition of female students.

Fondran, & Kristine, M. (2008) observed the effects of a twice daily SuryaNamaskar yoga practice on resting heart rate (HR) and blood pressure (BP), flexibility, upper body muscle endurance, and perceived well-being in low to moderately active adult males and females. i.e. Healthy Adults. (24 females, 6 males; mean age 34 years) were randomly assigned to a yoga or control group using the fishbowl technique of random assignment with replacement. After a 3 hour introduction to proper SN techniques, the subjects were directed to perform two SN routines daily for 10 minutes each followed by a 5 minute relaxation period, 5 times per week for a period of 6 weeks. Pre and post measurements were conducted for HR, BP, hamstring flexibility, upper body muscle endurance, and perceived well-being. Inferential statistics with repeated measures (2-way ANOVA) was used to analyze the data. Results: A significant increase was found in flexibility with an improvement of 2.9 inches (p=.000) and 4.4 push-ups (p=.003) after yoga training program, with little or no change in the control group. Conclusion: It was concluded that SN is effective in increasing hamstring flexibility and improving upper body muscle endurance. Near about same study studied by Shankar, G.& Pancholi, B. (2011) determined the effects of SuryaNamaskar yoga practice on resting heart rate (HR), blood pressure (BP), flexibility and upper body muscle endurance in low to moderately active adult males and females. A total of 80 normal healthy subjects (40 males and 40 females) between age group 18-40 years from Sumandeep Vidyapeeth University were randomly assigned a yoga or control group. After introducing to proper
SuryaNamaskar techniques, the subjects were directed to perform two SuryaNamaskar routines daily for 10 minutes each followed by a 5 minute rest period, for duration of two weeks. The post-hoc ‘t’ test showed a significant (p=0.000) increase in flexibility and push-ups and decreased blood pressure in yoga group, with little or no change in control group. They concluded that SuryaNamaskar is effective in increasing hamstring flexibility and improving upper body muscle endurance and helps to reduce blood pressure.

The energy cost and a different cardio respiratory change during the practice of SuryaNamaskar was instituted by Sinha, U., Sinha, U., Ray, S., Pathak, A & Selvamurthy, W. (2004). 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 Kapal Bhathi (breathing maneuvers) for 2 min then Yogamudra (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 and lowest in the first posture. Total energy cost throughout the practice of SN was 13.91 k.cal and at an average of 3.79 k.cal/min. During practice highest HR was 101 ± 13.5 b.p.m. 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. Energy cost cardio respiratory changes to the Sun. Sequence of Asanas was developed in the much later period as compared to the other Hatha Yogic Asanas.

Bhutkar, P.M., Bhutkar, M.V., Taware, G.B., Doijad, V. & Doddamani, B.R. (2008) predicted 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). 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 ergometry and various lung functions.
tests, in both male and female subjects. Reviewing this study Bhutkar, P.M. et al. concluded, that SuryaNamaskar practice can be advocated to improve cardio-respiratory efficiency for patients as well as healthy individuals.

**Ananda, B.B., Kaviraja, U. Madanmohan & Ravindra, P.N. (2011)** determined the differential effect of 6 months training in the fast and slow versions. 42 school children in the age group of 12–16 years were randomly divided into two groups of 21 each. Group I and Group II received 6 months training in performance of slow SuryaNamaskar (SSN) and fast SuryaNamaskar (FSN), respectively. Training in SSN produced a significant decrease in diastolic pressure. In contrast, training in FSN produced a significant increase in systolic pressure. Although there was a highly significant increase in isometric hand grip (IHG) strength and hand grip endurance (HGE) in both the groups, the increase in HGE in FSN group was significantly more than in SSN group. Pulmonary function tests showed improvements in both the groups though intergroup comparison showed no significance difference. Maximum inspiratory pressure (MIP) and maximum expiratory pressure increased significantly in both the groups with increase of MIP in FSN group being more significant than in SSN. Study reports that SN has positive physiological benefits as evidenced by improvement of pulmonary function, respiratory pressures, hand grip strength and endurance, and resting cardiovascular parameters. It also demonstrated the differences between SN training when performed in a slow and fast manner, concluding that the effects of FSN are similar to physical aerobic exercises, whereas the effects of SSN were similar to those of yoga training. SuryaNamaskar help to achieve a sense of well being and purpose. It is a spiritually uplifting exercise and promotes a keen awareness of the interconnectedness of body, mind and breath.

**Summary**

SuryaNamaskar is a complete body-mind workout. (Tiwari, O.P., 2000). SuryaNamaskar or Sun Salutation is the best way to burn the calories and reduce weight. It is often recommended for obesity. (Singh, A.S., 2010). As an aerobic exercise SuryaNamaskar seemed to be ideal as it involves both static stretching and slow dynamic component of exercise with optimal stress on the cardio respiratory system. (Sinha, U.S., et al.2004). SuryaNamaskar is effective in increasing hamstring flexibility and improving upper body muscle endurance and helps to reduce blood pressure. (Fondran, & Kristine, M. (2008). Regular practice of SuryaNamaskar improves cardio-respiratory efficiency for patients as well as healthy individuals.
(Bhutkar, P. M., et al. 2008). SuryaNamaskar has helped to achieve a sense of well-being and purpose. It is a spiritually uplifting exercise and promotes a keen awareness of the interconnectedness of our body, mind and breath. (Ananda, B. B., et al. 2011). However, SuryaNamaskar practice has shown no effect on the body composition of female students. (Shukla, S. 2010).

The reviews given above have found SuryaNamaskar to be a complete mind-body workout. It strengthens the core while improving fitness parameters along with cardio-respiratory efficiency.

### 2.4 Restorative Yoga

There are various styles of hatha yoga, and each has specific characteristics that reflect a particular approach to the yoga asanas such as Iyengar, Kundalini, Kripalu, and Sivananda. Iyengar, a popular style is based on the teachings of living yoga master named B.K.S. Iyengar. The method is orderly and progressive, postures are adjusted to meet the needs and physical conditions of the subject.

In an article on yoga therapy Garfinkel, M.H. & Schumacheryright, R. (2009) granted yoga as a system designed to refine human physiology asanas, or postures, if done properly, are believed to affect every gland and organ in the body. Postures have to be adjusted so that the various organs, joints, and bones are properly positioned so that physiologic changes may occur. Distribution of body weight has to be even on the joints and muscles so that there is no injury. Therapeutic yoga is the performance of postures for treating medical disorders. A key development in this application of yoga is Iyengar's use of props (e.g., chairs, belts, blankets, blocks) to assist the patient in assuming the posture without strain. It is said that each posture has a specific shape to which the body must be adapted and not the asana to the body. In a disease like osteoarthritis (OA) of the finger joints, asanas are proposed to realign the skeletal structure and loosen stiff joints. Effects may be the result of the geometry of the asana. Many musculoskeletal problems may be mechanical and have to be mechanically considered. Realignment of muscles is proposed to remove the altered stresses and strains and to re-establish anatomic relationships.

Kristin, A. & Joseph, A. (2012) stated in an article that Restorative yoga is a healing form of hatha yoga that facilitates deep relaxation with gentle poses supported by bolsters, blankets and other props. This practice is often called active or conscious relaxation. This modified version of yoga can act as an effective tool to strengthen the
immune system, soothe the nervous system, quiet the mind and allow the practitioner to release deep tension and stress. The foundation of restorative yoga is derived from the teachings of B.K.S. Iyengar, a world renowned yoga guru from Pune, India. Many restorative yoga poses are similar to normal yoga poses, except that they are performed with the support of props. Some of the yoga props used in restorative yoga are bolsters, straps, blankets, balls, towels, chairs, walls, eye bags and pillows. The use of props for support helps the practitioner hold poses without effort or strain. This improves circulation and enhances heart function. Each restorative yoga pose is held for at least a few minutes or as long as is comfortable. This allows for time to deeply relax every muscle and tissue in the body along with the mind. Restorative yoga is appropriate for any fitness level and can be a perfect complement to other styles of yoga and other forms of exercise. Restorative yoga utilizes variations and modifications, so it is a gentler version of the traditional discipline. The reduced intensity of the activity makes it more accessible and a great practice for people who are dealing with injuries, chronic pain or physical illness.

Lasater, J. (2009) concedes an article on restorative yoga, which concurs with Garfinkel and Allen regarding specific physiological responses which are beneficial to health and can reduce the effects of stress-related diseases. Anthropologists tell us the body that experiences stress has not changed much over the millions of years of human being. Our ancestors had the same anatomical and physiological characteristics as we who drive freeways and communicate via the information superhighway. We have an ancient body subjected to a modern problem: living with chronic stress. Refer to restorative yoga poses as active relaxation. By supporting the body with props, we alternately stimulate and relax the body to move.

Restorative Asanas for a Healthy Immune System, admits Schatz, M. P. (n.d.) states regular practice of the classical yoga asanas can be quite helpful in creating a healthy immune system and the proper environment for its functioning. The following restorative asanas are taught by B. K. S. Iyengar at the Ramamani Iyengar Memorial Yoga Institute in Pune, India. They are extremely effective in producing the relaxation response and in counteracting the negative effects of the stress response on the immune system. These asanas are useful for their calming, nurturing effects and are especially valuable when one is too sick or weak to perform the more vigorous, classical poses. The healthy yoga practitioner can also benefit from these poses during times of stress, fatigue, or low energy. The restorative asanas differ from free-
standing yoga poses, which are held in proper alignment by muscular action, to a maximum of 10 to 15 second per posture, coming out of a pose if it becomes uncomfortable, or if relaxation becomes an effort. The example would be the modification of Supta Virasana for use as a restorative asana requires sufficient propping to support the trunk comfortably, while keeping the knees in contact with the floor and the thighs parallel, insufficient padding may result in hyperextension of the neck in persons with limited shoulder flexibility.

Paul, P., Hayden, J., Iyengar, B. K.S., Wolf, S.S., Clennell, B., & Miller, E.B. (2008) admitted, Iyengar Yoga Association most responsible for the explosion of interest in using asana and pranayama "therapeutically". We hesitate to use the term "therapeutic Yoga" because it may give the misleading impression that there are different kinds of Yoga, with "therapeutic Yoga" being but one variety. B.K.S. Iyengar has spent his lifetime illuminating the fact that all Yoga is therapeutic. It is the ultimate art and science for liberating man from all suffering—physical, mental, and spiritual. Physical and mental well-being is side-benefits of one's efforts on the path of Yoga. People suffering from various disorders, are a fertile training ground for Yoga in seeking to understand the therapeutic aspects of Yoga. The restorative poses, intelligently sequenced and correctly propped, have a profound effect.

Donesky-Cuenco, D.A.(2009) experimented pilot study to evaluate a yoga program for its safety, feasibility, and efficacy for decreasing dyspnea intensity (DI) and dyspnea-related distress (DD) in older adults with COPD who were randomized to a 12-week yoga program specifically designed for people with COPD or usual-care control (UC). The twice-weekly yoga program included asanas (yoga postures) and visama vritti pranayama (timed breathing). Safety measure outcomes included heart rate, oxygen saturation, dyspnea, and pain. Feasibility was measured by patient-reported enjoyment, difficulty, and adherence to yoga sessions. At baseline and at 12 weeks, DI and DD were measured during incremental cycle ergometry and a 6-minute walk (6MW) test. Secondary efficacy outcomes included physical performance, psychologic well-being, and health-related quality of life (HRQoL). There were small positive changes in muscle strength and HRQoL. Participated safely in a 12-week yoga program especially designed for patients with this chronic illness. After the program, the subjects tolerated more activity with less DD and improved their functional performance.
Kimberly, W., Christiaan, A., Lois, S., Edward, D., Beverly, E., David, S.; Gerry, H., Richard, G., George, K., & Linda, K. (2009) predicted the effectiveness and efficacy of Iyengar yoga for chronic low back pain (CLBP) were assessed with intention-to-treat and per-protocol analysis. Ninety subjects were randomized to a yoga (n = 43) or control group (n = 47) receiving standard medical care. Participants were followed 6 months after completion of the intervention. 12 (midway), 24 (immediately after), and 48 weeks (6-month follow-up) after the start of the intervention using the Oswestry Disability Questionnaire, a Visual Analog Scale, the Beck Depression Inventory, and a pain medication-usage questionnaire. Using intention-to-treat analysis with repeated measures ANOVA (group × time), significantly greater reductions in functional disability and pain intensity were observed in the yoga group when compared to the control group at 24 weeks. A significantly greater proportion of yoga subjects also reported clinical improvements at both 12 and 24 weeks. In addition, depression was significantly lower in yoga subjects. Furthermore, while a reduction in pain medication occurred, this was comparable in both groups. Per-protocol analysis, improvements were observed for all outcomes in the yoga group, including a greater trend for reduced pain medication usage. Although the yoga group had statistically significant reductions in functional disability, pain intensity, and depression slightly less than 24 weeks

Randomized controlled clinical trial among 410 cancer survivors about sleep, fatigue, and quality of life treated by YOCAS yoga. Mustian, K. M., Palesh, O., Sprod, L., Peppone, L. J., Heckler, C. E., Yates, J. S., Reddy, P. S., Melnik, M., Giguere, J. K. & Morrow, G. R. (2010) impaired sleep quality (SQ) and fatigue are the most prevalent and troublesome side effects experienced by cancer survivors and both significantly impair quality of life (QOL). Conducted a nationwide, multi-site, phase II/III randomized, controlled, clinical trial examining the efficacy of yoga for improving SQ, fatigue and QOL among cancer survivors through the University of Rochester (UR) Cancer Center Community Clinical Oncology Program (CCOP) Research Based. Non-metastatic, cancer survivors suffering from moderate or greater sleep disruption between 2-24 months after completing adjuvant therapy with no participation in yoga during the previous 3 months were randomized into 2 arms: 1) standard care monitoring and 2) standard care plus the 4-week (wk) yoga intervention (2 x's/wk; 75 min./session). The yoga intervention utilized the UR Yoga for Cancer Survivors (YOCAS) program consisting of pranayama (breathing exercises), 18
gentle Hatha and Restorative yoga asanas (postures) and meditation. SQ, fatigue and QOL were assessed pre- and post-intervention. The brief community-based YOCAS yoga intervention significantly improves SQ, fatigue, and QOL while reducing sleep medication use among survivors. Clinicians should consider prescribing the YOCAS program for survivors reporting impaired sleep and fatigue.

Kolasinski, S. L., Garfinkel, M., Tsai, A.G., Matz, W., Dyke, A.V., & Schumacher, H. R., (2005) assessed the feasibility of using yoga in the tradition of B.K.S. Iyengar to treat the symptoms of osteoarthritis of the knee. Participants were instructed in modified Iyengar yoga postures during 90-minute classes once weekly for 8 weeks. Participants met ACR criteria for osteoarthritis of the knee and completed a medical history and physical examination, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Arthritis Impact Measurement Scale 2 (AIMS2), Patient Global Assessment (GA) by Visual Analog Scale (VAS), Physician GA by VAS, and 50-foot Walk Time before and following an 8-week course of yoga instruction. Eleven (11) subjects enrolled, nine completed at least one session and seven (six of whom were obese) had data from pre- and post-course time points available for analysis. This pilot study suggests that yoga may provide a feasible treatment option for previously yoga-naive, obese patients >50 years of age and offers potential reductions in pain and disability caused by knee OA.

Danhauer, S. C., Mihalko, S. L., Russell, G. B., Campbell, C. R., Felder, L., Daley, K. & Levine, E. A. (2009) researched the feasibility of implementing a RY intervention for women with breast cancer; and examined group differences in self-reported emotional, health-related quality of life, and symptom outcomes. Women with breast cancer (n=44; mean age 55.8 years) enrolled in this study; 34% were actively undergoing cancer treatment. Study participants were randomized to the intervention (10 weekly 75-minute RY classes) or a waitlist control group. Participants completed questionnaires at Week 0 (baseline) and Week 10 (immediately post-intervention for the yoga group). The yoga group demonstrated a significant within-group improvement in fatigue; no significant difference was noted for the control group. Although limited by sample size, these pilot data suggest potential benefit of RY on emotional outcomes and fatigue in cancer patients. Study demonstrates that a RY intervention is feasible for women with breast cancer; implications for study design and implementation are noted with an emphasis on program adoption and participant adherence.
DiBenedetto, M., Innes, K.E., Taylor, A.G., Rodeheaver, P.F., Boxer JA, Wright, H.J., & Kerrigan, D.C. (2005) observed a gentle Iyengar yoga program on gait in the elderly: an exploratory study, to determine 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. Single group pre-post test exploratory study. A 3-dimensional quantitative gait evaluation, including kinematic and kinetic measurements, was performed pre- and post intervention. Changes over time (baseline to post intervention) in primary and secondary outcome variables were assessed using repeated-measures analysis of variance. Yoga exercises were performed in an academic medical center (group classes) and in the subjects’ homes (yoga home-practice assignments). Pre- and post assessments were performed in a gait laboratory. Twenty-three healthy adults (age range, 62–83y) who were naive 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. Peak hip extension, average anterior pelvic tilt, and stride length at comfortable walking speed. Peak hip extension and stride length significantly increased (F1, 18=15.44, P<.001; F1, 18=5.57, P=.03, respectively). We also observed a trend toward reduced average pelvic tilt (F1, 18=4.10, P=.06); adjusting for the modifying influence of frequency of home yoga practice strengthened the significance of this association (adjusted F1, 17=14.30, P=.001). Both the frequency and duration of yoga home practice showed a strong, linear, dose-response relationship to changes in hip extension and average pelvic tilt. 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.

The effectiveness of holistic approach of yoga therapy for migraine treatment compared to self-care, was investigated by Paul, P., Hayden, J., Iyengar, B. K.S., Wolf, S.S., Clennell, B., & Miller, E.B. (December, 2008) to using a randomized controlled trial Methods Seventy-two patients with migraine without aura were randomly assigned to yoga therapy or self-care group for 3 months. Primary outcomes
were headache frequency (headache diary), severity of migraine (0–10 numerical scale) and pain component (McGill pain questionnaire). Secondary outcomes were anxiety and depression (Hospital anxiety depression scale), medication score. After adjustment for baseline values, the subjects' complaints related to headache intensity (P < .001), frequency (P < .001), pain rating index (P < .001), affective pain rating index (P < .001), total pain rating index (P < .001), anxiety and depression scores (P < .001), symptomatic medication use (P < .001) were significantly lower in the yoga group compared to the self-care group. The study demonstrated a significant reduction in migraine headache frequency and associated clinical features, in patients treated with yoga over a period of 3 months.

**Summary**

The above articles and experiments, elaborate that restorative yoga utilizes variations and modifications, so it is a gentler version of the traditional discipline. An article by Kristin, A. & Joseph, A. (2012), Garfinkel, M.H. & Schumacheryright, R. (2009), Lasater, J. (2009), & Schatz, M. P. (n.d.) commonly granted, Restorative yoga poses as active relaxation and props for support helps the practitioner hold poses without effort or strain. People suffering from various disorders, are a fertile training ground for Yoga in seeking to understand the therapeutic aspects of Yoga. The restorative poses, intelligently sequenced and correctly propped, have a profound effect. (Paul, P.J. et al. 2008).found that assistive yoga poses and props for support are effective in providing active relaxation, reduced intensity of the activity makes it more accessible and a great practice for people for easy and safe sedentary life. (Kristin, A. & Joseph, A., 2012). Yoga programs tailored for elderly adults may offer a cost-effective means of preventing or reducing age-related changes. (DiBenedetto, M., et al.2005).A significant reduction in migraine headache frequency and associated clinical features, was found in patients treated with yoga over a period of 3 months. (Paul, J.P., et al., 2008). Kimberly, W., et al, 2009.found that after 24 weeks yoga intervention, the yoga group had statistically significant reductions in functional disability, pain intensity, and depression.

To conclude, Restorative yoga has been found to have a therapeutic approach for rehabilitation, is appropriate for any fitness level and can be a perfect complement to other styles of yoga and other forms of exercise. The use of props has also proved to be beneficial by providing the necessary support and thereby making it attainable.
2.5 Breathing Power

Breath is life and life is breath. Breath is the key to the mystery of life. A human life is measured from the first to the last breath. Breathing is not only an instinctive relax to satisfy the need of body for oxygen but it has been considered that controlled breathing can be used as a technique for enhancing physical and mental power.

Raghuraj, P. & T. Shirley (2000) presented a paper on the effect of pranayama on (i) sensory information processing which is better following pranayama practice, (ii) autonomic and metabolic activities where surya anuloma viloma(breathing exclusively through right nostril) has been shown to be sympathetic activating (with increased heart rate and systolic BP, increased peripheral vasoconstriction) and increased metabolic rate, (iii) muscle strength - which increases following pranayama and also the possible application of pranayama in treating metabolic, psychosomatic and psychiatric disorders. Hence pranayama practice optimizes physical involuntary functions and higher nervous functions.

Muktamath, U., & Ganiger, B. (2010) stated that in day to day life stress has become a big problem in our society, especially in sports. Though a top class sportsman is having scientific coaching and proper nutrition, still he lacks in showing top class performance because of more stress. Stress always hampers the performance of an individual in sports competitions. Pranayama is the fourth limb and meditation is the seventh limb of ashtanga yoga. Its full significance has to be properly understood and appreciated, it consists of two components, pran and ayama. Pran as introduced by Sri Yogendra has bio-energy and ayama means control or discipline. The real meaning of pranayama, therefore, is control of bio-energy. Prana is an essential living activity agent that works in the human body and makes the various functions of the body possible. Since stress is a main hurdle to the performance of sports men it should be given higher priority and be treated. Numerous physiological effects have been reported due to meditation and pranayama. Lowering the heart beat rate and metabolism, as well as respiration and blood pressure. Also, the meditators significantly improve in the 50 m dash, standing broad jump and in an agility test. Since it does not require any costly instrument, simple in nature, it can be adapted to any field to get rid of stress.

Telles, S., Raghuraj, P., Maharana, S., & Nagendra, H.R.(2007) illustrated immediate effect of three yoga breathing techniques on performance on a letter-
cancellation task. The effects of three yoga breathing practices were evaluated on performance on a letter-cancellation task which is a left-hemisphere dominant task. The three yoga breathing practices (right, left, and alternate nostril breathing) were selected because unilateral forced nostril breathing stimulates the contra lateral hemisphere. There were 20 male volunteers whose ages ranged from 20 to 45 years (M age=28.4 yr., SD=5.7). All subjects were assessed before and after four sessions, i.e., right nostril yoga breathing, left nostril yoga breathing, alternate nostril yoga breathing, and breath awareness as a control. The letter-cancellation task scores were significantly improved, i.e., there were fewer errors following right and alternate nostril yoga breathing (Wilcoxon paired signed-ranks test). The improved performance may be related to the enhancement of contra lateral hemisphere function found with selective nostril breathing.

Shankarappa V., Prashanth P., Nachal, A., & Malhotra, V. (2012) predicted the effects of short-term pranayama (6 weeks) on the pulmonary function parameters. The study group consisted of 50 young adults (26 males and 24 females) who were newly recruited for yoga training at the Patanjali Yoga Center, Kolar. They were motivated to undergo pranava, Nadishuddi and Savitri Pranayama training for 1 hour daily, for 6 days a week. The first phase of the recording of the pulmonary parameters was done at the beginning of their course. The second phase of the recording was done after 6 weeks of the regular pranayama practice. P value of <0.001 was considered as statistically significant. There was a statistically significant increase in all the above lung parameters in the regular yoga practitioners. Pranayama is a type of yogic breathing exercise. This result an effect of pranayama can be used as a lung strengthening tool to treat many lung diseases like asthma, allergic bronchitis, post pneumonia and tuberculosis recoveries, and many occupational diseases. Pranayama has its various benefits in different way.

Tapas, P., Sharma, H.O., Mishra, S., Mishra, A., Prajapati, R., & Singh, S. (2009) checked the immediate effect of slow pace pranayama blood pressure and heart rate to evaluate the immediate effect of slow pace pranayama (respiratory rate6/min) for 5 minutes on heart rate and blood pressure and the effect of the same breathing exercise for the same duration of time (5 minutes) oral intake of hyoscine-N-butyl bromide (Buscopan), a parasympathetic blocker drug. Heart rate and blood pressure of volunteers (n = 39, age = 25–40 years) was recorded following standard procedures, and the other group (n = 10) took part in another study where their blood
pressure and heart rate were recorded following half an hour of oral intake of hyoscine-N-butyl bromide 20 mg. Slow pace pranayama (respiratory rate 6/min) exercise thus shows a strong tendency to improving the autonomic nervous system through enhanced activation of the parasympathetic system.

Upadhyay, D.K, Malhotra, V., Sarkar, D., & Prajapati, R. (2008) illustrated the effect of alternate nostril breathing exercise on cardio respiratory functions. Pranayama (breathing exercise), one of the yogic techniques can produce different physiological responses in healthy individuals. The responses of Alternate Nostril Breathing (ANB) the 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. Indicate, regular practice of Alternate Nostril Breathing (ANB) (Nadisudhi) increases parasympathetic activity.

Ashok, C. (2010) determined impact of asanas and pranayama on blood oxygen saturation level Consistent practice of yoga postures and pranayama increases the lung's airflow, air capacity, stamina and efficiency. Back bending postures open the chest, improving both lung and heart functions. Upper back bends and chest opening postures relieve hardness if it is harder to exhale during asthma attacks. Forward bends and lower back bending poses relieve difficulty if it is more difficult to inhale. Inverted postures drain excess mucus from the lungs and balance the immune system. A general yoga practice reduces stress, physical tension, and muscle tightness and increases overall feelings of well being by activating the parasympathetic nervous system. Blood carries oxygen in two forms, the majority is bound to hemoglobin (oxyhaemoglobin) and the rest is dissolved in the aqueous phase of blood (the plasma). The dissolved fraction is dependent upon the partial pressure of oxygen. As the partial pressure increases, the dissolved fraction of oxygen increases. Hence the experimenter was very much interested in studying the effect of asanas and pranayama in blood oxygen saturation level at ear. Thus three groups were studied – control, experimental-I and experimental-II. However the groups were assigned randomly to three conditions namely no treatment, treatment as asanas and treatment
as pranayama. The analysis of covariance had been worked out and the obtained F is 3.75 for 2 and 11 df falls short of the critical value of 3.98 at 0.05 level. It was observed from the study that the three groups differ significantly. Kasiganesan, H., Malhotra, A.S., Pal, K., Prasad, R., Kumar, R., Kain, T.C., Rai, L., & Sawhney, R. C. (2004) evaluated effects of Hatha yoga and Omkar meditation on cardio respiratory performance, psychological profile, and melatonin secretion. Thirty healthy men in the age group of 25-35 years volunteered for the study. They were randomly divided in two groups of 15 each. Group 1 subjects served as controls and performed body flexibility exercises for 40 minutes and slow running for 20 minutes during morning hours and played games for 60 minutes during evening hours daily for 3 months. Group 2 subjects practiced selected yogic asanas (postures) for 45 minutes and pranayama for 15 minutes during the morning, whereas during the evening hours these subjects performed preparatory yogic postures for 15 minutes, pranayama for 15 minutes, and meditation for 30 minutes daily, were measured before and after 3 months of yogic practices. Yogic practices for 3 months resulted in an improvement in cardio respiratory performance and psychological profile. Yoga group showed a significant correlation (r = 0.71, p < 0.05) with well-being score. These observations suggest that yogic practices can be used as psycho physiologic stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being.

Meditation effect on cardiovascular disease was studied by Suchday, S., Dziok, M., Katzenstein, M., Erica, K. & Kahan, M. (2012) cardiovascular disease is a chronic illness with physiological, behavioral, and psychosocial components implicated in the etiology and course of the disorder. The Effects of Meditation and Yoga. One study determined that 11 weeks of yoga practice for 1 h/day had the same effect as pharmacological therapy in regulating blood pressure in healthy adults between the ages of 33 and 65. Cardiovascular disease is a chronic illness with physiological, behavioral, and psychosocial components implicated in the etiology and course of the disorder. Given its multifaceted nature, management of cardiovascular disease needs to be multidimensional and include attention to all risk factors. Research has indicated that modification of one risk factor (e.g., diet) does not lead to automatic benefits to other risk factors (e.g., exercise), attention needs to be focused simultaneously on both physiological and psychological components. For example, medical regimens need to be augmented by lifestyle changes that include diet and exercise. Psychosocial
variables such as depression, hostility, and stress also play a key role in morbidity and mortality associated with cardiovascular disease and need to be independently managed. An explicit focus on techniques that involve concurrent physiological and psychological interventions makes mind-body therapies effective and appealing in dealing with cardiovascular disorders. Mind-body medicine is the most widely used domain of complementary and alternative medicine among the US population for treatment of medical conditions (NIH, 2004). Examples of mind-body medicine include meditation, yoga, relaxation, visual imagery, biofeedback, qigong, cognitive-behavioral therapies, support groups, tai chi, and spirituality.

**Doijad, V.P. & Surdi, A.D. (2011)** find effect of short term Yoga practice on cardio-respiratory fitness. Measure cardio-respiratory fitness parameters before and after Yoga practice conducted on 60 subjects, who came voluntarily as subjects for the project, (40 boys and 20 girls). Age ranged between 18 to 20 years. Pulse rate and respiratory rate measured in supine position. B.P. measured using mercury sphygmomanometer. 40mm Hg endurance test was conducted by using mercury sphygmomanometer. Resting pulse rate, Respiratory rate and blood pressure was found to be decreased and 40mm endurance time was found to be increased in both male and female subjects. (Doijad, V.P. et al. (2011) concluded that yoga practice can be advocated to improve cardio-respiratory efficiency for patients as well as healthy individuals.

**Summary**

The literature review has focused on the most widely studied and used interventions, specifically, yoga and meditation. Numerous physiological effects have been reported due to meditation and pranayama. Lowering the heart beat rate and metabolism, as well as respiration and blood pressure, significantly improve in the 50 m dash, standing broad jump and in an agility test. (Muktamath, V. et al. (2010). Pranayam improved performance related to the enhancement of contra lateral hemisphere function found with selective nostril breathing. (Telles, S.P. et al. (2007). Short term Yoga practice can be advocated to improve cardio-respiratory efficiency for patients as well as healthy individuals. (Doijad, V.P. & Surdi, A.D. (2011). Yogic practices can be used as psycho physiologic stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being. (Kasiganesan, H. et al. 2004). Pranayama (breathing exercise), one of the yogic techniques can produce different physiological responses in healthy individuals. Regular practice of
Alternate Nostril Breathing (ANB) (Nadisudhi) increases parasympathetic activity was researched by (Upadhyay, D. et al.2008). Slow pace pranayama (respiratory rate 6/min) exercise shows a strong tendency to improving the autonomic nervous system through enhanced activation of the parasympathetic system. (Tapas, P., et al. (2008). Pranayama practice optimizes physical involuntary functions and higher nervous functions. (Raghuraj, P., & Shirley, T.2000). Short term pranayama (6weeks) was found to be statistically significant in all the pulmonary function parameters in the regular yoga practitioners. (Shankarappa V., & Prashanth, P.et al.2012).

An explicit focus on techniques that involve concurrent physiological and psychological interventions makes mind-body therapies effective and appealing in dealing with cardiovascular disorders. (Suchday, S. et al. 2012). Prana is an essential living activity agent that works in the human body and makes the various function of the body possible. Since it does not require any costly instrument is simple in nature, it can adapt to any field to get rid of stress.

2.6 Functional Fitness

Functional fitness means that the goal of working out is preparing your body so it can perform daily activities walking, bending, lifting, and climbing stairs without pain, injury or discomfort. Leopold, A. K. (2004)

Deeg, D.J., Comijs, H. C., Thomése, G. C. F., & Visser, M.(2009) stated in his article, provided results from the Longitudinal Aging Study Amsterdam (LASA). LASA is a study on determinants and consequences of changes in daily functioning. Focus is on changes in physical functioning from longitudinal data, it is observed that many older people experience function loss, especially at higher ages. A host of factors are associated with function loss, such as chronic diseases, cognitive decline, depressive complaints, socio-economic status, and life style. A few of these factors are causal; others are characteristics of groups with raised chances of function loss. From trend analyses, it is apparent that the prevalence of functional limitations is not fixed, but varies over time. The LASA study shows that this prevalence is increasing. In view of the absolute and relative rise of the number of older people in the population, it is of great importance to realize a lower prevalence of function loss and a delay of function loss to older ages

Cowens, V. S. (2010) observed functional fitness improvements after a worksite-based yoga initiative. This study explored the benefits of yoga on functional fitness,
flexibility, and perceived stress. A quasi-experimental design was used to measure benefits of yoga in a sample of firefighters from a major metropolitan fire department. Yoga classes were conducted on-shift, in the fire stations over the period of 6 weeks. The classes included pranayama (breathing), asana (postures), and savasana (relaxation); 108 firefighters enrolled in the study, most were physically active but had no prior experience with yoga. Baseline and post-yoga assessments were completed by 77 participants. Paired t-tests revealed significant improvements in the Functional Movement Screen, a seven item test that measures functional fitness. Improvements were noted in trunk flexibility and perceived stress. Participants reported favorable perceptions of yoga: feeling more focused and less musculoskeletal pain along with retention. Majority of the participants indicate that participants benefited from yoga.

Seino, S., Yabushita, N., Kim, M.J., Nemoto, M., Matsuo, T., Fukasaku, T., Okuno, J., Okura, T., & Tanaka, K. (2009) conducted an exercise program in Japan, for pre-frail older adults (so-called "specified elderly individuals") (SEIs) has been prescribed under the newly developed long-term care insurance system. Three functional fitness measures (grip strength, one-leg balance with eyes open, and 5-m habitual walk) are used in the system; however, it has yet to be determined if applying these measures to SEIs is appropriate. Study was to develop a new test battery assessing functional fitness for SEIs, and to determine cross-validity and responsiveness of these measures. One hundred and twenty seven SEIs (76.6 +/- 5.9 yr) and 315 healthy older adults (HOAs) (72.2 +/- 5.8 yr) completed twelve functional fitness tests related to activities of daily living (ADL) and mobility. The SEI was defined by the Japanese Ministry of Health, Labour and Welfare in 2005. The test battery items were selected by logistic regression analysis. A functional fitness score (FFS) equation was developed by principal component analysis. 4 test items were selected for assessment of functional fitness in SEIs: tandem stance, 5-repetition sit-to-stand, alternate step, and timed up and go. Applying principal component analysis to the 4 selected functional fitness items, the first principal component was interpreted as total functional fitness. On equation was developed to estimate FFS based on first principal component coefficient of each variable: The cut-off value to distinguish SEIs from HOAs using receiver operating characteristic ROC curve was 0.065 (sensitivity 82.2%, specificity 81.9%). The cross-validity and responsiveness of the
FFS equation was considered acceptable. This newly developed test battery should be a useful tool for comprehensively evaluating functional fitness in SEIs.

Oesch, P. R., Kool, J.P., Bachmann, S., & Devereux, J. (2006), assessed comprehensive medical assessments in the majority of patients with chronic low back pain (CLBP) have failed to assess working capacity. Functional Capacity Evaluation (FCE) has become increasingly popular in the evaluation of working capacity in CLBP patients. This study investigates the influence of functional testing on decision making concerning medical fitness assessments for work. A randomized clinical trial comparing the effect of a function centre (FCT) versus a pain centre treatment (PCT) in patients with CLBP was performed. According to the legal requirements physicians issued Fitness for Work Certificates (FWCs) after rehabilitation. In the FCT group physicians were in possession of the results of FCE while this was not the case in the PCT group. Three experts assessed the FWCs and rated the quality and the information provided regarding working capacity in the previous work. Rating of the issued FWCs proved reliable (ICC = 0.77-0.92). Quality of FWCs and information regarding working capacity in the previous work differed significantly between the two groups (chi-square, p = 0.03, resp. = 0.008). There was a trend towards a higher attested work capacity in the FCT group (Mann-Whitney, p = 0.071). Functional Capacity Evaluation positively influences quality and information regarding working capacity of medical Fitness for Work Certificates in patients with chronic low back pain.

Solway, S., Brooks, D., Lacasse, Y., & Thomas, S. (2001) noted A Qualitative Systematic Overview of the Measurement Properties of Functional Walk Tests Used in the Cardio respiratory Domain. To perform a qualitative systematic overview of the measurement properties of the most commonly utilized walk tests in the cardio respiratory domain: the 2-min walk test (2MWT), 6-min walk test (6MWT), 12-min walk test (12MWT), self-paced walk test (SPWT), and shuttle walk test (SWT). Clinical trials and observational studies were included if they reported data on the validity, reliability, interpretability, or responsiveness of the 2MWT, 6MWT, 12MWT, SPWT, or SWT. Only studies conducted on patients with cardiac and/or respiratory involvement were included. Fifty-two studies examining measurement properties of the various walk tests were found: 5 studies on the 2MWT, 29 studies on the 6MWT, 13 studies on the 12MWT, 6 studies on the SPWT, and 4 studies on the SWT. Measurement properties were most strongly demonstrated for the 6MWT.
Correlations of 6MWT distance and maximal oxygen consumption ranged from 0.51 to 0.90. A change in distance walked of at least 54 m was found to be clinically significant for the 6MWT. Reliability was shown to be optimized when the administration of walk tests was standardized and at least two practice walks were performed. Patients with increased likelihood of postoperative complications, hospitalization, and death were identified by analysis of distance walked. Measurement properties of the 6MWT have been the most extensively researched and established. In addition, the 6MWT is easy to administer, better tolerated, and more reflective of activities of daily living than the other walk tests. Therefore, the 6MWT is currently the test of choice when using a functional walk test for clinical or research purposes.

**Thompson, C.J., Cobb, M. K., & Blackwell, J. (2007)** found the effect of a progressive functional training program on club head speed and functional fitness in older male golfers. Eighteen male golfers (age: 70.7 ± 9.1 [SD] years) were randomly assigned to an exercise (N = 11) or control (N = 7) group. The exercise group participated in an 8-week progressive functional training program including flexibility exercises, core stability exercises, balance exercises, and resistance exercises. Pre- and post measurements included club head speed of a driver by radar (exercise and Control) and Fullerton Senior Fitness Test measurements (exercise only). One-way analysis of covariance was performed on club head speed measurements using pretest measurements as the covariate. Paired t-tests were performed to analyze Senior Fitness Test variables. After the intervention, maximal club head speed increased in the exercise group compared with the control group. Additionally, improvements (p < 0.05) were detected for most Senior Fitness Test variables in the exercise group. Functional training program resulted in significant improvements in club head speed and several components of functional fitness.

**Phillips, Wayne, T. B., Melissa, J., Wagner, Carolyn, L., & Riley, C. (2006, September)** speculates the effect of Single Set Resistance Training on Strength and Functional Fitness in Pulmonary Rehabilitation Patients. The primary goal of pulmonary rehabilitation (PR) is for patients to achieve and maintain their maximum level of independence and functioning in the community. Traditional PR uses a predominantly aerobic/endurance approach to rehabilitation with little or no inclusion of exercises to increase strength. Few studies have investigated the impact of resistance training on PR despite growing evidence supporting its efficacy to improve
physical function (functional fitness) in both healthy individuals and those with chronic disease. To investigate the effect of single-set resistance training on strength and functional fitness outcomes in PR patients. Twenty PR patients, 60 to 81 years old, were randomly assigned to an 8-week endurance-based PR program (ET) or an ET plus resistance training program (RT). Strength increased in RT (P < .05) and decreased in ET for both upper and lower body. Functional fitness improved (P < .05) in 5 of 7 tests for RT compared with 2 tests for ET. Single set RT can elicit significant improvements in both strength and functional fitness, which is not obtained by traditional PR alone.

Garrigaab, M.G., & Guerraa, M. (2010) found the following results in measuring balance, Lower extremity strength and Gait in the elderly: Construct validation of an instrument. The purpose of the study was to determine the degree to which scores of a modified version of the ‘Timed Get Up and Go’ test (TGUG) were associated with other measures of functional performance. Thirty-seven community-dwelling older women (72.3 ± 5.5 years) volunteered to participate. Subjects were assessed when performing the modified TGUG test. Correlations between the performance-oriented mobility assessment (POMA), single-leg balance, five chair rises, fast and normal gait speed, knee extension and flexion strength, and the modified TGUG were conducted. Total time to perform the modified TGUG test was significantly correlated with normal and fast gait speed (p < 0.05). The Pearson correlation coefficients were −0.841 and −0.748, respectively. The time needed to perform several tasks of the modified TGUG test significantly correlated with five chair rises, and with right knee extensor strength (p < 0.05).

Rugelj, D. (2010) observed the effect of functional balance training in frail nursing home residents. The purpose of this study was to design and evaluate the specifically targeted functional balance training for a group of frail nursing home residents. Fifty residents of two nursing homes were assigned to an exercise and control group. Thirty-three participants (age 75.7 ± 6.7 years) in the balance training group finished 12 weeks of training protocol that consisted of 14 activities that challenged different balance subsystems. The results showed that the participants in the training group who reached higher score on Berg Balance Scale (BBS) (p < 0.001), were able to stand longer on a compliant surface with eyes opened and closed (p < 0.01 and p < 0.02, respectively), and were faster at both, the four square and ten meter walk tests (p < 0.001), whereas there were no changes for the control group during the same time.
period. Anyhow, functional improvement of balance did not reflect in the parameters of postural sway. Suggest that the specifically targeted functional balance training is effective as far as functional activities are concerned while this kind of training does not reflect as a change in the steadiness of the center of pressure (CoP).

**Ruzic, L. (2003)** determined the possible influence of high physical load in the workplace on the physical fitness of employees. The subjects (494 men) were tested by means of Baecke's questionnaire for evaluation of the Work Index, measuring occupational physical load. The EUROFIT battery of tests was used for testing the functional and motor abilities of the subjects. Subjects with a higher Work Index (n = 274) performed worse than the subjects with a lower Work Index (n = 220), indicating that high physical load in the workplace does not necessarily mean improvement in functional and motor abilities. The "heavy" workers were only found to have a stronger handgrip. This could be attributed to the fact that physical activity performed at the workplace did not have adequate intensity, volume, and duration to effect positive changes in other motor and functional capacities.

**Summary**

Going over the main points, the researcher has found sufficient evidence from the review of Functional fitness. Functional fitness is to do daily activity with ease and comfort. Functional training programs have been used in a variety of rehabilitation settings with documented success. (Thompson, C.J. 2007). Single set resistance training program (RT) can elicit significant improvements in both strength and functional fitness, which is not obtained by traditional pulmonary rehabilitation (PR). (Phillips. & Wayne, T.B. et al. 2006, September). Functional fitness can be improved by yoga training. (Cowen, V. S. 2010, January). Functional balance training is effective as far as functional activities are concerned while training does not reflect as a change in the steadiness of the center of pressure. (Rugelj, D. 2010, March) Physical activity performed at the workplace did not have adequate intensity, volume, and duration to affect positive changes in other motor and functional capacities. (Ruzic L, et al. 2003). Different walk test (57) conducted by researcher, finding were most strongly demonstrated for the 6MWT. (Solway, S.et al.2001) To support this Thompson, C.J., Phillips. & Wayne, T.B. et al., September, Cowen, V. S. and Ruzic L, Concluding from the literature given above, functional fitness could be achieved by physical activity, proper breathing technique, yoga therapy and SuryaNamaskar program and needs further investigation.
2.6.1 Studies Related to Functional Fitness of Women

Ability to function efficiently and effectively in work and leisure activities, and to be healthy, to resist hypo kinetic diseases, and to meet emergency situations. Women need to be functionally fit. Women have other responsibilities with maintaining their other responsibilities too like family, children, spouse, and household chores as well as maintaining personal and professional life. This indeed leaves them with practically no time for themselves or little time. One of this reason fitness is neglected by most female.

Fernanda, de., Daniela, N.R., Gomes, R., de Souza, V., Gianiaib, S.T., Bacellarc, S., Escobara, T., Stoungenbergd, M., Henrique, E. Dantas,a M. (2011) verified the correlation between static balance and functional autonomy in elderly women. The sample was a random selection of 32 sedentary elderly women (mean age = 67.47 ± 7.37 years, body mass index = BMI = 27.30 ± 5.07 kg/m2), who live in the city of Teresina in the state of Piauí, Brazil. Static balance was analyzed by stabilometric assessment using an electronic baropodometer which measured the average of the amplitude of postural oscillations in the right (RLD) and left (LLD) lateral displacements, anterior (AD) and posterior (PD) displacements, and in the elliptical area (EA) formed by the body's center of gravity. Functional autonomy was evaluated by a battery of tests from the LADEG protocol which is composed of: a 10 m walk (10 m W), getting up from a seated position (GSP), getting up from the prone position (GPP), getting up from a chair and movement around the house (GCMH), and putting on and taking off a shirt (PTS). The Spearman's correlation coefficient (r) indicated a positive and significant correlation between GPP and LLD (r = 0.382; p = 0.031), GPP and PD (r = 0.398; p = 0.024) and GPP and EA (r = 0.368; p = 0.038). These results show that sedentary elderly women who spent the greatest amount of time performing the getting up from the prone position (GPP) test achieved the largest mean amplitude of displacement leading to greater levels of instability.

Hanson, E.D. Srivatsan, S.R. Agrawal, S., Menon, K.S., Delmonico, M.J., Wang, M.Q., & Hurley, B.F. (2009) pointed out (a) the effects of strength training (ST) on physical function and (b) the influence of strength, power, muscle volume (MV), and body composition on physical function. Healthy, inactive adults (n = 50) aged 65 years and older underwent strength, power, total body composition (% fat and fat free mass [FFM]), and physical function testing before and after 22 weeks of ST. Physical function testing consisted of tasks designed to mimic common physical activities of
daily living (ADL). To improve internal validity of the assessment of mid-thigh intramuscular fat, subcutaneous fat, and knee extensors MV, a 10-week unilateral ST program using the untrained leg as an internal control preceded 12 weeks of whole-body ST. Strength, power, and FFM increased significantly with ST (all p < 0.05), whereas rapid walk, 5 chair stands, and get up and go time decreased significantly with ST in the overall group (all p < 0.05). Women improved significantly in both walking test times (both p < 0.05) but not in the stair climb test, whereas men improved in the stair climb test (p < 0.05) but not in walking test times. Multiple regression analysis revealed the highest R (0.28) for the change in chair stands time, followed by stair climb and usual walk at 0.27 and 0.21, respectively. ST improves performance in functional tasks important for ADLs. Changes in strength, power, and FFM are predictors of ST-induced improvements in these tasks.

Nakamura, Y., Tanaka, K., Yabushita, N., Sakai, T., & Shigematsu, V. (2007) evaluated the effects of exercise frequency on functional fitness in older women participating in a 12-week exercise program. Participants (67.8 ± 4.6 years) were divided into three different exercise groups (I, II, and III; n = 34) and a control group (Group C; n = 11). Group I participated in a 90-min exercise program once a week, for 12 weeks, while Group II attended it twice a week, and Group III attended three times a week. The exercise program consisted of a 10-min warm-up, 20 min of walking, 30 min of recreational activities, 20 min of resistance training, and a 10-min cool-down. The following items were measured before and after the program: muscular strength, muscular endurance, dynamic balance, coordination, and cardio respiratory fitness (6-min walking distance). Comparisons of baseline and post-intervention measures showed significantly greater improvements in body weight, coordination, and cardio respiratory fitness for Group III compared to the other groups (p < 0.05). In addition, the greatest improvements in body fat, muscular endurance, and dynamic balance were also observed in Group III (p < 0.05). However, no significant differences were found in muscular strength. Older women who participate in an exercise program three times a week gain greater functional fitness benefits than those who exercise less frequently. In order to improve functional fitness in older women, an exercise frequency of at least three times each week should be recommended. Aerobic resistance, functional autonomy and quality of life (QoL) of elderly women are impacted by a recreation and walking program.
Sung, K. (2009) analyzed the effects of 16-week group exercise program on the physical function (i.e., strength, flexibility, and balance) and mental health (i.e., self-esteem and depression) of older elderly women (>or=75 years old) compared with younger elderly women (<75 years old). Exercise is crucial in maintaining older women's health and well-being. However, because most elders have at least one chronic disease, their physical function declines, so their dependence on others for instrumental daily living activities often increases. Older women typically have multiple barriers to participation in physical activities including higher disability rates. Of the total of 40 older women (older than 65 years) enrolled, 21 were older elders and 16 were younger elders. Lower body strength (using 30-second chair test), flexibility (sit-and-reach test), and static balance (ability to balance on one leg with open and closed eyes) were assessed. Self-esteem (using Rosenberg’s Self-esteem Questionnaire) and depressive symptoms (using Yesavage’s Geriatric Depression Scale) were assessed. Two-way analysis of variance was used to examine the differences between the 2 age groups. The intervention program was effective in improving body strength, flexibility, static balance, and self-esteem, regardless of age. Furthermore, older elders receiving the intervention program demonstrated greater improvement in self-esteem than younger elders did, although there were intervention effects in both age groups. Elderly women can realize benefits from a group exercise program that can improve their functional ability and self-esteem, both important to cardiovascular health.

**Summary**

The intervention program was effective in improving body strength, flexibility, static balance, and self-esteem, regardless of age (Sung, K. 2009). Correlating between static balance and functional autonomy in elderly women who spent the greatest amount of time performing the getting up from the prone position (GPP) test achieved the largest mean amplitude of displacement leading to greater levels of instability. (Fernanda de, N.R.D. et al. 2011). To improve functional fitness in older women, an exercise frequency of at least three times each week should be recommended. (Nakamura, Y., et al. 2007). Above literature depicts, that physical activity, exercises and practicing yoga improve functional fitness in women and that there are various ways to improve functional fitness.
2.7 Overall Summary
The literature review given above points out that future research should replicate these findings in more natural settings with different populations, experimentation, dependent, independent variables, with different programs. The literature presented in the earlier part in this section indicates that ample research investigations have been done on SuryaNamaskar, Yoga, fitness related with females and their personal as well professional problems. Many investigators have suggested different training schedules of exercises and strategies for enhancing functional fitness.

The reviews stress the usefulness of yoga for women in the improvement of fitness. It basically improves agility, flexibility, metabolic rate and leads to good health. Basically all studies have established that yoga is appropriate for all fitness levels and have emphasized the efficacy of Pranayama and Omkar Chanting in improving pulmonary function. Even studies in SuryaNamaskar have proven to be effective on core strength, and it is considered a complete body mind workout for improving cardio respiratory functions as well. The important aspect highlighted is that these traditional forms have shown significant effects in women even in the short term.

As the researcher feels that training strategies for enhancing fitness must be based on the scientific reasoning and the composition of such training must be formulated depending upon teachers’ lifestyle. Screening the reviews given above, the researcher has designed customized programs which could help to improve functional fitness of the teaching community.

Thus, the researcher designed the customized program comprising of two modules, Module I (SuryaNamaskar and Omkar Chanting), Module II (Assistive Yoga and Pranayama) with a duration of eight weeks training and experimented on the secondary school female teachers, with a view to evaluate their efficacy in improving functional fitness, further, the carryover effect of the training program would be the new dimension added by the researcher would further ascertain and establish the use of such traditional forms.
References


Kathleen, L. (2010). Yoga; sun salutation; suryanamaskara; flexibility; upper body strength; hamstring flexibility; perceived well-being. *Journal of Advance Development in Research, 1*(1) P 72.


