CHAPTER II

REVIEW & LITERATURE
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REVIEW OF THE LITERATURE

In any research study review of relevant research studies have special significance, for the simple reason that the review helps us in many ways like it provides information about the areas that are either unexplored or poorly explores as well as reviews one gets information about the antecedent variables of the factors that are being studied. It is also possible to collect information about the strategies to be designed for the study undertaken.

This study was designed to investigate the effects of Yoga and curling exercises on the three point shooting accuracy in Basketball players. To collect the review of the researchers and studies conducted on the same type of topic (Paralar) from the libraries of university of Nanded, Dr. B.A.M. University, Aurangabad, R. S. T. Mu University, Nagpur, S.G.M. University, Amravati and H.V.P.Mandal Amravati were collecte by the scholar. Foreign setting has been mostly referred due to unavailability of sufficient studies in Indian setting.

Sincere efforts has been made by the research scholar to locate the related literature.

Some of the relevant studies are reviewed here as follows:
Austin Swain and Graham Jones: These two writers written a Research paper on Effect of Goal-setting interventions on selected Basketball skills. This paper published in Research Quarterly for Exercise and Sports in 1995 by the American Alliance for Health Physical Education, Recreation and Dance.

Objective of the study:

1) To understand why and how goal shooting should produce enhance task performance.

2) To know the involvement of mental and physical action towards goal.

3) To develop a greater understanding of the medranisam that underpin the goal setting performance relationship.

Method: The subject were four members of the starting five of a mains University Basketball squad located in Central England who were computing during the 1991-92 season. (Age – 21.6, SD. 2.14). All subject had been playing competitive Basketball for a minimum of 6 years and without exception, had played interstate representative Basketball at some stage in their careers. In addition each player had considerable experience playing at the university level. A fifth player was originally involved in the study but had to be removed from the analyses because injury forced his withdrawal during the course of the post intervention phase.

Measures: Performance was assessed on a slightly modified version of the objective measure of Basketball performance that was developed by Sanstroem and Barnardo.
In this particular study, however the emphasis was not on the total score but on the values for the individual components of performance, performance feedback was provided for each player on each component in the form of game statistics that were posted on the team notice board.

**Design and procedure:** A multiple-base line design was used in this study. The baseline observations collected for all town subjects were those derived from their performances during first eight games of the season. Previous investigation have introduced the intervention to subject at different times. The design allowed assessment of whether improvement in a particular component of performance was a general outcome or exclusive to the subject for whom the goal attainment scaling procedure was implemented.

**Results:** In order to ensure that any performance differences that occurred in the post intervention phase were not simply a function of playing time, percentage changes were calculated for each of the four subjects. A mean value for playing time was calculated for the first eight games for the purposes of comparision with the second eight games. Each game involved two halves 20 min with the game clock stopping on the occasions that a substitution was permitted. No major percentage changes emerged between time on court over the first eight games and over the second eight games for any of the four subjects.

**Franklin A Lendeburg and Jack E Hewitt** published their paper in Research Quarterly, Vol. 36 No.2. Their Topic was Effect of an over sized Basketball on shooting Ability and Ball Handling.

This study attempted to discover if using a larger than regulation Basketball would have an effect on shooting ability and ball handling.
Twenty six experienced male basket ball players were tested on short shooting, foul shooting, passing and ball handling with the regulation basketball and with the experimented ball. The data were treated statistically and there were no significant difference between the two balls on short shooting foul shooting or dribbling. There was a significant difference between the experimental ball and the regulation ball on the passing test.

Conclusion:

1) Using a basketball that is 2 or heavier and 1 ¼ in large in circumference than a regulation basket ball causes no difference on shooting short shots and foul shots or on the dribble test.

2) The larger and heavier experimental basket ball significantly affects passing a ball against a wall as the test was conducted in this experiment.

3) In general it can be stated that an experimental basket ball that is only 2 or heavier and 1 ¼ in. in circumference larger would have no appreciable affect on the basket ball skills of shooting and ball handling.

4) It will be worthwhile to repeat this experiment with an experimental basketball that is considerably larger than a regulation basketball.
Theresa Anderson written and published his research paper entitle A study of the use of visual aids in Basket shooting.

In his study he has tried to determine whether or not any significant improvement was associated with the use of aids in visualization in the teaching of bank shots in basket shooting.

For solving this problem he used 132 girls of 10th and 11th standard of Lowa city.

He devided 132 girls in two groups in equal of 66 numbers the test cover 3 twelve half hour practice periods. The same test was given to each girl both at the beginning and close of the testing period. Three shooting areas were arbitrorially marked on the floor on each side of the basket.

After finding the result of the study he concluded his study like, from the size of the critical rations and from the size of the improvement, expressed in percentages, this study seem to indicate that the differences between the group which is used the visual aids, and the one that did not is significant. It would seen desirable to aid the beginners in basket shooting by adding the sports on the back board until he or she has achived a responsible proficiency in throwing baskets and has became able to visualize the proper places to hit the back board.

Chester. W. Buckly written an article on Mechanical analysis of the jump shot and published it in Atheleteice journal Octo, 1962.

He told in his article that, as is true of any basket ball shot should minimize arm action and accentuate writ movement. The mechanical advantage by using wrist rathere than arm action can be demonstrated

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through the use of levers. It is quite apparent by using wrist action, the player is able to increase the height of the shot and practically eliminate the possibility of the shot being blocked, in order to the tremendous force, an individual should have the force arm as long as possible if he is more interested in sport movement. The force arm should be actively short. By using wrist and when in the act of shooting, the start get away faster when arm movement is the reaction would be just apposite. The arc at which a ball travels in controloled by the wrist in the success of the shot is related angle at which it arrives at the back wrist movement is most important has been calculated that a ball travels with an arc less than 30 degree go through the basket cleanly.

When realising a ball for any shot which is directly at the basket, it is natural to put backspin on the ball. Backspin is caused by applying the force below the center of the ball. The backspin should be natural due to the follow through which is a continuation of the entire arm after the release in the direction of the basket. The spin serves two primary purposes; it helps the ball to maintain its direction by preventing it from drifting and it retards the balls rebound from the board. The angle of rebound becomes less than the angle of approach backspin reduces the speed of the ball thus adding to the possible its dropping through the basket than bounding away.


The purpose of his study was to assess the effect of yogic Asanas on range of movement at wrist, hip, knee and Ankle joints.
Materials and Methods:

The subjects for this study were selected from Arts and commerce college who were inter collegair level sportsman only 30 male students of 17 to 21 year ages were selected. Experimental matured was used far this study. Therefore subject were divided in equal two groups.

Measures:

Wrist (downward flexion) hip, knee and Ankle (Planar flexion) joints were measured with the heop of goniomaterin degree.

Selection of Asnas:

Asanas were selected to enhance stretch ability of muscles and for improving mobility of joints. For this with the help of expart opinion following Asanas were selecte like padmasana, Hulasana, Bhujangasana, Dhanurasana, pachima-uttan-asana chakrasana, Vajrasana.

The Training of experimental treatment was given in practice session for a period of 45 minutes with 5 P.M. to 5.45 P.M. from Monday to Saturday for the duration of 6 weeks. For the teaching purpose each Asana was explained and demonstrated before the students performed same. The same was supervised by the researcher himself. Correction and instruction were given in between succeeding asana.

Statistical Analysis:

Method was used to compare the means of both the groups for every variable level of significance was set at 0.05.
Result: In order to determine the significance of the differences in range of movement at wrist hip, knee, and Ankle joints, if any between the pre test and past test of experimental group was applied.

The result come forward that 2 revals that post training mean is higher than the pre-training mean of range of movement at wrist hip, knee and Ankle joints because all the calculated + values i.e. 12.27, 11.19, 9.94 and 12.66 respectively are greater than the tabulated + value of 2.145 for the 14 depress of freedom.

Discussion:

The significant movement at wrist, hip, knee and Anckle joint. This may be due to the fact that the load which was experienced by the subject in a yogic practice programme was adequate to produce significant improvement in range of movement.:

Conclusion:

Within the limitation of the present study and in the basis of findings it is concluded that yogic Asana are effective in improving the range of movement of different joints i.e. wrist, hip knee and Ankle.

After conclusion of the study he recommended that yogic Asana may form an important part of training program and for enhancing the range of movement of wrist, hip, knee and Ankle joints.

Similar study may be done selecting other variables such as shoulder, trunk etc.
Valdmir (1981) States in his research paper “Decision in the last minute ” that basket ball has become more and more simple, but the shooting percentage of the terms and individuals has reached a very high level up to 52-55% as seen in the European championship in June 1981. Research paper was published in international Basketball Journal in 1981.¹

Ray (1978) found that the increase in the number of points score per game and the increase of shooting percentage these days are considered to be the result of increase in the number of attempts.

Bunn (1964) remarked that the marked increase in scoring can be credited to the development of the highly potent weapon three point shooting.

Having reviewed whatever literate is available concerning three point plays, we have also reviewed findings related to shooting in general. Based on this, we can only hope that researchers in the near future will take up this area for study, as it open up vast avenues for interesting findings which should help to further the standard of the game.

He mentioned that the high arch is necessary in three point shooting accuracy and it comes when more power in wrist was there.

Conducted experiments in shooting from distance of 20 feet to correlate the accuracy of the shot with the angel of deviation from the basket. A deviation of 3 degree will be just Score a goal if the shot is neither long nor short. Such experiment published in his own book entitled sainfitic Primus or coaching in 1972

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Other studies find the corelation between shooting accuracy and training methods.

Minnol (1972) made his observations on shooting accuracy measure before and after weight training and find out that shooting accuracy defiantly develop by managing the weight training program at least 6 week period.

Coppedge and Berger (1968) also conducted an experiment with shooting accuracy and weight training and found that shooting and weight training helped improved shooting accuracy.

The three point field goal area rule was officially introduced from October 1st 1984. The only known study on the three point play was initiated by the Research committee of the N.C.A.A. Basket Ball rules committee. At their request, the southern conference conducted a season (1980-81) long experiment using the three point play from a distance of 22 feet from the centre of the basket.

Shooting play a key role in the winning of Basket ball matches. Shooting percentage are an important index of team performance.

Elizabeth M. Mortinez said about Basket ball shooting by following way. Shooting is a fundamental skill which is learned. In order to become a good shooter. A player should basic mechanics of the shot become aware of the basic shoot faults. The following shooting mated can be practiced by looking into a wall or a window of the house. Do not afraid to look at the wrist action and elbow. Through until a natural
release be entered this is a reason it is to shoot off a wall or backboard; ring for accuracy should not be the many objective until the smooth reuse has been learned.

The modern game of basketball, shooting would rate as one of the most important fundamentals a player should star teams with shorter players fervently fundamentals a player should star teams with shorter players fervently are able to defeat teams with players because of effective out shooting some teams with exer material have probability to effectively attack packed zone defenses. Any player possesses an excellent outside has a distinct advantage over anger player in an effort to make the thing squad.

**Barnes Mildred J.** Suggested some for developing the shooting accuracy. He explains that accuracy depends upon balance concentration, confidence and correct release shooting should concentrate on the target aim during the shot and after the balls has been released, shooters should not watch the air of the flight & which may cause disturbance in accuracy.

**Ebest and Cheatum** – Described the following basic and essential fundamental for good shooting in basketball.

1. Contacting the ball and relaxing the body.

2. Ability to concentrate.

3. Ability to aim at a specific target.

4. Positioning the ball.
5. Releasing the ball.

6. Follow-through.

7. Predetermining the flight of the ball.

He also advised the players to focus their eye-sight on the target that is to concentrate in one point.

**Jagger B** – Suggested some important points in shooting they are to relax to be a good balanced position to have the ball at chest height and from there take it directly up to the shooting position, to concentrate on the basket ring as the aiming point and to make an easy follow through.

**Strack** – Focused the attention to the mental side of a player while shooting, According to his view, the mental side of shooting is an equally important factor. We want our shooting to have a great deal of confidence in their shooting ability. We want them to develop a great deal of confidence in their own shooting and our coaches aid in every possible way not only in developing the physical side of shooting but also the mental confidence of the shooter.

**Dr. P. M. Keller** Studied on effect of weight of weight Training on Performance and Eight high school boys was investigated by him. Each subject had one to three seasons of experience in this event prior to the study. Three weeks before weight training the subjects high jumped until they were able to attain their previous best effort. The subjects then weight trained for eight weeks, three times weekly, on exercises
consisting of the high pull-curl, walking squat, half-bent rowing motion, sit-ups, high rapid dead lift, side bends, press on toes, and straddle hop. After the completion of training, the subjects' high jumping ability increased on the average of 3.35 inches. It was concluded by the investigator that weight training increased leg power.

Chui studied the effects of a systematic weight training program on athletic power. A control group and an experimental group trained three times a week for twelve weeks. Both groups participated in a similar program of physical education activities, but the experimental group also engaged in weight training. The criteria for athletic power were the standing Sargent Jumps, running Sargent Jumps, standing broad jump, eight and twelve pound shot put, and sixty yard dash. The results showed the weight trained group to be superior on all the criteria. It was concluded that weight training improved muscular power.

Zorbas and Karpovich studied the effect of weight training upon the speed of muscle contractions. Six hundred subjects were tested to determine how fast they could complete twenty-four rotary arm movements. Half the subjects had participated in weight training at least six months and the other half had not. Each subject was given two trials with a three-minute rest between trials. The best trial was taken as the score.

The weight trainers were found to be significantly faster than the subjects who had not trained with weights. The investigators concluded that the practice of weight training improved movement time. The effect
of increased strength on muscular coordination and speed of movement was studied by Masley,

**Hairabedian, and Donaldson** The control group consisted of twenty-four students registered in a volleyball class and fifteen students not registered for any physical education class.

The experimental group consisted of twenty-four students who trained with weights for six weeks, three times weekly. All groups were tested before and after six weeks on speed of movement, muscular coordination, and strength. Speed of movement was measured by recording the time a subject could rotate a wheel twenty-four revolutions with the arm. Muscular coordination was measured by coordinacing an eye stimulus with a muscular response, and strength was measured by the Rodger's Strength Index. The groups were equated on strength and speed but not on coordination. The results showed that weight training increased strength, speed, and coordination more than volleyball or inactivity. The investigator concluded that an increase in strength was apparently associated with increased muscular coordination and speed of movement. Garth (15) studied the effect of weight training on the vertical jump. Nineteen basketball players were measured in the vertical jump before and after a period of six weeks. During this period the subjects trained on the military press, curls, forward raise, lateral raise, and walking squat exercise. In addition, they performed twenty vertical jumps a day using only body weight. An Components was found of 2.47 inches with the right hand and 2.46 inches with the left hand. It was concluded by the investigator that weight training and/or twenty vertical jumps a day increased vertical jumping ability.
Baer determined the effects of static and dynamic strength training on strength, work capacity, and reaction time. Sixty-three subjects participated in a training program designed to increase the strength of the wrist flexors. A strain gauge was used to measure strength while work capacity was determined with an ergograph. An electronic device was used to measure reaction time. The results showed that strength training improved work capacity, reaction time, and strength significantly in all groups. It was concluded that weight training was effective for increasing performance in strength, work capacity, and reaction time.

The effect of increased strength in overcoming the handicaps of added body weight was studied by Mitchell (25). Fifty-six male subjects were tested before and after weight training for nine weeks. Ades et al. (2003) evaluated the value of resistance training on measures of physical performance in disabled older women with coronary heart disease (CHD). The study intervention consisted of a 6-month program of resistance training in a randomized controlled trial format. Training intensity was at 80% of the single-repetition maximal lift. Control patients performed light yoga and breathing Circuit trainings. Study participants included 42 women with CHD, all > or = 65 yr of age and community dwelling. Subjects were screened by questionnaire to have low self-reported physical function. The primary study measurements related to the performance of 16 household activities of the Continuous Scale Physical Functional Performance test (CSPFP). These ranged from dressing, to kitchen and cleaning activities, to carrying groceries and walking onto a bus with luggage, and a 6-min walk. Activities were measured in time to complete a task, weight carried during a task, or distance walked. Other measures included body composition, measures of aerobic fitness and strength, and questionnaire-based measures of physical function and
depression score. Results: Study groups were similar at baseline by age, aerobic capacity, strength, body composition, and in performing the CSPFP. After conditioning, 13 of 16 measured activities were performed more rapidly, or with increased weight carried, compared with the control group (all P < 0.05). Maximal power for activities that involved weight-bearing over a distance, increased by 40% (P < 0.05).

Disabled older women with CHD who participate in an intense resistance-training program improve physical capacity over a wide range of household physical activities. Benefits extend beyond strength-related activities, as endurance, balance, coordination, and flexibility all improved. Strength training should be considered an important component in the rehabilitation of older women with CHD.

**Blumenthal et. al. (1989)** evaluated the cardiovascular and behavioral adaptations associated with a 4-month program of aerobic Yoga and curling exercise training were examined in 101 older men and women (mean age = 67 years). Subjects were randomly assigned to an Aerobic Yoga and curling exercise training group, a Yoga and Flexibility control group, or a Waiting List control group. Prior to and following the 4-month program, subjects underwent comprehensive physiological and psychological evaluations. Physiological measures included measurement of blood pressure, lipids, bone density, and cardiorespiratory fitness including direct measurements of peak oxygen consumption (VO2) and anaerobic threshold. Psychological measures included measures of mood, psychiatric symptoms, and neuropsychological functioning. This study demonstrated that 4 months
of aerobic Yoga and curling exercise training produced an overall 11.6%.

Components in peak VO2 and a 13% increase in anaerobic threshold. In contrast, the Yoga and Waiting List control groups experienced no change in cardiorespiratory fitness.

Other favorable physiological changes observed among aerobic Yoga and curling exercise training participants included lower cholesterol levels, diastolic blood pressure levels, and for subjects at risk for bone fracture, a trend toward an increase in bone mineral content. Although few significant psychological changes could be attributed to aerobic Yoga and curling exercise training training, participants in the two active treatment groups perceived themselves as improving on a number of psychological and behavioral dimensions.

Bowman et al. (1997) examined the age-associated reduction in baroreflex sensitivity is modifiable by Yoga and curling exercise training. The effects of aerobic Yoga and curling exercise training and yoga, a non-aerobic control intervention, on the baroreflex of elderly persons was determined. Baroreflex sensitivity was quantified by the a-index, at high frequency (HF; 0.15–0.35 Hz, reflecting parasympathetic activity) and mid-frequency (MF; 0.05–0.15 Hz, reflecting sympathetic activity as well), derived from spectral and cross-spectral analysis of spontaneous fluctuations in heart rate and blood pressure. Twenty-six (10 women) sedentary, healthy, normotensive elderly (mean 68 years, range 62–81 years) subjects were studied. Fourteen (4 women) of the sedentary elderly subjects completed 6 weeks of aerobic training, while the other 12 (6 women) subjects completed 6 weeks of yoga. Heart rate decreased

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following yoga (69 ± 8 vs. 61 ± 7 min⁻¹, P<0.05) but not aerobic training (66 ± 8 vs. 63 ± 9 min⁻¹, P=0.29). VO2 max increased by 11% following yoga (P<0.01) and by 24% following aerobic training. Following yoga, aHF (8.0 ± 3.6 vs. 11.5 ± 5.2 ms mmHG⁻¹, P<0.01) but not aMF (6.5 ± 3.0 vs. 7.6 ± 2.8 ms mmHG⁻¹, P=0.29) increased. Short-duration aerobic training does not modify the a-index at aMF or aHF in healthy normotensive elderly subjects. aHF but not aMF increased following yoga, suggesting that these parameters are measuring distinct aspects of the baroreflex that are separately modifiable.

Clay et al. (2005) to determine the metabolic and heart rate (HR) responses of hatha yoga, 26 women (19-40 years old) performed a 30-minute hatha yoga routine of supine lying, sitting, and standing asanas (i.e., postures). Subjects followed identical videotaped sequences of hatha yoga asanas. Mean physiological responses were compared to the physiological responses of resting in a chair and walking on a treadmill at 93.86 m.min⁻¹ [3.5 miles per hour (mph)]. During the 30-minute hatha yoga routine, mean absolute oxygen consumption (VO₂), relative VO₂, percentage maximal oxygen consumption (%VO₂R), metabolic equivalents (METs), energy expenditure, HR, and percentage maximal heart rate (%MHR) were 0.45 L.min⁻¹, 7.59 ml.kg⁻¹.min⁻¹, 14.50%, 2.17 METs, 2.23 kcal.min⁻¹, 105.29 b.min⁻¹, and 56.89%, respectively. When compared to resting in a chair, hatha yoga required 114% greater O₂ (L.min⁻¹), 111% greater O₂(ml.kg⁻¹.min⁻¹), 4,294% greater %VO₂R, 111% greater METs, 108% greater kcal.min⁻¹, 24% greater HR, and 24% greater %MHR. When compared to walking at 93.86 m.min⁻¹, hatha yoga required 54% lower O₂(L.min⁻¹), 53% lower O₂(ml.kg⁻¹.min⁻¹), 68% lower %VO₂R, 53%
lower METs, 53% lower kcal.min(-1), 21% lower HR, and 21% lower %MHR. The hatha yoga routine in this study required 14.50% Vo(2)R, which can be considered a very light intensity and significantly lighter than 44.8% Vo(2)R for walking at 93.86 m.min(-1) (3.5 mph). The intensity of hatha yoga may be too low to provide a training stimulus for improving cardiovascular fitness. Although previous research suggests that hatha yoga is an acceptable form of physical activity for enhancing muscular fitness and flexibility, these data demonstrate that hatha yoga may have little, if any, cardiovascular benefit.

Cunningham, C., S. Brown, and J. C. Kaski (2001) studied on Chest pain with normal coronary angiograms is often associated with chronic sympathetic activation, anxiety, and depression, and is resistant to conventional antianginal treatment. The practice of Transcendental Meditation, a standard relaxation method for 3 months twice daily, significantly improved Yoga and curling exercise training tolerance, angina episodes, and quality of life in 9 women; the positive findings in this study warrant further research.

Swahney, R. C., et al. One hundred and nineteen patients of coronary artery disease (CAD) were registered for the study through March 1999. Out of these 119 patients, 70 were angiographically documented cases with superior vena cava (SVC), dicuspid valve defect (DVD) or tricuspid valve defect (TVD), and 49 had treadmill test (TMT) & echocardiographic evidence of CAD. They were selected based on well-defined inclusion and exclusion criteria. All had at least >70% stenosis in one of the major epicardial arteries. None of them was taking any lipid-lowering drug and had left ventricular ejection fraction of more
than 30%, without left ventricular failure. The life style intervention was
started with a seven-day stay at Global Hospital & Research Centre
(GHRC), Mount Abu. Detailed biochemical, cardiac, physiological,
psychological and hormonal investigations were carried out in these
patients before starting the intervention program. The noninvasive cardiac
investigations included ECG, TMT and echocardiography. The
physiological parameters like HR, BP, galvanic skin resistance, EEG and
HR variability were monitored using a computerized polygraphic
recording system. The psychological assessment included structural
interview, anger scale, self-rating anxiety, hostility and depression scale.
Anthropometric measurements like hip-to-waist ratio and hip-to-abdomen
ratio were also worked out. After basal investigations, subjects were
administered an intensive information, education and counseling program
about CAD and were explained how the adaptation to right life style can
prevent progression of the disease. They received a vegetarian diet of
1600-1800 Kcals./day. Patients were individually asked to Yoga and
curling exercise training according to their baseline TMT level.

Preliminary results from the study have suggested a marked
Components in cardiac function parameters within seven days of the
intervention program, which showed further Components when
reinforcement was done after six months of entering the study. The left
ventricular ejection fraction and Yoga and curling exercise training
tolerance (TMT) showed a significant Components in patients whose
adherence to the new life style was more than 80%. Both systolic as well
as diastolic blood pressure decreased significantly due to a consistent
decline in autonomic sympathetic control over the myocardium. Besides
causing a 10 to 20% decline in total cholesterol, low density lipoprotein
(LDL) and triglycerides levels, the high density lipoprotein (HDL) levels
showed a slight but definite increase over the basal values. The fasting insulin, glycosylated hemoglobin and glucose levels also showed a significant decrease suggesting a better glycemic control. Morning as well as evening cortisol levels also showed a 15% decline after six months of the lifestyle intervention schedule. URL: http://www.ccryum.org/index/htmail.

DiCarlo et al. (1995) studied on Cardiovascular, metabolic, and perceptual responses during a 32-minute treadmill walk (TW) at 4 mph were compared with those measured during a vigorous, standing-pose, hatha yoga [Iyengar-based] routine (YR). Subjects were six male and four female yoga practitioners age 38-47 years. The 32-minute YR consisted of a series of standing poses [Utthita Trikonasana, Virabhadrasana 2, Parivrtta Parsvakonasana, Virabhadrasana 1, and Parivrtta Ardha Chandrasana, with Tadasana performed between each pose] held for 40 s with 10 s for transitions. Heart rate (HR), blood pressure (BP), oxygen uptake (VO2), and rating of perceived exertion (RPE) were measure at 8, 16, 25, and 32 minutes. All comparisons between YR and TW were significantly different (p<0.05) except HR and RPE at 8 min. At 16, 24, and 32 minutes, both HR and RPE were higher during YR than TW (138, 139, 144 vs 117, 118, 120 beats/min; 15.4, 15.3, 15.9 vs 12.5, 12.7, 12.9). Blood pressures were higher during YR at all four time intervals (systolic 153, 148, 147, 147 vs 133, 131, 127, 130 mm Hg; diastolic 85, 93, 86, 89 vs 70, 70, 71, 68 mm Hg). Conversely, VO2 was higher during TW than YR at each time interval. Across the 32-minute session, mean energy expenditure was 34% VO2max for YR and 46% VO2max for TW. The elevated HR, BP, and RPE responses associated with YR vs TW can be attributed in large part to the static Yoga and curling excercise training.
components inherent in this type of yoga. Yet, the vigorous YR standing poses resulted in a lower metabolic demand than brisk walking (4.1 vs 5.4 METS). These findings can be used to better understand hatha yoga from the perspective of physiological responses and appropriate Yoga and curling exercise training prescription. multimodality natural medicine program on carotid atherosclerosis in older subjects: a pilot trial of Maharishi Vedic Medicine. *American Journal of Cardiology*, 15 Apr 2002, 89(8): 952-958. PMID: 11950434.

**Harinath (2004)** to evaluate effects of Hatha yoga and Omkar meditation on cardiorespiratory performance, psychologic profile, and melatonin secretion. Subjects and methods: 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 Circuit trainings for 40 minutes and slow running for 20 minutes during morning hours and played games for 60 minutes during evening hours daily for 3 months. Group 2 subjects practiced selected yogic asanas (postures) for 45 minutes and pranayama for 15 minutes during the morning, whereas during the evening hours these subjects performed preparatory yogic postures for 15 minutes, pranayama for 15 minutes, and meditation for 30 minutes daily, for 3 months. Orthostatic tolerance, heart rate, blood pressure, respiratory rate, dynamic lung function (such as forced vital capacity, forced expiratory volume in 1 second, forced expiratory volume percentage, peak expiratory flow rate, and maximum voluntary ventilation), and psychologic profile were measured before and after 3 months of yogic practices. Serial blood samples were drawn at various time intervals to study effects of these yogic practices and Omkar meditation on melatonin levels. Results: Yogic practices for 3 months resulted in an
in cardiorespiratory performance and psychologic profile. The plasma melatonin also showed an increase after three months of yogic practices. The systolic blood pressure, diastolic blood pressure, mean arterial pressure, and orthostatic tolerance did not show any significant correlation with plasma melatonin. However, the maximum night time melatonin levels in yoga group showed a significant correlation ($r = 0.71$, $p < 0.05$) with well-being score. Conclusion: These observations suggest that yogic practices can be used as psychophysiologic stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being.

**Konar (2000)** studied on Sarvangasana (SVGN) is a head-down-body-up postural Yoga and curling exercise training in a ‘negative g’ condition. Though highly recommended as one of the three best of all the asanas it has not yet been studied for its very obvious effects on the cardiovascular (CV) functions. This paper reports the results of the first systematic investigation on SVGN employing echocardiographic analysis in eight healthy male subjects before and after a practice of this asana twice daily for two weeks. The resting heart rate (HR) and left ventricular end-diastolic volume (LVEDV) were significantly reduced ($P < 0.02$, $P < 0.01$ respectively) after practicing this asana. A tendency toward a mild regression of the left ventricular mass was noticed, though it was not statistically significant. The CV responses to acute 45 degrees head-down tilt (HDT) in a tilt table was not altered after practicing this asana. Also there was no orthostatic intolerance during the 3-5 min period of 70 degrees head-up tilt (HUT). These results strongly indicate that further studies of this asana performed for a longer period is most likely to yield very significant observations of applied value.

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La Forge, Ralph (1997) studied on health promotion programs have generated many worthwhile psychologic and physiologic benefits but frequently with less than optimal long-term adherence. Incorporating approaches such as mind-body Yoga and curling exercise training with existing health promotion and cardiac rehabilitation services can improve self-efficacy and long-term adherence to healthy behaviors as well as improve personal stress management skills.

Mind-body Yoga and curling exercise training couples muscular activity with an internally directed focus so that the participant produces a temporary self-contemplative mental state. This internal focus is in contrast to conventional body-centered aerobic and muscular fitness Yoga and curling exercise training in which there is little or no mindful component. Research on mind-body Yoga and curling exercise training programs such as yoga and tai chi reveal they have significant mental and physical value. There also are numerous primary and secondary preventive indications for cardiovascular disease in which mind-body Yoga and curling exercise training can play a primary or complementary role. Mind-body Yoga and curling exercise training programs will be a welcome and necessary addition to evolving disease management models that focus on self-care and decreased health care use.

Madanmohan et al. (2002) studied on Indian culture stresses the importance of direction during performance of daily activities. Some yoga teachers prescribe that yogic relaxation and polarity practices must be done while lying with head towards north in order to align oneself with the earth’s electromagnetic field. There is some evidence that earth’s magnetic field influences physiological functions. Hence, the present study was undertaken to see whether head direction has any effect on

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heart rate (HR) and blood pressure during supine rest. 43 normal healthy school children were recruited and their recordings were taken after 5 minutes of supine rest. The subjects were randomly assigned to lie with their head towards north, east, south and west directions on four different days. HR and blood pressure were recorded at the end of 5 minutes of supine rest. HR was lowest in north and highest in south, the difference being statistically significant by students’ paired “t” test. Systolic pressure was lowest in the north and significantly higher in the west. Lying supine with head towards north had the lowest rate-pressure-product as compared to the west. Our study demonstrates that lying supine with head in different directions has a definite effect on the HR and blood pressure. Further studies in different age groups and in hypertensive patients may help in understanding the mechanisms and implications of this phenomenon.

**Udupa (2004)** study reports the effects of yoga training on cardiovascular response to Yoga and curling exercise training and the time course of recovery after the Circuit training. Cardiovascular response to Yoga and curling exercise training was determined by Harvard step test using a platform of 45 cm height. The subjects were asked to step up and down the platform at a rate of 30/min for a total duration of 5 min or until fatigue, whichever was earlier. Heart rate (HR) and blood pressure response to Yoga and curling exercise training were measured in supine position before Yoga and curling exercise training and at 1, 2, 3, 4, 5, 7 and 10 minutes after the Circuit training. Rate-pressure product \[ RPP = (HR \times SP)/100 \] and double product \( DoP = HR \times MP \), which are indices of work done by the heart were also calculated. Yoga and curling exercise training produced a significant increase in
HR, systolic pressure, RPP & DoP and a significant decrease in diastolic pressure. After two months of yoga training, Circuit training-induced changes in these parameters were significantly reduced. It is concluded that after yoga training a given level of Yoga and curling exercise training leads to a milder cardiovascular response, suggesting better Yoga and curling exercise training tolerance.

Mahajan et al. (1999) studied the effect of yogic lifestyle on the lipid status was studied in angina patients and normal subjects with risk factors of coronary artery disease. The parameters included the body weight, estimation of serum cholesterol, triglycerides, HDL, LDL and the cholesterol - HDL ratio. A baseline evaluation was done and then the angina patients and risk factors subjects were randomly assigned as control (n = 41) and intervention (yoga) group (n = 52). Lifestyle advice was given to both the groups. An integrated course of yoga training was given for four days followed by practice at home. Serial evaluation of both the groups was done at four, 10 and 14 weeks. Dyslipidemia was a constant feature in all cases. An inconsistent pattern of change was observed in the control group of angina (n = 18) and risk factor subjects (n = 23). The subjects practising yoga showed a regular decrease in all lipid parameters except HDL. The effect started from four weeks and lasted for 14 weeks. Thus, the effect of yogic lifestyle on some of the modifiable risk factors could probably explain the preventive and therapeutic beneficial effect observed in coronary artery disease.
Manjunath, N. K., and Shirley Telles (2003) to assess heart rate variability (HRV) along with non-specific autonomic measures (used in earlier studies), before and after two minutes of the headstand. (2) To compare changes in two categories of subjects, i.e., those who practiced the headstand in a traditional way (without any support) and those who used the support of the wall (a present day adaptation). The subjects were forty male volunteers (age range 19 to 36 years), with twenty subjects under each category.

The following changes were significant after the practice, compared to values at baseline.

(i) Both categories had an increase in the power of the low frequency component (LF) and a decrease in the high frequency component (HF) of the HRV spectrum, increased LF/HF ratio, and decreased heart rate.

(ii) Subjects who practiced the headstand with the support of a wall showed reduced finger plethysmogram amplitude suggesting increased sympathetic vasomotor tone.

(iii) Practicing the headstand without support was associated with an increase in the skin conductance level, suggestive of increased sympathetic sudomotor tone. Hence, both categories showed similar changes in the HRV components though changes in sympathetic vasomotor and sudomotor activity were different. These changes suggest sympathetic activation, irrespective of the method of practice. 38 39
Mohan et.al.(1983) study was conducted in trained (n=7) and untrained (n=7) volunteers to determine the effect of savitri pranayam and shavasan on O2 consumption, heart rate and blood pressure. In trained subjects we found a consistent and significant (p<0.01) reduction in O2 consumption within a few minutes of starting savitri pranayam.

During shavasan, there was significant reduction in O2 consumption (p<0.05), heart rate (p<0.001) and diastolic blood pressure (p<0.05). In untrained subjects, the changes in above mentioned parameters were statistically insignificant.

Raub (2002) suggest that Yoga has become increasingly popular in Western cultures as a means of Yoga and curling exercise training and fitness training; however, it is still depicted as trendy as evidenced by an April 2001 Time magazine cover story on “The Power of Yoga.” There is a need to have 47 yoga better recognized by the health care community as a complement to conventional medical care. Over the last 10 years, a growing number of research studies have shown that the practice of Hatha Yoga can improve strength and flexibility, and may help control such physiological Componentss as blood pressure, respiration and heart rate, and metabolic rate to improve overall Yoga and curling exercise training capacity. This review presents a summary of medically substantiated information about the health benefits of yoga for healthy people and for people compromised by musculoskeletal and cardiopulmonary disease.
Rzesutko et.al. (2002) Power yoga is a modernized form of Ashtanga Vinyasa yoga [and] has been suggested as a form of aerobic conditioning. Purpose: The purpose of this study was to determine whether participants in a beginning power yoga class could attain a level of intensity to achieve ACSM recommended target heart rate (THR) levels (55-90% HRmax) for aerobic training. Methods: Thirteen active college aged individuals with no prior yoga experience participated in the study. Participants met for three consecutive 45-minute testing sessions with a 48-hour rest interval between sessions. Each session consisted of six segments: 10 min rest, 5 min deep breathing, 5 min warm-up, 20 min work, 10 min deep-breathing, and 5 min final relaxation. Heart rate and rating of 48 perceived exertion (RPE) was obtained every 5 minutes. Componentss of interested included time to achievement of THR level, consistency of heart rates over the initial 3 power yoga sessions, ability to sustain THR levels, and correlation of perceived exertion (Borg 6-20 scale) to heart rate levels. Results: Time to achievement of THR levels varied among participants but there was no significant difference (p = .05) within a participant across sessions (power=.145). The amount of time participants were in the target heart rate zone during the 20 minute work segment varied but there was no significant difference (p =.05) within a participant across sessions (power = .48). Heart rate and perceived exertion during the work segment showed poor correlation (r < 0.58) in each of the three sessions. Conclusion: The results indicate that power yoga does not consistently provide heart rate intensities that meet ACSM recommendations for aerobic training in beginning power yoga participants. In addition the use of perceived exertion during power yoga does not appear to be an accurate correlation with heart rate. Hannover Medical University in Hannover, Germany, investigated some of the effects of a comprehensive, residential three-month kriya yoga training
program on cardiovascular risk factors in 106 healthy adults (58 men and 48 women ages 18-64 years, mean age = 29.6 years). Kriya yoga is an advanced tantric meditation process combining physical and mental techniques; sessions last four hours or longer. The yoga program, which took place at the Scandinavian Yoga and Meditation School in Ha, Sweden, consisted of three parts: During the first month, subjects practiced traditional yoga (daily hatha yoga Circuit trainings, breathing techniques, deep relaxation and meditation). In the second month, they learned kriya yoga. In the final month, they practiced kriya yoga daily, along with other yoga techniques and advanced meditations. Practical work in the school's kitchen, garden, fields and woods constituted an essential part of the training. Throughout the program, participants adhered to a low-fat (23% fat) vegetarian diet with no alcohol or caffeine. Pre- and postlaboratory assessments included blood lipids and lipoproteins, complete blood counts, fibrinogen (a plasma protein that contributes to the formation of blood clots), urinary and serum hormone levels, stress reactivity and blood pressure. The subjects were compared to control groups living their normal lives in Hannover; subjects and controls were matched for age, gender and respective initial risk factor levels.

The subjects lost an average of 5.7 kilograms and reduced their body mass index (BMI) by 1.88. Men experienced significant reductions in total serum cholesterol (from 181 to 166 milligrams per deciliter [mg/dl]), LDL cholesterol (from 117 to 102 mg/dl) and LDL- to-HDL ratio (from 2.7 to 2.2) (p [less than] 0.001 in each category). Reductions in these categories were not significant for women, whose initial levels were lower than the men's. HDL cholesterol did not change significantly in men or women. In the 15 participants whose HDL was initially [less
than] 35 mg/dl, however, HDL did increase significantly (from 30 to 40 mg/dl, p [less than] 0.001). Compared to the matched controls, male and female yoga participants had, after three months, significantly reduced their fibrinogen levels (decreasing the risk of blood clots) (p = 0.04). Blood pressure and heart rate dropped significantly during the course, with blood pressure Componentss being more pronounced (decreasing from 150/82 to 123/69) in those with initial systolic blood pressure levels [greater than or equal to] 140 millimeters of mercury (both p [lesser than] 0.000 1). Serum testosterone levels and urinary excretions of adrenaline, noradrenaline, dopamine and aldosterone all fell significantly in the study group compared to the control group. Schmidt and his fellow researchers concluded that commitment to intensive yoga therapy can significantly reduce cardiovascular risk factors, especially in individuals with increased risk factor levels, such as elevated BMI, cholesterol, blood pressure and fibrinogen. Comments: The results of this study were not entirely unexpected considering the intensive and residential nature of the intervention. Nonetheless, reductions in total cholesterol, LDL cholesterol and blood pressure were substantial. Such clinical results rival those attained by many drugs prescribed for lowering lipid and blood pressure levels. The challenge for fitness and health promotion professionals as lifestyle-change agents is knowing how to implement effective strategies to foster lifelong behavior change. Finally, it is noteworthy that, as was the case in this program, yoga therapy is often far more comprehensive than mere Yoga and curling exercise training poses.
Schneider et.al. (2005) studied on Psychosocial stress contributes to high blood pressure and subsequent cardiovascular morbidity and mortality. Previous controlled studies have associated decreasing stress with the Transcendental Meditation (TM) program with lower blood pressure. The objective of the present study was to evaluate, over the long term, all-cause and cause-specific mortality in older subjects who had high blood pressure and who participated in randomized controlled trials that included the TM program and other behavioral stress-decreasing interventions. Patient data were pooled from 2 published randomized controlled trials that compared TM, other behavioral interventions, and usual therapy for high blood pressure. There were 202 subjects, including 77 whites (mean age 81 years) and 125 African-American (mean age 66 years) men and women. In these studies, average baseline blood pressure was in the prehypertensive or stage-I hypertension range. Follow-up of vital status and cause of death over a maximum of 18.8 years was determined from the National Death Index. Survival analysis was used to compare intervention groups on mortality rates after adjusting for study location. Mean follow-up was 7.6 ± 3.5 years. Compared with combined controls, the TM group showed a 23% decrease in the primary outcome of all-cause mortality after maximum follow-up (relative risk 0.77, p = 0.039). Secondary analyses showed a 30% decrease in the rate of cardiovascular mortality (relative risk 0.70, p = 0.045) and a 49% decrease in the rate of mortality due to cancer (relative risk 0.49, p = 0.16) in the TM group compared with combined controls. These results suggest that a specific stress-decreasing approach used in the prevention and control of high blood pressure, such as the TM program, may contribute to decreased mortality from all causes and cardiovascular disease in older subjects who have systemic hypertension. Problems with this study as reported by Judy Foreman, “Does meditation offer any
health benefits?" The Boston Globe, 3 May 2005: “The study, conducted by Dr. Robert H. Schneider, director of the Institute for Natural Medicine and Prevention at the Maharishi University of Management in Fairfield, Iowa, pooled data on 202 mildly hypertensive people from two previous, randomized, controlled studies published in 1989 and 1995. Those studies, said Schneider, showed that Transcendental Meditation, a form of meditation in which a person is given a ‘mantra’ by a teacher and trained to use the technique to quiet the mind, lowered blood pressure after three to four months if done for 20 minutes twice a day. “In 2001, Schneider’s team looked at death records from the National Center for Health Statistics for the participants in these studies, who were interviewed an average of 7.6 years earlier. The researchers found the participants were more likely to be alive if they had practiced TM in the original studies. But—and it is a huge ‘but’—the samples were quite small and researchers had no way of knowing whether the meditators kept meditating after the initial studies.”

Nidich et al. (1998) Oxidative stress or free radical activity may contribute to the pathophysiology of atherosclerosis and other chronic diseases associated with aging.

Because psychosocial stress has been shown to increase oxidative stress, we conducted an exploratory study to investigate the effects of stress reduction with the Transcendental Meditation program on serum lipid peroxide levels in elderly subjects.
Method: Forty-one normally healthy subjects (aged 56 to 74 years, average 67 years) were recruited from the same Midwest city. Eighteen were long-term practitioners of the TM program (average 16.5 years). Twenty-three controls were not practicing a formal stress management technique. Venous blood samples were analyzed for lipid peroxides by the TBARS assay. A dietary questionnaire was used to assess fat intake, red meat consumption, antioxidant vitamin supplementation, and smoking. Differences between groups and subgroups were analyzed by t test, and correlations. RESULTS: Significantly lower serum levels of lipid peroxides were found in the TM practitioners compared with controls (-15%, p = .026). No significant differences were found between groups on smoking, fat intake, or vitamin supplementation. TM practitioners also had lower red meat consumption but matched subgroup analysis and partial correlations did not confirm a relationship between red meat intake and lipid peroxide levels.

Conclusion: These preliminary findings suggest that lower serum lipid peroxide levels may be associated with stress reduction using the Transcendental Meditation technique. Prospective controlled trials are needed to confirm that this effect is because of TM practice rather than other lifestyle factors, such as diet.

Sinha et al. (2004) study was undertaken to observe the energy cost and different cardiorespiratory changes during the practice of surya-namaskara. Twenty-one male volunteers from the Indian Army practiced selected yogic Circuit trainings six days a week for three months. The practice schedule consisted of Hatha-Yoga ásanas (28 min), prânâyâma (10.5 min), and meditation (5 min). Subjects first practiced kapâla-bhâti prânâyâma for 2 min, then yoga-mudrâ for 2 min; after that they rested...
until oxygen consumption and heart rate (HR) came to resting value. Subjects subsequently performed SN for 3 min 40 sec on average. After three months of training, subjects performed the entire yogic practice schedule in the laboratory, and measurements were taken. Their pulmonary ventilation, carbon dioxide output, oxygen consumption, HR, and other cardiorespiratory parameters were measured during the actual practice of SN. Oxygen consumption was highest in the eighth posture (1.22+/-.073 1 min(-1)) and lowest in the first posture (0.35+/-.02 1 min(-1)). Total energy cost throughout the practice of SN was 13.91 kcal and at an average of 3.79 kcal/min. During practice, the highest HR was 101+/-13.5 bpm. As an aerobic Yoga and curling excercise training SN seems to be ideal, as it involves both static stretching and the slow dynamic component of Yoga and curling excercise training with optimal stress on the cardiorespiratory system.

Blumenthal, J. A., et al. Stress management and Yoga and curling excercise training training in cardiac patients with myocardial ischemia: Effects on prognosis and evaluation of mechanisms From an article by David S. Sobel, M.D., entitled “Reducing Stress Reduces Heart Disease” (http://healthy.net/asp/templates/column.asp?PageType=Column&id=19): “[This study] found that relaxation, taming hostility, and helping people change the way they look at life’s challenges can reduce their risk of having further heart problems by 75% compared to people given only usual medical care and medications. Reducing stress proved even more beneficial than getting Circuit training. “In this study, 107 heart patients were randomly divided into three groups. The control group of forty patients received usual medical care. Another 34 engaged in a vigorous Yoga and curling excercise training program for 35 minutes three times a
week for 16 weeks in addition to their usual medical care. And 33 patients along with their usual care from physicians also participated in a stress management program that included: Weekly group sessions, educational information on heart disease and stress, and muscle relaxation practice and biofeedback. Patients were taught skills to monitor automatic irrational thought patterns and to develop alternative interpretations of situations and thought patterns. They were also instructed how to recognize signs of stress and manage moods such as anger and depression. “The patients’ medical records were tracked for the next two to five years for heart attacks, bypass surgery, and angioplasty. In the control group that received standard medical care, 30% had additional heart trouble compared to 21% in the Yoga and curling exercise training group (not significantly different from usual care). But the stress management group showed a dramatic difference—only 10% had further heart problems. This translates into roughly one-quarter the cardiac risk compared to those not receiving the additional psychological skill training. The stress management training also resulted in lower levels of psychological distress, less hostility, and fewer episodes of ischemic chest pain. If a new drug produced the same 75% reduction in cardiac risk as stress management, it would be headlines and rapidly prescribed by physicians . . .”

S. Grant et. al., (1992) studied on the effects of a 30-week university fitness program on health-related fitness Componentss. Twenty-one male Circuit trainings, aged 37.0(30.3) years (mean (S.D.); range 21-58), and 22 male controls, aged 38.6(7.9) years (mean(S.D.); range 17-54), volunteered to take part. Two sample t-tests and 95% confidence intervals were used to determine if the Yoga and curling exercise training group demonstrated a greater average Components than
the control group and the average Components in both groups separately. The Yoga and curling exercise training group showed a greater average Components over the controls from Test 1 (before fitness programme) to Test 2 (after) in the following: steady-state heart rate (beats min-1) 95% confidence intervals (-7.8, -16.2); predicted VO2 max (ml kg-1 min-1): 95% confidence intervals (3.2, 6.6); sit-ups (repetitions): 95% confidence intervals (3.1, 7.0); flexibility (cm): 95% confidence intervals (3.3, 6.9).

There was no significant difference between the Yoga and curling exercise training group and control group in body weight, percentage body fat, blood pressure, total plasma cholesterol, high-density lipoprotein and triglycerides. The Yoga and curling exercise training program improved aerobic fitness, local muscular endurance and flexibility. However, the increase in aerobic fitness did not coincide with beneficial changes in the coronary risk profile.

Spanos K. et. al., (2007), conducted the study “the effect of two Iso-tonic and Iso-metric Circuit trainings programs in muscular strength and muscular endurance of male adults”. The purpose of the study was to determine the effect of two training programs and to compare the changes that occurred in maximum strength (1 RM) and the muscular endurance in three Circuit trainings: bench press, frontal pull downs and squat. Participants were 18 average trained and healthy men 20-30 years (M=24.3, SD=0.6) and they were randomly divided into two groups. One group executed circular training (CT, N=9) while the other group (DMG, N=9) was distributed in muscular group training. The total volume and the intensity of training were the same in both groups. The CT group trained 3 times per week accomplishing 1 Yoga and curling exercise training of 3 sets for each muscular group of the top part of the body and
two Circuit trainings for the legs. The DMG group performed 3 Circuit trainings of 3 sets for each muscular group. Measurements of maximum strength and muscular endurance were made before the beginning of the program and 12 weeks after the training. The results showed that the two groups presented significant Components in maximum strength (1 RM) without significant differences in either of the two methods. In muscular endurance the DMG group was better in most Circuit trainings, but this increase was not significant. Furthermore it was concluded that when the total volume and the intensity of training were the same, the circular training and the training which was distributed in muscular groups, increased the maximum strength equally. Regarding muscular endurance it appeared that the results were better when the training was distributed.

_Takahashi et. al., (2008)_ conducted the study, “effects of Iso-tonic and Iso-metric Circuit trainings on physical fitness muscle strength and natural killer cell activity (NKCA) in female university students”. The purpose of the study was to determine the effect of Iso-tonic and Iso-metric Circuit trainings on natural killer cell activity and its health benefits in young female university students. The 22 non athlete female students volunteered participated in the study and the age ranged 19.8+/- 21.3 years. The subjects while divided into three groups. 6 subjects in A group that carried out Iso-tonic and Iso-metric Circuit trainings for 2 to 3 times week, 6 subjects in B group carried out resistance Yoga and curling excercise training 3 to 4 times a week and remaining 30 subjects comprised the controlled group. The A & B groups carried out resistance Yoga and curling excercise training for both upper and lower body parts using ankle and wrist weights for 8 week blood samples were obtain from subjects to determine NKCA. Physical fitness test and
muscular strength test were conduct to assess the strength, muscular endurance and flexibility. The results showed that there was significant Components in NKCA in B group and no significant Components in NKCA in A and C group. An Components in physical fitness and muscular strength was observed in A group and B group. It was concluded that Iso-tonic and Iso-metric Circuit trainings improved the physical fitness, muscular strength and NKCA in young female subjects.

Anderson T., and Kearney J.T. (1982), investigated the “Effects of three Iso-tonic and Iso-metric Circuit trainings programs on muscular strength and absolute relative endurance”. The purpose of the study were to determine the effects of three Iso-tonic and Iso-metric Circuit trainings programs on male college students' muscular strength and absolute and relative muscular endurance. Results show that human skeletal muscle makes both general and specific adaptations to a training stimulus, and that the balance of these adaptations is to some extent dependent upon the intensity and duration of the training protocol use Lippincott William and Wilkins (1994), “Strength/Endurance Effects from Three Iso-tonic and Iso-metric Circuit trainings Protocols with Women”. Fifty college women were randomly assigned to one of three Iso-tonic and Iso-metric Circuit trainings protocols that employed progressive resistance with high resistance/low repetitions (HRLR), medium resistance/medium repetitions (MRMR), and low resistance/high repetitions (LRHR). The three groups trained on the same resistance Circuit trainings for 9 weeks at 3 sets of 6 to 8 RM, 2 sets of 15 to 20 RM, and 1 set of 30 to 40 RM, respectively. Training included free weights and multi station equipment. The 1-RM technique was used for strength testing, and muscular endurance tests consisted of maximum

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repetitions either at a designated resistance or at a percentage of 1-RM. There were significant pre/post strength increases in both upper and lower body tests, but no significant post-treatment difference in muscular strength among the three protocols. Absolute muscular endurance increased significantly on 4 of 6 pre/post comparisons, while relative endurance increased significantly on only 4 of 12 comparisons. HRLR training yielded greater strength gains. LRHR training generally produced greater muscular endurance gains, and the percentage increase in absolute endurance was approximately twice the increase in strength for all groups. Lower body gains in both strength and endurance were greater than upper body gains.

Joanie L., et. al., investigated “Effect of Yoga and curling exercise training on physical fitness in type 2nd diabetes mellitus” the purpose was to evaluate the effects of aerobic Yoga and curling exercise training (A- group), Resistance Yoga and curling exercise training (R- Group) combined aerobic & Iso-tonic and Iso-metric Circuit trainingsgroup (A+R Group) & sedentary lifestyle (C group) on cardio respiratory fitness & muscular strength in individuals with T2 DM. The 251 subjects were selected & randomly allocated to A, R, A + R & C group. The duration of training program was 6 months. The vo2 max work load & trade mill time will determine after maximal Circuit training. The muscular strength was measured as the 8 reputation maximum on leg press; bench press & seated row response were compared between younger (aged 39 to 54 years) & older (aged 55 to 78 years) adults & between sexes. The result showed vo2 max improved by 1.73 & 193ml o2 kg-1 min-1 with A & A+R , respectively, compared with C( P<0.05) strength important were significant after A+R & R on
the leg press (A+R : 48%, R: 65%) bench press (A+R 38%, R: 57%) and seated or (A+R : 33%, R: 41%, P< 0.05). There were no effects of age & sex on the training performance outcomes, but there was tendency for older participates to increase vo2 max more. Ut was concluded that combined training did not provide additional benefits in younger subjects compared with aerobic & Iso-tonic and Iso-metric Circuit trainingsalone in older subjects there was a trend to greater aerobic fitness gains with A+R verses A alone.

Starkey, et. al., (1996), conducted the “effect of Isi-tonic and Iso-metric Yoga and curling excercise training training volume on strength and muscle thickness”. Study was to determine the effects of different volumes of high-intensity Iso-tonic and Iso-metric Circuit trainingson isometric torque and muscle thickness. Training was conducted three times per week using one set (low volume, EX-1, N = 18) or three sets (high volume, EX-3, N= 20) of dynamic Components resistance Circuit training. Ten subjects acted as non training controls (CONT). Bilateral knee extension (KEXT) and flexion(KFLEX) Yoga and curling excercise training was performed to fatigue within 8-12 repetitions for 14 wk. Maximal isometric KEXT and KFLEX torque was tested at 6°, 24°, 42°, 60°, 78°, 96°, and 308° of KFLEX using a Med X (Ocala, FL) KEXT/KFLEX ergo meter. The anterior (ANT), lateral (LAT), and posterior (POST) right thigh, the medialis muscle (MED), and the lateralise muscle (LATER) were assessed for thickness by B-mode ultrasound (ULTRA). Both training groups improved torque output at most angles, but there was no difference between EX-1 and EX-3 (P ≥ 0.05). ULTRA detected increases in muscle thickness for EX-1 at 60% LAT and 40% and 60% POST. EX-3 increased muscle thickness at the MED, and 40% and 60% POST. In conclusion, one set of high-intensity
Iso-tonic and Iso-metric Circuit trainings was as effective as three sets for increasing KEXT and KFLEX isometric torque and muscle thickness in previously untrained adults.

Takahashi et. al., (2007), conducted the study, “effects of Iso-tonic and Iso-metric Yoga and curling exercise training son physical fitness muscle strength and natural killer cell activity (NKCA) in female university students”. The purpose of the study was to determine the effect of Iso-tonic and Iso-metric Yoga and curling exercise training so natural killer cell activity and its health benefits in young female university students. The 22 non athlete female students volunteered participated in the study and the age ranged 19.8 +/- 21.3 years. The subjects while divided into three groups. 6 subjects in A group that carried out Iso-tonic and Iso-metric Circuit trainings for 2 to 3 times week, 6 subjects in B group carried out resistance Yoga and curling exercise training 3 to 4 times a week and remaining 30 subjects comprised the controlled group. The A & B groups carried out resistance Yoga and curling exercise training training for both upper and lower body parts using ankle and wrist weights for 8 week blood samples were obtain from subjects to determine NKCA. Physical fitness test and muscular strength test were conduct to assess the strength, muscular endurance and flexibility. The results showed that there was significant Components in NKCA in B group and no significant Components in NKCA in A and C group. An Components in physical fitness and muscular strength was observed in A group and B group. It was concluded that Iso-tonic and Iso-metric Circuit trainings improved the physical fitness, muscular strength and NKCA in young female subjects.
Muller and Rohmert conducted an investigation of the relationship between work load, duration of contraction, and strength increase in static training. They found: (1) A greater rate of increase in strength is brought about by a larger ration between static load and the subject’s initial maximal force of the contraction. (2) When muscular contractions were below a certain force level, no training effects take place. (3) The longer the contraction, the sooner the subject reached his theoretical maximal strength asymptote. (4) Increases in strength were not enhanced by repeating a short maximal contraction several times a day. A study by Marley (27) used three groups of twelve subjects each to compare the effectiveness of isometric and isotonic training for the acquisition of strength. The isometric group trained for ten weeks by exercising the elbow flexor muscles. It was found that the isometric circuit trainings were effective in developing strength.

Murphy - study was conducted to determine the effect of isometric and isotonic Yoga and curling exercise training on two factors of motor performance—measured pounds of tension and rotary force or torque. Seventy-two subjects were placed into three groups—a control group, a static Yoga and curling exercise training group, and a dynamic Yoga and curling exercise training group. The static test was an isometric contraction which was measured in pounds of tension exerted by the knee extensor muscles. Isometric knee extension circuit trainings were used three days a week for nine weeks supplementing the subjects’ regular physical education classes. It was found that both experimental groups made gains in strength beyond the 0.08 confidence level over the control group.
Strength, endurance, and anthropometric tests were administered before and after a seven-week isometric training program in a study by Ward (46). Seven six male subjects were equated on the basis of the initial strength test and divided into three groups. Subjects in two of the weight training classes trained with isometric Circuit trainings involving the neck, shoulder, arm, thigh, and lower leg areas. The isometric Yoga and curling exercise training group showed a significant gain in strength in these areas. Two contraction training methods were utilized in a study conducted by Meadows (30) to determine if significant components in strength would also improve the speed and force in the offensive football charge, and in the static and dynamic strength. Three groups of twenty-eight subjects each were initially tested for strength as measured by the hand grip, back and leg lift, chins, and dips. The isometric group participated in a ten-week training program exercising three times a week by performing static pulls in the five testing positions. Using the analysis of co-variance, the isometric group showed significant gains in number of dips (.05 level of confidence) and in the number of leg lifts and chins (.01 level of confidence). Isometric training also yielded significant gains in speed and force of the football charge. In a study by Martin, forty-one freshman and sophomore students participated in an eight-week, three-days-a-week, isometric training program. Subjects were pre-tested and post-tested using a cable densitometer. It was found that the group training isometrically gained significantly in strength in forearm flexion and lower leg flexion where training had occurred.
Burkhardt, twenty-four high school football players were divided into two groups: one group used six-second maximal isometric contractions and the other group trained with an isotonic Yoga and curling exercise training program. The subjects trained three days a week for ten weeks, using the biceps brachi muscle. To test for strength, the cable densitometer was used. It was found that both the isometric and isotonic group gained significantly in strength at the .05 level of confidence. A study by chi (9) showed significant gains in strength were accomplished by isometric training. Subjects in this study trained three days a week for nine weeks. In a study by Brigham (7), twenty male subjects were randomly selected and the strength of the triceps muscle was measured by an adapted aircraft densitometer before and after a six-week training period. The isometric Yoga and curling exercise training group performed three sets of ten maximal contractions. Each contraction was held for ten seconds with a five-second rest period between each contraction. It was found that isometric training brought about significant gains in strength in the triceps muscle beyond the 0.05 level of confidence. In a study by Williamson (50), one hundred tenth-grade boys were randomly assigned to a control group or to one of three Yoga and curling exercise training groups. The Yoga and curling exercise training groups trained daily with either one, ten, or twenty maximal six-second isometric contractions. The subjects were trained on a modified quadriceps table and were tested with the cable tension meter. There were significant increases in strength of the knee extensors by the three isometric Yoga and curling exercise training groups, but the difference between the groups was not statistically significant. A study to investigate the effects of isometric and isotonic Yoga and curling exercise training was done by Mathews (29) using 120 male students as subjects. Sixty of the subjects were placed in the isometric training unit. This unit was then divided into four groups of
fifteen subjects each. Each of these groups Circuit trainingd either two, three, four, or five times a week for four weeks. The training program consisted of three consecutive six-second maximum pulls against a stationary resistance. The results of the isometric training indicated that strength changes occurred regardless of the Yoga and curling excercise training frequency. It was found that all isometric training groups gained significantly in strength.

**Armstrong** Thirty-three college freshman female subjects participated in an Yoga and curling excercise training program for six week, five days a week. The subjects performed two different isometric Circuit trainings daily: six-second maximal contractions of the muscles of the abdominal, gluteal and thigh regions; and one six-second contraction of the muscles or the right hand and forearm. Analysis of data revealed significant increases in strength of right grip measurements only.

**Larsen** was undertaken to compare the strength ability effectiveness of a single six-second daily isometric Yoga and curling excercise training bout (two-thirds maximum holding strength) with that of progressively greater numbers of six-second daily isometric bouts held at eighty per cent of maximum tension. The wrist flexors were selected for this study and all of the Yoga and curling excercise training bouts involved static muscular Circuit trainings. The subjects included thirty post pubescent and twenty-seven pre-pubescent males divided into two experimental groups and one control group at each age level. Subjects in the experimental groups participated in five Yoga and curling excercise
training sessions each week for a period of four weeks. The results of the study indicated that significant gains in strength were achieved by the six-second isometric group at both age levels.

Lawrence and others male subjects ranging from age twenty-four to age forty-one were randomly placed into one of two Yoga and curling exercise training groups to determine if isometric and isotonc Yoga and curling exercise training would facilitate the strength of the quadriceps muscles of both legs. It was found that in both training groups increases in strength of the unCircuit trainingd leg ranged between 65 and 300 per cent to the Circuit trainingd leg.

Hellebrand Waterl was conducted to determine whether Yoga and curling exercise training administered to one muscle group has a measurable impact on the ipsilateral antagonist and the same muscle groups of the opposite side of the body. Thirty-two adult volunteers Circuit trainingd on a wrist ergograph. Duration, frequency, and severity of the Yoga and curling exercise training section varied. It was found that training of the flexors of extensors of the preferred side affects the performance of the agonist and antagonist muscles of both sides.

McCall undertook a study to determine the ipsilateral and contralateral effects of isometric and isotonc ipsilateral training. Forty-five senior high school males were equated into one of three groups. The isometric group trained with the domination arm three times a week for eight weeks. Yoga and curling exercise training consisted of a six-second isometric contraction of the elbow flexor muscles. Findings of the study indicated that isometric training was superior in developing contralateral strength as measured by the cable transmitter.
Walters and others  it was found that either a full of two-thirds maximum Iso metric contraction for forty-live seconds a day for eight consultative days will bring about Components in the strength of the contralateral limb. In this study, contractions were performed with the elbow flexor muscles.

Coleman forty-one male subjects were divided in to two groups and participated in a twelve-week Yoga and curling excercise training program the purpose of the investigation was to “determine the effects of unilateral isometric and isotonic contractions of equal load, duration, and range of motion on the muscular strength of the contralateral limb. (30: 490). It was found by use of the t-test for correlated means that both methods of training brought about significant increases in strength of the non-Circuit trainingd arm. It was also found that no significant difference existed between the two training methods of the two groups.

Henry and smith The dynamometer strength of thirty males, age twenty-one year was measured on each hand in Cross-transfer from the one hand to the opposite hand did not occur. The dominant hand showed 3 per cent loss of strength when there was simultaneous contraction of the contra lateral hand, but there was no influence on the strength of the non-dominant hand.
Williams two matched groups of ten subjects each performed five daily isometric contractions of wrist flexion. One group was measured for five days on the left hand, then five days on the right hand. The other group reversed the sequence. Results after post-testing indicated nonoccurrence of cross-transfer.

Twenty-two high-school student were measured for isotonic wrist flexion strength in a study by Ray one group was measured daily for a week on the right wrist, then similarly on the left wrist measurement of the other group were reversed. Five trials, one minute apart, were recommended at each testing session. No evidence of cross-transfer was found in either group.

Ray’s findings are supported by those of Bowers' subjects were assigned to one of four groups. One of the groups trained the elbow flexor muscles by using five isometric contractions three days a week. For six weeks. No cross-transfer of strength from Circuit training to unCircuit training arm occurred. To provide the background materials for this study review of latest studies related to yoga has been presented in this chapter.

Rakesh, D., Nagarathna, R., & Nagendra, H. R. (1998). This longitudinal prospective randomized control study was aimed to assess flexibility, attention and concentration in students after the intensive practice of Suryanamaskar as compared to physical Circuit training. Normal healthy (n=82) school children (male) 12.16 years (13.21 ± 1.07) from Vivekananda International Public School in Bangalore were randomly assigned into two groups YOGA and Control, after signing
informed consent. The inclusion criteria were age, sex and health. They were taught Suryanamaskar (SN) and Physical Circuit trainings (PE) respectively. Sit and reach (SAR) and goniometry tests for spinal flexibility and six letter cancellation test (SLC) for attention and concentration were administrated to both the groups before and after twenty-eight days. Result showed that data was normally distributed ($p > 0.05$) and baseline was matched ($p > 0.05$) Paired “t” test (two tailed) showed that there was a significant change between pre- and post-values in both the groups (Yoga, $p < 0.001$) and Physical Yoga and curling exercise training ($p < 0.001$) and baseline was matched change between pre and post values in both the groups (Yoga, $p < 0.001$ and Physical Circuit training, $p < 0.01$) on all the Componentss in both the groups. There is a significant change between the groups ($p < 0.001$) in SLCT, SAR and Goniometry (forward & backward). In summary, this study has shown that Surya Namaskar practiced for 30 minutes daily improves spinal flexibility & attention & concentration better than PE in students of 12-16 years of age.

Bhardwaj I. & Singh, S. (1999) In the present research random sampling procedure was followed. A group of 300 deaf and dumb children, age ranged from 14 to 20 years, was selected randomly from the Mata Prakash Kaur Hearing and Speech Handicapped Welfare Center, Kamal and Rotary Club School for Deaf, at Ambala (Haryana). The subjects were equally divided in two groups (e.g. experimental and control), each consisting of 50 students. The students of experimental group went through a training of yoga Circuit trainings (selected asanas and pranayamas) for nine week under strict supervision of the researchers and a specialized deaf and dumb teacher, whereas the students of the
control group did not. Agnihotri’s Self Confidence Inventory (ASCI) designed in Hindi was administrated in assess the level of Self-Confidence. The result of t-test revealed that the experimental group has recorded higher mean value (M=29.90) than post test means scores of control group (M = 27.54), which was statistically significant (t=1.98, p < 0.05). This result clearly shows that post test means scores of experimental group has the higher level of self confidence.

**Jatav, Devendra (1995)** Combination of five elements human body makes a complicated biological structure. Many Bio-chemical changes are seen in these body organs. It is the aim of yoga therapy to improve endocrine gland system and maintaining them in a standard stage by yoga practice. Secretions of hormones by these glands induce biochemical changes in human body. The Bio-chemical system which is induced in the human body generates natural bio-medicinal potentiality. Indian Yogis were acquainted with this natural Bio-medicinal qualities. Yoga methods which is described in Gheranda Samhita, Hathyoga Pradipika and Patanjali Yogasutra, these all are in earlier stage to give total health. Asanas, pranayamas and sudhiknyas are important methods in yoga therapy. Daily practice of yoga is necessary to maintain a psychophysical balance. Health can be defined as the co-operative relation of the various systems in human body. Yoga similarly affects on the human body. Physical, mental and spiritual causes of disease are described in aurveda. The purpose of yoga therapy is maintaining a balance in these three stages. Yoga therapy is an optional therapy which effects without use of external medicine on internal Bio-chemical process and also gives the total medicinal benefits.
Back pain is very common in today's world. Nine out of Ten persons have had at least one episode of Back Pain in their life. Think about it, how many various remedies have you tried when it comes of all the Circuit trainings available, one of the most popular choices of gentle Circuit trainings is yoga. In the beginning, yoga was a Hindu spiritual practice. It is designed as a series of healing Yoga and curling exercise training that work to promote the health of both the mind and the body. Hindus often used a beginner form of yoga known as viniyoga. This form of yoga is extremely easy to learn and is feeling. However, there are some alternatives and this is Circuit training. The combination of breathing and movement techniques make viniyoga the perfect Yoga and curling exercise training for those looking to treat pain within the back and neck. This form of Yoga and curling exercise training also works to improve muscle strength and posture, as well as promoting overall alignment. In asana therapy the body is held firmly and comfortably in the posture and the mind is focused on the posture and the breath. The breath allowed to flow freely or is guided to energies the body and mind. This causes movements and pressures in the chakras system along the spine, assessing the spiritual realm specific to particular asana. Physical psychological and spiritual blockages are cleared. The skeletal and muscular adjustment and alignment that occurs enable the energy to flow throughout the body and all the systems are improve. It is seen that through regular practice of various asana, the back pain can be cured. The asana provides strength to the week muscle, stretches the stiff muscles and provide strength to abdominal muscle which are the main causes of back pain, Asana like Utthita tadasan, Utkatasana helps for alignment to take place in the disk, Sthambhasana helps to strengthen sacroiliac joint, Trikonasana, Bhugangasana, Sarpasana, Naukasana
helps to strengthen back muscle. Dvipada shalbhasana is good asana for those suffering from sciatic nerve pain and also strengthen the lower back. Parvatasana, sputa Janusirsasana, Vaghrasana, Paschimotanasana, Ardha matsyendrasana help in stretching the back muscles. Thus through regular practice of these asana one can prevent back pain.

**Kamalakannan, K. (1998)** A good beginning will have a good end. It is applicable to anything it may be a work of a game. Now a days, sportmen are doing their task well. Though, they have to concentrate in a necessary thing, that is yoga which will help them to develop their ability to get success in all games with a minimum stress and strain. In this paper, the importance and influence of yoga in sports are highlighted. Since Yoga is an extraordinary, exemplary uniquely Indian technique, helping man to develop deep awareness of him of every vibration and pulsation within, at the body, mind and intellect levels, by virtue of which an athlete is well adjusted with the internal and external environments in competition. Yoga plays role during pre-season, competitive season and transitional season stages of athletes. Further, Yoga keep them always in a balance state when they indulge in a game, and it makes his mind fresh and free to reach his goal. This brings success in a competitive game and even in making the players feel free mentally and physically after their hectic task also. In fact, Asanas, Pranayama, Kriyas etc, make sports person physically wealthy and mentally healthy to shoot his aim without obstacles. Thus, in the case of the professional sports person, the right approach is to use yoga.
Souto, Alicia, Mercuri, Nora, Olivera, Ercilia M., & Guidi, Maria L. (1999) The aim of this study was to evaluate the clinical and metabolic changes observed immediately and 3 months after daily yoga practices in a group of people with diabetes (DM). The study included sixteen women (3 with Type 1 DM, 12 with Type 2 DM, and 1 with type 2 DM treated with insulin; mean age 61±11 years, DM history 21±14 years) attending the Physical Activity Program at CENEXA. Group yoga practices consisted in asanas (postures), breathing, relaxation, and meditation techniques performed twice a week (27 sessions in all), complemented by daily individual sessions practiced at home the remaining days of the week. Data recorded at the beginning and at the end of the study included personal information, clinical and metabolic characteristics, type of treatment and control, and complications. Blood pressure (BP), heart rate (HR), and glycemia were also recorded at the beginning and at the end of 13 alternate sessions. Both attendance and compliance of the proposed schedule were high (> 80%), excepting 2 people who deserted, but completed 50% of the study. There were no overall significant differences (beginning vs. end of the study) in BMI, HbA, lipid profile, dietary plan, habitual physical activity practice, BP, and treatment schedule. Conversely, there was significant decrease in HR (8 sessions; p < 0.03) and glycemia (30 sessions; p < 0.03) immediately after the yoga sessions. The positive immediate effect of yoga practices upon glycemia and HR suggests that such practices would be beneficial for the treatment of people with DM.
Kapil, R. C. Vidhale, S. G., & Thakur, (1997) The game of Kabaddi is ancient and essentially of Indian origin. The Pranayama technique of Yoga helps the players to improve their breath holding and canting ability. Hence the general purpose of this study was to find out the effect of selected pranayama on canting ability of the higher secondary school Kabaddi players of Amravati city. A sample of 40 male kabaddi players was selected randomly from 30 higher secondary school of Amravati city. They were divided into two equal groups viz., controlled group-A and experimental group-B. Each group consists of 20 school players. Ujjayi pranayamas and Sitkari Pranayama were given daily 30 minute in the morning except Sundays. The statistical technique i.e. Mean, S.D. ‘t’ va;ie were ised tp analyze the data. Result of this study showed that there is significance difference found between pre and post means of breath holding ability of both the Control and experimental groups. It was, therefore, concluded that the canting ability of Kabaddi players was improved by pranayama.

Deshpande, Prasad P., & Patrikar, V. G. (1998) Yoga is the science of conscious evolution or the science of human possibilities. Humanity is glorified with the unique ornament of buddhi i.e. intelligence. In the course of origination of the universe, mahat is the aftermath of avyakta. However, this mahat is nothing but the intelligence (buddhi). Buddhi promotes the ultimate peace i.e. moksha and destruction of buddhi leads to the deterioration in human values. Thus buddhi is very well co-related to yoga, as the yogic procedure also aim at achieving moksha. The work to be put forth is all about the effect of yogic procedures on intelligence. The work has been demonstrated over healthy individuals in the age group 19-22 years for the period of 30 days.
Dr. Vijay Patrikar, hod, swasthvritta, govt. Ayurvedic College, Nagpur has documented the study in his dissertation. During this experimental study, the subjects were made to perform certain yogic procedures that include yogic breathing, asanas, bandha and pranayama. The intellectual capacity score was worked out on the basis of Raven progressive matrices test. The study validates the claim that the yogic procedures undoubtedly increase the intelligence. Thus the reaffirmation of yoga as an effective tool to excel the buddhi remains as a testimony.

**Vighne, Nitin (1999) “Ashtanga Yoga”** i.e. eight fold of Yoga therapy was employed to fulfil the objectives i.e. to find holistic effect of Yoga-Therapy on students and 45 Double-Triple Murderers. Overall changes in the physical and mental health of prisoners were recorded to ensure prevention of perverted, criminal and antisocial activities and bring about the positive changes. Out of eight parts of Ashtanga Yoga- Yama, Niyama, Asana, Pranayama and Meditation were used. This research was conducted at Nagpur for the period of 5 months and following observations were noted:

1) 90% of the Prisoners from the research group have shown radical changes in following factors viz a) behavioral patterns, b) frequency of irritation, c) incidences impulsive violence, d) food and drinking habits, e) tendency towards addictions, f) reaction time to instigation or positive emotions, g) overall mental and physical health and could enjoy normal health during the period of observation.
2) School students have shown very encouraging results in controlling their temper, and components in memory power concentration power, grasping power, imagination power, obedience, food habits; and as well in reduction of incidences of health complaints, frequency of irritation, irregularity in bowel habits sleep disturbances etc.

**Transformation:** Out of 45 double/triple murderers 33 were transformed into yoga teachers. These transformed yoga teachers were awarded certificates at the hands of State Home Minister on 15th Dec. 1995. The parametric and non-parametric statistical tools were used to arrive at the significance of difference between the control and the experimental group considering the above stated factors. The study has confirmed the significance of Yoga therapy in establishing World Peace, Prevention and Treatment of psychosomatic diseases. At the same time, it speaks volumes for the overall ability of personality of persons who practice yoga regularly. We believe that Yoga is not just a therapy but a way of life and hence can well be accepted as a part of life to ensure prevention and treatment of diseases. It, as well guarantees the overall components of quality of life and promotes mental and physical health on holistic basis.

**Bhavani, Hiteshkumar J. (1998)** The purpose of this study was to find out the effect of certain asanas on cardiovascular efficiency and respiratory ability on twenty students studying in B.Com. first year. First year student of S.V.T.E. Jamnagar were selected randomly as subjects for this study. The asanas training was given for six week continuous to the selected group. Before and after six-week of training, the cardiovascular
efficiency was measured by Cooper 12 min/run and walk test and respiratory ability by Spirometer. The result revealed a statistically significant Components.

Hasrani, S. S (1999) Yoga, viewed at one level as a science of personal growth for spiritual experiences, can also be viewed at therapy level as a science of Health. Yoga helps an individual not only to realize his own self but also understand other issues around him/her. Yogic theory and practices lead to increased self-knowledge. Yogic practices like breathing and posture Circuit trainings help in attaining and maintaining sound health and relaxation of organism. The knowledge gained through Yoga is not simply that of the practical kind relating to techniques, but of a spiritual sort pertaining to grasping something about the nature self and other matters around him/her. One can not be called a knowledgeable person until unless he/she has proper understanding of the processes and happenings going all around. More than that, if one does not know himself/herself, it is very tough to comprehend the surroundings. Knowing the self at rest, at peace, as a being rather than merely as an agent or doer, is a legitimate kind of knowledge but unfortunately that is lost in the mad rush of fulfilling our desires. The value of discovering one’s own self and of enjoying one’s self as it is, rather than what it is going to be, is undeniably worth as well as kind of knowledge.
Traditionally meditations are being always considered having great effect on Stress Management or Anxiety Control. This notation and believe is also increasingly finding acceptance among scientific community, and acceptance is based purely on validation through research findings. Plenty of research work has been conducted worldwide on Transcendental Meditation. The most popular variant of meditation was founded by Maharishi Mahesh Yogi. This study was confined to transcendental mediation in relation to sports anxiety. Forty University level sportsmen who were selected for various university team comprising of Basketball, Judo, Volleyball were acted as subjects for the study. The subjects were equated into two equal group on the basis of pretest record of Sports Competition Anxiety Test of Rainer Marten. One of the groups acting as experimental group while the other was control group. Experimental group was oriented and practiced meditation for 20 minutes daily for 6 weeks. Meditation group was thoroughly trained with basics of Transcendental Meditation and methods to be followed while practicing. The findings of this study indicate that practice of Transcendental Meditation for 6 weeks duration helped to reduce sport competition trait anxiety.

Life in cities like Mumbai is speeding on the fast track with most of the segments of population catching up with the rat race of carer and status. Juxtaposed in this very city are the non-employed housewives living sedentary lifestyles. While most of the working women hit the gymnasium or some related fitness activity making a conscious effort to remain fit, it was observed that the fitness bug still has not smitten these
housewives. Adopting the most eligible excuse of household activities, lured by serials on television, they gradually akin to low-fit and suffer from obesity related health hazards. An experiment therefore was conducted to bring about the awareness of health status and fitness. 60 housewives aged between 30 to 50 years were divided equally into three groups (two experimental & control) on the basis of their age, height and body weight. In pre-test, health related physical fitness Componentss physiological, hematological and bio-chemical Componentss and psychological Componentss were measured using standard tests. After the pre-test, the experimental groups containing 20 subjects each underwent selected Yoga and Aerobic training, daily 1 hour in the evenings except Sundays for a total period of 8 weeks, whereas the control group comprised of 20 subjects did not receive any training program but acted as sedentary control for the same period. After completion o the experiment for 8 weeks post-test was conducted. The result showed a relatively positive change in the fitness level of the subjects that underwent training. Changes were not only evident in the physical but also in the physiological and psychological realms of reflect positive results on the physical, physiological and psychological Componentss of the subjects. The results conclude that regular yoga and aerobics training contributes to improve health related fitness and psycho-physiological status of urban housewifes. Further recommended that, every Urban housewife should enroll in a yoga or aerobics program and practice it daily to improve the fitness status and lead a healthy life.
Bhagirathi, Sameer E. (1998) The purpose of the study was to investigate the effect of kapal bhati on Vital Capacity and Breath Holding Capacity. Forty male subjects were selected randomly from B.P.E.1st year class of Vidya Niketan College of Physical Education, Bhopal. The subjects were categorized into two equal groups by random sampling, using the random numbers. It was also ensured that all of them were medically fit to undergo the training for research project. The age of the subject ranged from 18-21 years. Three respiratory Componentss that are allied to the functioning of respiratory system were chosen for the study (1) Vital Capacity (2) Positive Breath Holding Capacity (3) Negative Breath Holding Capacity. The training of Kapalbhati reveled that there was significant Components in the vital capacity, positive and negative breath holding capacities.

Radhamani, R. (2000) The purpose of the study was to measure the effect of suryanamaskar on flexibility among residential schoolgirls. To achieve this purpose, twenty (20) residential school girls, age of 12 to 14 years, were selected from KCP Siddhartha Aadharsa Resiential school, Vijayawada. Sit and reach test was used to measure the flexibility of the subjects. The subjects were divided into 2 groups i.e. Control Group (30) and Experimental Group (30). Initial test on flexibility was conducted for all the subjects. After 6 weeks training in Suryanamaskar, final test was conducted for all the subjects. The obtained data were statistically analysed by using 't' .ratio. It was found that the practice of Suryanakasmakar has increased the flexibility of residential school girls.
Deo, S.S & Gore, M.M. (2000) Lack of appropriate education in respect of menstruation and its care, inadequate nutrition, absence of Circuit training, social embarrassment and stress have been found to be the causes for the problems of menstruation in adolescent college girls. Yoga is known for establishing a sound health by balancing the psycho-neuro-endocrinal functions. Therefore it was thought to investigate the contribution of yoga practices in solving the menstruation related problems in college girls. Out of 148 girls from IBP Mahila Mahavidyalaya, Aurangabad, having menstrual problems, 60 girls were included in the experimental group and 88 girls formed the control group. Premenstrual symptoms were backache, body ache, pain in breast and abdomen, irritability, leucorrhoea and acne. The menstrual problems included dysmenorrhea, excessive bleedings, scanty flow, depression, backache, body ache, lethargy, weakness, abdominal pain and irregularity in cycles. Only the experimental group was given yoga training and was advised to follow it for 6 months. The premenstrual and menstrual problems were noted from the questionnaire along with other relevant information. The severity and frequency of these problems was reduced in 60% girls who suffered from premenstrual and menstrual problems. Although the benefit was not uniform for all problems in all girls, yoga seems to be non-invasive, economical and yet constructive means in managing these problems.

Dhondge, Vinay Dattatrya (1999). There are many reasons due to which students put them in mental imbalance. The reasons like economical conditions of the family, interrelationships in the family, disputes of parents, failure in studies, unemployment, inadequately uncomfortable place to live, injustice seen in the society etc. and all these
adversely affect the students behaviour totally (both inwardly and outwardly). Students are under tremendous tension when they reach the stage of awareness of the environment and universe around them. Student teachers get under tension many a time during training programme. Pressure is observed in doing different types of work. As far as students are concerned, they feel tensed in each learning activity such as to be present on time, giving practice lessons, following college discipline, appearing for the tutorial, preparing reports, submitting reports before time etc. Based on these and considering some attributes of yoga, a model has been formulated to enhance the competencies of student teachers.

**Pise V.N., Waghchoure M.T. (2000)** This study was conducted with a view to see the effect of selected yogic practices on health related physical fitness components of mentally retarded children. It has been intently seen that children with the low levels of IQ or mental retardation shows low levels of health related physical fitness measures, which can be explained by an inactive lifestyle, a result of lack of awareness of the positive physical effect of yoga or lack of motivation for any motor activity. In this study health related physical fitness of 20 subjects, aged 8 to 12 years were assessed and divided into two equal groups viz., experimental and control. The experimental subjects underwent a Yoga practices comprising of various Asanas, whereas the control group was engaged in their regular activities. The results of 2 x 2 x 5 Factorial ANOVA and Scheffe's post hoc test revealed that Yogic practices enhanced the health related physical fitness components viz., flexibility, cardiovascular efficiency, strength etc. The research was performed under real-life conditions, enabling relatively easy implementation in the
existing conditions of special education center for mentally retarded children. Yoga practices are easy to operate without entailing long-term budgetary expenses and might have improved the health status of children with mental retardation. From the results it can be concluded that there is significant positive impact of yogic practices on health related physical fitness components in mentally retarded children.

Dr. C. Ashok (1999). Asanas, the bodily postures, help to strengthen the body and stabilize the mind. That posture, in which a man can remain longest without effort, is for him the best. The very word 'asana' means 'easy, comfortable' and so the postures should be to have their full effect. The body are eliminated and the mind dissolves into the Infinite. Asanas have been evolved over the centuries so as to Yoga and curling exercise training every muscle, nerve and gland in the body. They secure a fine physique, which is strong and elastic without being muscle-bound and they keep the body free from disease. Hence the investigator tried to find out the influence of active stretching Circuit trainings that are very similar to asanas. To achieve the purpose, Twenty-four trained intercollegiate basketball players were selected at random from the colleges affiliated to Madurai Kamaraj University, Madurai. From the selected twenty-four players, twelve players were randomly assigned as subjects for control group and the other twelve players for experimental group. All the subjects were initially tested at different conditions such as during rest, just five minutes prior to competition and immediately after competition, before and after the experimentation. The Componentss plasma cortisol was tested. The experimental group underwent twelve weeks practice of active stretching Yoga and curling exercise training where as the control group did not undergo any type of
training. This study comes under 2 (groups) x 2 (treatment) x 3 (competition) factorial design. The data pertaining to the Components in the study was examined by Factorial Analysis of Variance with repeated measures on the last two factors (ANOVA). This study indicates that there was significant mean difference between cortisol level during rest (morning) and cortisol level immediately after the competition irrespective of groups and treatment (active stretching Circuit trainings).

Niphadkar, Pramod Mukund. (2001) More than 3000 case studies guided the researcher to undertake this experimental study that aims at evaluating the effect of a special yogic programme on the school students as far as their eye problems specially the minus numbers are concerned. Total 50 school students are considered in this project. Out of those, 25 students were given special yogic prakriya of eyes. This special yogic programme includes Surya Tratak, Jyoti Tratak, Bindu Tratak and Various movements of eyes. The defects of eyes were measured in the beginning of the course and at the end of the course of 15 days. The result indicates that the 30 experimental group could reduce the minus number of eyes from – 2.5 to – 1.0 (however, 2 students did not change), where as there is no change found in the other 25 students who were not practicing the special programme. This study recommends that the practice this special yogic programme properly and regularly is effective to reduce the minus number of eyes and also to keep the health of eyes.
Bhowmik, Sanjib Kumar & Ghai, G.D. (2002) Yogic practices are getting much more popularity to look after children's health and fitness. A few studies proved that the positive changes in various areas of health related fitness on school going children. No report so far available on the psychomotor fitness of physically handicapped school children in relation to Yoga. Forty subjects between the age of 8-15 years was, therefore, selected from Amar Jyoti School & Rehabilitation Centre, Gwalior (M.P.). The components measured were speed of movements, hand steadiness and eye-hand coordination. The training programme was scheduled for five days a week 45 minute each per week for 6 weeks duration, and was increased to 60 minutes on weekly basis in a progressive way. Further, the group was divided through the help of randomly design into control & experimental group. Each group had equal sample size of 20 each. The selected psychomotor components were recorded on pre & post completion of six weeks yogic Circuit trainings. The data on Psychomotor components were recorded with the help of standard procedure such as: Speed of movement test by Nelson & Johnson's, Hand steadiness by hand steadiness tester & Eye hand Coordination by mirror tracking test. In order to study the effects of yogic exercise training on selected psychomotor components statistically, the analysis of covariance technique was employed to analyze the raw data at .05 level of significance from the finding. It was observed that F – ratio was found to be significant at 0.05 level for all the selected psychomotor for characteristics i.e. Speed of movement, Hand steadiness & Eye Hand Coordination in comparison to control group. This study, therefore, suggests the utility of selected yoga practices for the above physically challenged students.
Saroja, M. (2002) Yoga technique is ideally suited to prevent physical and mental illness and protect the body-known to all. In fact it has become our a way of life, which can be practiced regardless of age, conditions of health, religion or nationality. The study was designed to evaluate the effect of Yoga and curling excercise training on physical fitness of school boys, aged 12 to 16 years, from the school in pudukkottal district. To find out the physical fitness, the Europe physical fitness test was conducted. Initial reading was taken before administering the yogic practices. Yoga training was then given to experimental group for fives days in a week with total period of ten weeks, however the other group worked as control. Final data was then collected. T-ratio was used to find out the significant difference between the groups. The findings of the experiment showed that the selected yogic Circuit trainings improved the performance of standing broad jump, sit and reach 20mts shuttle run, vertical jump and sit-ups.

Lolage, R. S. & Bera, T.K. (2001) Research Literature in sports and allied sciences revealed no information about the influence of pranayama on cardiovascular efficiency of Kho kho players. This experiment, therefore included forty (N=40) male college level kho kho players age ranged from 20-30 years, from Pravara College of Physical Education (Maharashtra, and Control) and their cardiovascular efficiency was assessed by administering three tests viz. harverd step Test (r=0.63, p < 0.01), 8 minute Run Test (t = 0.73, P < 0.01) and 1600 M Run Test (r = 0.60, p < 0.01), 8 minute Run Test (r = 0.73, P < 0.01) of pranayam (viz., anuloma-viloma, Ujjayi, Suryavedana and bhastrika) in two sessions of 45 minute for each session day-1 (Morning and evening) and 6 days week1 for a total period of 3 months. The subjects of control group did
not participate in the above programme, however they were kept busy with interesting activities separately during the experimental period. As pre-post test data showed a larger variability, the result of ANCOVA revealed 1) efficiency were not same, 2) Harvard Step Test could measure CV efficiency with insufficient reliability ($r=0.30$, $p > 0.05$) whereas other two tests i.e., 8 – Minute Run ZTest and 1600 M Run test could measure this Components with acceptable reliability ($r=0.82$, $p < 0.01$, $r = 0.80$, $p < 0.01$, 3) selected pranayamas were found useful in providing CV endurance of High school sprinters.

Kannan, S. (2001) Yoga originated in ancient India and in one of the longest surviving philosophical systems in the world. Yoga is precise, practical, provable science. The teachings of yoga are expressed differentially in different traditions. The various physical and mental disciplines of yoga were seen as method for individuals to attain union with divine. There are a number of different schools of yoga, even within a particular school or tradition, the asanas and breathing Yoga and curling exercise training can be tailored to be the person’s needs. Thus yoga is a stilling of mind. Yoga is the ladder to spiritual liberation, a practical method of union with God. In ancient days rishi and seers taught yoga to disciples in a gurukula method where there was one to one. Yoga can help transform every part of a human being’s life, and if enough people do it, it can transform the globe. A well trained knowledge of teacher in Anatomy and Physiology is recommended for teaching yogic Circuit trainings. The presentation of the teacher should have excellent communication skill to reach the students. Yoga stretches are used by physical therapists and professional sports teams. Many prestigious
schools of medicine have studied and introduced yoga techniques as proven therapies for illness and stress.

**Khan, Chand., Lekawale, V. L., & Bera T.K. (2002).** This study was conducted with a view to see the effect of yoga on Components of skills of elite hockey players. Forty (n=40) male Hockey players studying in senior college, available in the IQRA’S H. J. Thin College of Arts and Science, Meherun, Jalgaon (Affiliated to N. M. University, Jalgaon), with age group 18 to 25, were participated in the study. These subjects were divided into two equal groups viz., Group A (n1=20) experimental group and Group B (n2=20) control group. Group A i.e. experimental group participated in the regular activity as per the college schedule and also under went special training programme of yoga practice and Hockey skills practices like ball control test and goal shooting test, while the Group B i.e. control group participated in their regular activities as per college schedule and not allowed to participate in any special training programme. The results of this study reveals that yoga training programme has significant effect on Components of skills in elite hockey players. From the results it is concluded that yoga training specially designed for hockey players might have improved the skills like ball control and goal shooting.

**Limbkar, Jitendra, & Bera T.K. (2000)** Shooting is a skill, which is, in fact, a deciding factor to win most of the game and sports. The time which has become past, whether recorded in history or not, has left foot prints as an evidence that shooting, is one form or other, had been associated and grew with the evolution of human being. Hence the present study was undertaken with a view to evaluate the effect of yoga
stretching and Relaxation on accuracy in Rifle shooting among school student. Eighty students (n=80) of Chembur Naka Municipal School Chembur, Mumbai with age ranging from 12-17 years, were selected randomly for the experiment. All the subjects were divided into four equal groups viz., Group A (n1=20; rifle shooting), Group B (n2=20; Yoga & rifle shooting), Group C (n3=20; Yoga and visual observation of rifle shooting) & Group D (n=20; Control). All the subject of different experimental and control groups were exposed to the tests involving shooting ability, speed and accuracy and fluctuation of attention to record the pre-post test data. The various training interventions for different groups were imparted for a total period of six weeks. Result of ANCONA followed by Scheffe’s post hoc test indicates that yoga training was more effective for improving accuracy in rifle shooting. The results also helped to conclude that yoga stretching and relaxation techniques would be more advantageous to achieve accuracy in rifle shooting.

Benson, Mary & Bera, T. K. (2003). Ability of norms was the prime objective of the present study. The researcher used the components mentioned by AAHPERD for measuring Health Related Physical Fitness in the visually impaired. In this project, a Health Related Physical Fitness Test battery was formulated especially for the visually impaired. The same was developed and standardized and established the norms successfully. The subjects were all male visually impaired students studying in the blind schools of Mumbai and Pune. The age group ranged from 12 to 14 years. The data was collected on one thousand (n=3000) blind students by administering the Health Related Fitness test. To assess the health related physical fitness, the specified tests used were: Harvard
The origin of yoga goes so far back into antiquity that they have been lost in passing centuries. Certain sages of India, developing their lives to study man’s nature and problems, gradually evolved organized system of control by means and methods of which he could raise his capacities in all direction i.e. physically, mentally, socially and spiritually to their highest level. Coaches, physical education teacher and sports scientist strive to optimize sportsman’s performance. To achieve this goal they must consider to yogic practice for ability of accuracy in game and sports. As we know that the prior to a short being taken there is an extreme depth of concentration by the shooter is required. For this study Fifteen (n = 15) Basketball players in the age group of 18 to 21 years of boys act as a subject. The experiments were administered in District Stadium, Aligarh. Selected yogic practices were imparted to experimental group for a period of eight weeks. The yoga training was given daily in the evening session for duration of one hour. The subjects availability for yogic training was evening therefore the training session of yogic practice was evening only i.e. 6:30 p.m. to 7.30 p.m. The data collected from the subjects were statistically analysed by using ‘t’ test. It was observed from the data that mean index score has increased by +7 after the treatment. Since calculated ‘t’ > Tabulated ‘t’ (7.97 > 1.83). Thus, it may be concluded that yoga practice have positive effect on ability of accuracy in Basketball.
Chaya, Nagendra & Khanna (1999) concluded that vital role played by yoga. Physical fitness, fitness related to health, skill and performance has assumed tremendous importance in recent times.


Results: Data indicated a significant rate of Components in yoga subjects who completed the prescribed length (5 days/wk for 3 months) of yoga practices as compared with drug therapy. At least 7% of yoga subjects were reported to be completely asymptomatic as compared with none of the drug therapy.

Bowman, A. J., Clayton, R. H., Murray, A., Reed, J. W., Subhan, M. M., and Ford, G. A. (1997). The effects of aerobic Yoga a non-aerobic control intervention, on the baroreflex of elderly persons were determined. Baroreflex sensitivity was quantified by the alpha-index, at high frequency (reflecting parasympathetic activity) and mid-frequency (reflecting sympathetic activity as well), derived from spectral and cross-spectral analysis of spontaneous fluctuations in heart rate and blood pressure. Twenty-six sedentary, healthy, normotensive elderly subjects were studied. Fourteen of the sedentary elderly subjects completed 6 weeks of aerobic training, while the other 12 subjects completed 6 weeks of yoga.
Results: Heart rate decreased following yoga but not aerobic training. VO2 max increased by 11% following yoga and by 24% following aerobic training. No significant change in alpha MF or alpha HF occurred after aerobic training. Following yoga, alpha HF but not alpha MF increased.

**Madanmohan, Udupa, K., Bhavanani, A.B., Shatapathy, C.C. & Sahai, A. (2004).** This study reports the effects of yoga training on cardiovascular response to Yoga and curling excercise training and the time course of recovery after the Circuit training. Cardiovascular response to Yoga and curling excercise training was determined by the Harvard step test using a platform of 45 cm height. The subjects were asked to step up and down the platform at a rate of 30/min for a total duration of 5 min or until fatigue, whichever was earlier. Heart rate (HR) and blood pressure response to Yoga and curling excercise training were measured in the supine position before Yoga and curling excercise training and at 1, 2, 3, 4, 5, 7 and 30 minutes after the Circuit training.

Results: Yoga and curling excercise training produced a significant increase in HR, systolic pressure and a significant decrease in diastolic pressure. After two months of yoga training, Circuit training-induced changes in these parameters were significantly reduced.

The purpose of this study was to determine the effects of yoga training on the intensity of delayed onset muscle soreness. 24 yoga-trained and non-yoga-trained women were administered a bench-stepping Circuit training. Muscle soreness was assessed using a Visual Analog Scale. Groups were also compared on body awareness, flexibility using the sit-and-reach test, and perceived exertion.

Results: Muscle soreness decreased and flexibility increased using the sit-and-reach-test after yoga.

Bera, T. K. & Rajapurkar, M. V. (1993). Forty male high school students, age 12-15 yrs, participated in a study on yoga in relation to body composition, cardiovascular endurance and anaerobic power. The Ss were assigned to a yoga group and control group. Body composition, cardiovascular endurance and anaerobic power were measured.

Results: The results revealed a significant Components in ideal body weight, body density, cardiovascular endurance and anaerobic power following yoga.

Raju, P. S., Madhavi, S., Prasad, K. V., Reddy, M. V., Reddy, M. E., Sahay, B. K., & Murthy, K. J. (1994). The effect of yoga breathing practice on Yoga and curling excercise training tests was studied in athletes in two phases; sub-maximal and maximal Yoga and curling excercise training tests.
Results: At the end of phase I (one year) both groups (control and experimental) achieved significantly higher work rate and reduction in oxygen consumption per unit work. There was a significant reduction in blood lactate in the experimental group, at rest. At the end of phase II (two years), the oxygen consumption per unit work was found to be significantly reduced and the work rate significantly increased in the experimental group. Blood lactate decreased significantly at rest in the experimental group only.


Results: Back-related function in the yoga group was superior to the book and Yoga and curling excercise training groups at 12 weeks and at 26 weeks.

Wood, C. (1993). Effects of relaxation, visualization and yogic breathing and stretch were assessed on perceptions of physical and mental energy and on positive and negative mood states in a group of 71 normal volunteers.

Results: Stretching produced a significantly greater increase in perceptions of mental and physical energy and feelings of alertness and enthusiasm than the other two procedures. Relaxation made subjects significantly more sleepy and sluggish immediately after the session than
stretching. Visualization made them more sluggish but less content than stretching and more upset than relaxation after the second session.

**Baldwin, M. C (1999).** The purpose of this study was to explore the psychological and physiological differences between adult Circuit trainingrs who added a weekly yoga class to their regular Yoga and curling excercise training program and those who did not. Subjects were pre tested and post tested for mood state, stress response, recovery heart rate, and spinal/hamstring flexibility. Over a period of eight weeks, subjects in both groups continued their normal Yoga and curling excercise training habits and maintained Yoga and curling excercise training logs. Subjects in the Yoga Group added a weekly yoga class. Subjects in the Control Group received a yoga class at a later time. At the end of eight weeks, Yoga and curling excercise training logs were collected and post tests were conducted.

**Results:** The results suggested: (1) more positive mood change in the Yoga Group over eight weeks, (2) more immediate positive affect from yoga than from cardiovascular or resistance training activities, (3) more compliance with yoga than with cardiovascular or resistance training activities, (4) comparable perceived exertion ratings for 'moderate' Hatha Yoga and routine aerobic Circuit training, (5) an 8% gain in spinal and hamstring flexibility in the Yoga Group over eight weeks, and (6) decreased vulnerability to stress in the Yoga Group, at the same time that sources of stress for that group increased.