

CHAPTER - II

REVIEW OF RELATED LITERATURES

The phrase “Review of Literatures” consist of two words “review” and “Literature” in research mythology the term Literature refers to knowledge of a particular area of any discipline, which includes theoretical practical and it is research studies.

The literature in any field of forms the foundation upon which all further work knowledge provided by the review of literature one work will be build. If we fail to build foundation of knowledge provided by the review of literature one work to be shadow and that has already done better by someone else. The following literature is collected through book, magazines, and research quarterlies available in the library of Tamil Nadu Physical Education Sports University, Chennai and through internet of the related work would hold in finds the direction of study.

2.1 STUDIES ON PUBERTAL DEVELOPMENT

Kathleen Doheny (2010) conducted a study on the age of puberty is declining for girls, with more girls developing breasts by age 7 than in years past, according to a new study. In his purpose of the study was 1,239 girls, randomly selected 10% of whites, 23% of African-Americans, and 15% of Hispanic girls had breast development indicating onset of puberty by age 7, Biro found. Breast Development More Common than Reported was measured, Pretest was conducted before the experimental training and post test was conducted immediately after the experimental training. The experimental training of yogic practices was given for a period of 12 weeks. The experimental training consists of the researchers assessed the onset of puberty by a standard measurement of breast development. They found that 10.4% of white girls in the current study had breast development, compared to 5% in the 1997 study. 23.4% of African-American girls had beat development, compared to 15.4% in the 1997 study. The collected data were analyzed using independent t test. The result of the study show that there was a significant improvement on Besides ethnicity, body mass index or BMI was found to play a role in onset of puberty, Biro's team found. Girls who had breast development at age 7 were more likely to have a higher BMI.

Saraswati Hunshal (2010) conducted a study on effect of pubertal development among school girls. To achieve the purpose of the study 384 school girls were selected from two urban and two rural schools from Dharwad and Khurda Districts of Karnataka and Orissa. Their age ranges between 9 and 15 years. The variables are Self-structured questionnaire was used for eliciting required information about physical growth, secondary sex characteristics and about menstruation. Pretest was conducted before the experimental training and post test was conducted immediately after the experimental training. The collected data were analyzed using independent t test. The information was collected by in depth personal interview and by referring to school records. Information about puberty milestone or secondary sexual characteristics was collected by using Tanner scale. The result of the study show that there was a significant results revealed that the development of all puberty milestones such as breast (B2), pubic hair (PH2), auxiliary hair development and menarche were found at earlier age among girls of both regions compared to Tanner's stages of pubertal development.

Boot AM, de Ridder MA (1997) Bone mineral density in children and adolescents: relation to puberty, calcium intake, and physical activity. The association of height, weight, pubertal stage, calcium intake, and physical activity with bone mineral density (BMD) was evaluated in 500 children and adolescents (205 boys and 295 girls), aged 4-20 yr. The BMD (grams per cm²) of lumbar spine and total body was measured with dual energy x-ray absorptiometry. Lumbar spine volumetric BMD was calculated to correct for bone size. BMD and volumetric BMD increased with age. During puberty, the age-dependent increment was higher. After adjustment for age, the Tanner stage was significantly associated with all three BMD variables in girls and with spinal BMD in boys. In boys, positive correlations were found between BMD and both calcium intake and physical activity after adjustment for age. Stepwise regression analysis with weight, height, Tanner stage, calcium intake, and physical activity as determinants with adjustment for age resulted in a model with Tanner stage in girls and weight in boys for all three BMD variables. The major independent determinant of BMD was the Tanner stage in girls and weight in boys.

Kerstin Albertson (1996) conducted a study on effect of Circadian Cortisol Rhythms in Healthy among Boys and Girls. The purposes of the study Group of 235 Healthy Children (162 Boys and 73 Girls) were selected from Sweden. The age range

was between 2.2–18.5 yr. The variables are Age, Growth, Body Composition, and Pubertal Development. Pretest was conducted before the experimental training and post test was conducted immediately after the experimental training. The experimental training consists of Serum cortisol was analyzed from venous blood samples taken at 1400, 1800, 2200, 0200, 0400, 0600, and 1000 h. Regardless of high or low mean diurnal cortisol levels, repeated measurements within and between pubertal stages indicated that an individual remains in his or her cortisol range throughout pubertal development. No evidence was found for differences in temporal placement or level of the circadian cortisol rhythm in relation to age, growth, or body composition. Despite This Variability between Individuals, There Is No Correlation between Cortisol Levels and Either Body Composition or Growth Rate.

Rankinen T (1995) Dietary intake and nutritional status of athletic and nonathletic children in early puberty. Dietary intakes, trace element status, and anthropometric measures were studied in 12- to 13-year-old boys ($n = 49$) playing ice hockey (AB) and in 11- to 12-year-old girls who were gymnasts, figure skaters, and runners (AG; $n = 43$). Thirty-five boys (CB) and 53 girls (CG) not involved in supervised sports were controls. After adjustment for sexual maturation, ABs had larger upper arm muscle circumference than CBs. The sum of four skinfolds was smaller in AGs than in CGs. The intake of energy and all micronutrients examined was higher in ABs than in CBs. Micronutrient intakes were not different between AGs and CGs. Compared to CBs, serum ferritin and copper concentrations were lower, but serum zinc concentration was higher in ABs. No differences in trace element status were found between AGs and CGs. Blood investigations did not indicate inadequate trace element status in any of the groups studied.

Marin G et.al., (1994) The effects of estrogen priming and puberty on the growth hormone response to standardized treadmill exercise and arginine-insulin in normal girls and boys. To determine the effects of puberty and estrogen priming on the GH response to standardized treadmill exercise and arginine-insulin in normal boys and girls, we performed tests in 84 normal children (41 girls and 43 boys) representing all stages of puberty. A subset of the pre pubertal children received the tests twice, with or without the administration of ethinyl estradiol (40 micrograms/m² daily) for 2 days before the tests. The peak GH response to the three tests increased significantly with pubertal stage ($r = 0.57$; $P < 0.0001$), but did not differ between boys and girls at the

same stage. With advancing puberty, the percentage of normal children who failed to attain a GH level greater than 7 micrograms/L during any of the three tests declined from 61% at pubertal stage 1 to 44% at stage 2, 11% at stage 3, and 0% at stages 4 and 5. Administration of estrogen to the pre pubertal subjects raised the normal range for the peak GH response to the three tests from 1.9-20.3 to 7.2-40.5 micrograms/L. We conclude that both puberty and estrogen administrations significantly increase the peak GH response to exercise, arginine, or insulin in normal subjects. Moreover, the conventional criterion that the peak GH response to three stimulation tests should exceed 7 micrograms/L was applicable in our study only to subjects who had attained pubertal stage 4 or 5 or who had received estrogen administration.

Greene SA, Torresani T, Prader A (1987) Growth hormone response to a standardized exercise test in relation to puberty and stature. Growth hormone (GH) was measured before and 10 minutes after a standardized bicycle exercise test (duration 15 minutes) in 37 short children (group 1: mean (SD) age 12.8 (3.5) years; mean (SD) bone age 10.4 (3.6) years; mean (SD) height standard deviation score (SDS) -2.8 (0.7)], 16 tall children (group 2: mean age 12.9 (2.8) years; mean bone age 13.9 (1.4) years; mean height SDS 3.0 (0.8)], and 30 normal children (group 3: mean age 13.3 (3.2) years; mean bone age 12.8 (3.4) years; mean height SDS -0.4 (0.8)]. Results of GH are expressed as mean (SEM). The pre-exercise GH was similar in the three groups (group 1, 8.0 (2.3) m U/l, group 2, 8.5 (2.5) m U/l, and group 3, 8.3 (2.3) mU/l). There was a significant rise in GH after exercise in all three groups. GH after exercise was higher in group 2 (35.1 (2.5) mU/l) compared with groups 1 and 3 (17.8 (3.0) and (20.8 (3.2) mU/l). Post-exercise GH was less than 10 m U/l in 29 children (34% total; 49% group 1, 6% group 2, and 34% group 3). There was a positive relation between post-exercise GH and both bone age and pubic hair stage. Multiple regression analysis revealed that relevant predictors of a rise in GH with exercise were different for the sexes in these children with varying stature: for boys, bone age and pubic hair stage; for girls, height and height SDS. All the tall girls were in puberty. No statistical relation was observed between post-exercise GH and cardiovascular response to exercise, time of day of exercise, time of eating before exercise, and plasma insulin or insulin to glucose ratio at time of exercise. We conclude that the GH response to the physiological stimulus of exercise is higher in puberty compared with childhood. Therefore, although children may be suspected of having GH deficiency after a failure of GH to increase after

exercise, a non-response may be a normal finding in pre pubertal children, independent of stature.

Hopwood NJ (1985) conducted study on Pathogenesis and management of abnormal puberty In the prepubertal child, the hypothalamic-pituitary-gonadal (H-P-G) axis is functional and extremely sensitive to negative feedback inhibition by low circulating levels of sex steroids. This feedback system may be under the control of unknown CNS inhibitory mechanisms. Clinical signs of puberty are preceded by increased pulsatile secretion of hypothalamic gonadotropin-releasing hormone(GnRH) followed by increased pituitary responsiveness to GnRH. Gonadotropin secretion, particularly LH, increases in both sexes, especially during sleep ,resulting in gonadal stimulation, secretion of sex steroids, and progressive physical maturation. When any phase of the H-P-G axis malfunctions, abnormal puberty can result. Abnormal puberty may be precocious or delayed. When puberty is precocious it may be isosexual or heterosexual, complete or partial, intermittent (unsustained), or progressive. True (central) precocious puberty is usually progressive, and hormonally reflective of normal puberty, although occurring at an earlier age, whereas intermittent or un-sustained precocious puberty usually is associated with immature patterns of gonadotropin secretion, or with complete gonadotropin suppression as in precocious pseudopuberty (ovarian or adrenal tumors). Cranial axial tomography, gonadotropin response to GnRH, and pelvic ultrasound in girls are useful tools to aid in the differential diagnosis of these conditions. Intermittent, or unsustained, puberty in girls is usually self-limited, requiring no medical or surgical intervention. True progressive central precocity may now be managed with GnRH analogues, which effectively arrest pubertal changes as well as slow rapid linear growth and skeletal maturation. Although a maturation lag usually explains most patterns of delayed puberty, it is often challenging to exclude other conditions that may contribute to slow pubertal progression, such as chronic illness, excessive exercise, emotional stress, anorexia, or drug use. Elevated serum gonadotropin levels direct further evaluation toward etiologies of gonadal failure, including gonadal dysgenesis, Klinefelter syndrome, and chemotherapy/irradiation damage. Both low gonadotropins and absence of or immature gonadotropin response to GnRH administration after a bone age of 11 years in girls and 13 years in boys point toward hypopituitarism or isolated hypogonadotropic hypogonadism. Management withadministration of gradually incremented amounts of sex steroids at an appropriate

psychologic age usually leads to enhanced linear growth, physical maturation, and improved self-esteem.

Baker ER (1985) Body weight and the initiation of puberty the onset and progression through the various stages of puberty are influenced by a number of factors (Fig. 2). In both animals and humans, the age of puberty appears to be related more to body weight than to chronologic age. Under nutrition and low body fat, or an altered ratio of lean mass to body fat, seem to delay the adolescent spurt and to retard the onset of menarche. According to Frisch, a minimum level of fatness (17% of body weight) is associated with menarche; however, a heavier minimum weight for height, representing an increased amount of body fat (22%), appears necessary for the onset and maintenance of regular menstrual cycles in girls over 16 years of age. This critical amount of body fat implies that a particular body composition, in addition to other environmental and psychosocial factors, is important in triggering and maintaining the pubertal process. Pubic hair growth and breast development begins in most American females between the ages of 8-13. Menarche follows 4.2 years later for 50% of the females, but of others, the time period ranges from 18 months to 6 months or years. Both males and females experience hormonal changes before the 1st physical signs of puberty are manifested. As sex hormones increase, changes in the body's proportion of lean, fat, and skeletal mass occur. For females an increase in body fat begins at 7 years and continues through ages 16-18 years. Studies indicate that the body's fat content must account for 17% of the body's weight before menarche can occur and that, at age 18 years, the fat content must be at least 22% for the maintenance of regular menstrual cycles. In contrast overweight females often experience menarche earlier than the average weight female. Athletic females and ballet dancers frequently experience late menarche, and these delays may be due to the disruption in fat accumulation which results from excessive exercise.

2.2 STUDIES ON PUBERTAL DEVELOPMENT AMONG PRETEEN GIRLS

Balaram Pradhan and J Yoga (2009) Effect of yoga relaxation techniques on performance of digit–letter substitution task by teenagers the Subjects consisted of 253 school students, 156 boys, 97 girls, in the age range 13–16 years, who were attending a 10-day yoga training course during summer vacation. The selected subjects had English as their medium of instruction in school and they acted as their own controls. They

were allocated to two groups, and tested on the DLST, immediately before and after 22.5 minutes practice of CM on one day, and immediately before and after an equal period of SR on the other day. The first group performed CM on day 9 and SR on day 10. For the second group, the order was reversed. Within each group pre-posttest differences were significant for both the relaxation techniques. The magnitude of net score improvement was greater after SR (7.85%) compared to CM (3.95%). Significance levels were $P < 0.4 \times 10^{-9}$ for SR and $P < 0.1 \times 10^{-3}$ for CM. The number of wrong attempts also increased significantly on both interventions, even after removing two outlier data points on day 1 in the SR group. Both CM and SR lead to improvement in performance on the DLST. However, these relaxation techniques lead to more wrong cancellation errors. Mean values and standard deviation for digit–letter substitution task total score, net score, and wrong substitution score

Bin Huang (2006) study on conduct Since pubertal maturation is an important covariate in studies that evaluate physical and social changes that occur during the teen years, we examined pubertal parameters in a group of US girls. The study included 615 (77.2% prepubertal) white and 541 (49.4% prepubertal) black participants. Mean onset of puberty was 10.2 and 9.6 years in white and black girls, respectively, menarche was 12.6 and 12.0, achievement of Tanner growth stage 5 was 14.3 and 13.6, and achievement of adult height was 17.1 and 16.5 years. The Pearson's correlation coefficient between menarche and onset of puberty was .37. Pre test was conducted before the experimental training and post test was conducted immediately after the experimental training. Menarche is often used as a marker for onset of puberty and for timing of puberty. Data gathered over the past 20 years suggest only moderate correlation between menarche and onset of puberty (.37-.38), which has decreased significantly during the last 50 years. This suggests the existence of both similar and unique factors that impact the age at onset of puberty and age at menarche.

2.3 STUDIES ON DYNAMIC HATHA YOGA SADHANA

Harinath et al. (2004) conducted a study on effects of hatha yoga and omkar meditation on cardio respiratory performance, psychological profile, and melatonin secretion. Thirty healthy men were randomly divided into two groups. Controls performed body flexibility exercises for 40 minutes and slow running for 20 minutes during morning hours and played games for 60minutes during evening hours daily for 3

months. Group 2 subjects practiced selected yogic postures for 45 minutes. Yogic practices for 3 months resulted in improved cardio respiratory performance and psychological profiles. Plasma melatonin also increased after three months of yogic practices.

Boyle et al. (2004) conducted a study on the effects of yoga training and a single bout of yoga on delayed onset muscle soreness in the lower extremity. 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 exercise. 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. Muscle soreness decreased and flexibility increased using the sit-and-reach-test after yoga.

Madanmohan et al. (2004) conducted a study on modulation of cardiovascular response to exercise by yoga training. This study reports the effects of yoga training on cardiovascular response to exercise and the time course of recovery after the exercise. Cardiovascular response to exercise was determined by the Harvard step test using a platform of 45 cm height. The subjects were asked to step up and down the platform at a rate of 30/min for a total duration of 5 min or until fatigue, whichever was earlier. Heart rate (HR) and blood pressure response to exercise were measured in the supine position before exercise and at 1, 2, 3, 4, 5, 7 and 10 minutes after the exercise. Exercise produced a significant increase in HR, systolic pressure and a significant decrease in diastolic pressure. After two months of yoga training, exercise-induced changes in these parameters were significantly reduced. Conducted a study on modulation of cardiovascular response to exercise by yoga training. This study reports the effects of yoga training on cardiovascular response to exercise and the time course of recovery after the exercise. Cardiovascular response to exercise was determined by the Harvard step test using a platform of 45 cm height. The subjects were asked to step up and down the platform at a rate of 30/min for a total duration of 5 min or until fatigue, whichever was earlier. Heart rate (HR) and blood pressure response to exercise were measured in the supine position before exercise and at 1, 2, 3, 4, 5, 7 and 10 minutes after the exercise. Exercise produced a significant increase in HR, systolic pressure and a significant decrease in diastolic pressure. After two months of yoga training, exercise-induced changes in these parameters were significantly reduced.

Tran et al. (2001) showed that ten healthy, untrained volunteers (nine females and one male), ranging in age from 18–27 years, were studied to determine the effects of dynamic hatha yoga practice on the health-related aspects of physical fitness, including muscular strength and endurance, flexibility, cardio respiratory fitness, body composition, and pulmonary function. Subjects were required to attend a minimum of two yoga classes per week for a total of 8 weeks. Each yoga session consisted of 10 minutes of pranayamas (breath-control exercises), 15 minutes of dynamic warm-up exercises, 50 minutes of asanas (yoga postures), and 10 minutes of supine relaxation in savasana (corpse pose). The subjects were evaluated before and after the 8-week training program. Isokinetic muscular strength for elbow extension, elbow flexion, and knee extension increased by 31%, 19%, and 28% ($p < 0.05$), respectively, whereas isometric muscular endurance for knee flexion increased 57% ($p < 0.01$). Ankle flexibility, shoulder elevation, trunk extension, and trunk flexion increased by 13% ($p < 0.01$), Review of Related Literature 44155% ($p < 0.001$), 188% ($p < 0.001$), and 14% ($p < 0.05$), respectively. Absolute and relative maximal oxygen uptake increased by 7% and 6%, respectively ($p < 0.01$). These findings indicate that regular hatha yoga practice can elicit improvements in the health-related aspects of physical fitness.

Baldwin (1999) conducted study on psychological and physiological influences of Hatha Yoga training on healthy, exercising adults. The purpose of this study was to explore the psychological and physiological differences between adult exercisers who added a weekly yoga class to their regular exercise 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 exercise habits and maintained exercise 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 Review of Related Literature 49eight weeks, exercise logs were collected and post tests were conducted. 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 exercise, (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.

2.4 STUDIES ON STATIC HATHA YOGA SADHANA

Telles et al. (2004) conducted a study on an evaluation of the ability to voluntarily reduce the heart rate after a month of yoga practice. This study determined whether yoga reduced heart rate and whether the reduction would be more after 30 days of yoga training. Two groups (yoga and control, $n = 12$ each) were assessed on Day 1 and on Day 30. During the intervening 30 days, the yoga group received training in yoga techniques while the control group carried on with their routine. At each assessment the baseline heart rate was recorded for one minute. This was followed by a six-minute period during which participants were asked to attempt to voluntarily reduce their heart rate, using any strategy. Both the baseline heart rate and the lowest heart rate achieved voluntarily during the six minute period were significantly lower in the yoga group on Day 30 compared to Day 1 by a group average of 10.7 beats per minute (i.e., bpm) and 6.8 bpm.

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

Malhotra (2002) experimented on study of yoga asanas in assessment of pulmonary function in NIDDM patients aging 24 of type 2 diabetics. These middle-aged subjects were type II diabetics on anti hyperglycaemic and a dietary regimen. Training in yoga asanas occurred 30-40 min/day for 40 days. There was a significant decrease in fasting blood glucose levels. The postprandial blood glucose levels also decreased. The FEV1, FVC, PEF, MVV increased significantly. Yoga has potential for benefit for patients with CAD. Yoga lifestyle intervention retards progression and increases regression of coronary atherosclerosis in patients with severe CAD. It also improves symptomatic status, functional class and risk factor profile.

Birkel and Edgren (2000) studied on static hatha yoga: improved vital capacity of college students. To determine the effects of yoga postures and breathing exercises on vital capacity, researchers measured vital capacity using the Spiropet spirometer. Vital capacity determinants were taken near the beginning and end of two 17-week semesters. 89 men and 198 women were taught yoga poses, breathing techniques, and relaxation in two 50-minute class meetings for 15 weeks. The study showed a significant improvement in vital capacity across all categories over time.

Telles et al. (1996) “Physiological Measures of Right Nostril Breathing”. This study was conducted to assess the physiological effects of a Yoga breathing practice that involves breathing exclusively through the right nostril. This practice is called Surya Anuloma Viloma Pranayama (SAV). Twelve volunteers took part on two consecutive days. The test sessions were conducted on two consecutive days. One day the test session involved practicing SAV Pranayama for 45 minutes (SAV session). During the test period on the Review of Related Literature 50 Other day subjects were asked to breathe normally for 45 minutes (NB session). For half the patients (randomly chosen) the SAV session was on the first day and NB session on the next day. For the remaining six patients the order of the two sessions was reversed. After the SAV session (but not after NB) there was a significant ($P < .05$, paired t – test two tailed) increase in oxygen consumption (17%) and in systolic blood pressure (mean increase 9.4 mm Hg). The latter two changes are interpreted to be the result of increased cutaneous vasoconstriction. These findings show that SAV has a sympathetic stimulating effect. This technique and other variations of unilateral forced nostril breathing deserve further study regarding therapeutic merits in a wide range of disorders.

Schell et al. (1994) conducted a study on physiological and psychological effects of static Hatha-Yoga exercise in healthy women. They measured heart rate, blood pressure, the hormones cortisol, prolactin and growth hormone and certain psychological parameters. There were no substantial differences between the yoga practicing group and a control group concerning endocrine parameters and blood pressure. The course of heart rate was significantly different; the yoga group had a decrease during the yoga practice.

Telles et al. (1993) “Improvement in Static Motor Performance Following Yogic Training of School Children”. Two groups of 45 children each, whose ages ranged from 9 to 13 years, were assessed on a steadiness test, at the beginning and again at the end of a 10-day period during which one group received training in Yoga, while the other group did not. The steadiness test required insertion and holding for 15 sec. a metal stylus without touching the sides of holes of decreasing sizes in a metal plate. The contacts were counted as ‘errors’. During the 10-day period, one group (the ‘Yoga’ group) received training in special physical postures (Asanas), voluntary regulation of breathing (Pranayama), maintenance of silence, as well as visual focusing exercise (Tratakas) and games to improve the attention span and memory. The other group showed a significant (Wilcoxon’s paired signed-ranks test) decrease in errors, whereas the ‘control’ group showed no change.

Makwana et al. (1988) conducted a study on effect of short term syatic yoga practice on ventilatory function tests. Twenty five normal male volunteers undergoing a ten week yoga course were assessed by ventilatory function tests. The observations recorded at the end of ten weeks of the course showed improved ventilatory functions in the form of lowered respiratory rate, increased forced vital capacity, FEV1, maximum breathing capacity and breath holding time, while tidal volume and %FEV1, did not reveal any significant change.

Singh (2010) compared the isometrics, yogic physical culture and combination training on body composition and physical fitness status of high school boys. Results of this study have shown that all the three exercise groups showed a significant increase in toe-touching scores. The inter group differences show that yogic physical culture is more helpful in developing flexibility than the isometric and combination groups. And in dynamic flexibility, comparatively yogic exercises were the best in developing dynamic flexibility. Gore and Bhole (1982) conducted study on Heart Rate during Paschimottanasana and similar type of isotonic exercises. Heart rate increased by 32% when Paschimottanasana was practiced with an isometric base, by 13% when it was repeated four times with an isotonic base and only by 6% when it was performed in a relaxed manner as a posture for one minute each.

Bhole (1979) conducted a study on Inspiratory volume and Breath-Holding Time in Pranaymic Breathing in Difference conditions of the Abdominal Wall. No

significant difference was found in the inspiratory volume (3375ml) and breath holding time (25seconds) in Pranaymic breathing with protracted relaxed and controlled conditions of the abdominal wall but the feelings varied to a great extent. Bhole (1979) conducted a study on Inspiratory volume and Breath-Holding Time in Pranaymic Breathing in Difference conditions of the Abdominal Wall. No significant difference was found in the inspiratory volume (3375ml) and breath holding time (25seconds) in Pranaymic breathing with protracted relaxed and controlled conditions of the abdominal wall but the feelings varied to a great extent. Improvement in Static Motor Performance Following Yogic Training of School Children”. Two groups of 45 children each, whose ages ranged from 9 to 13 years, were assessed on a staidness test, at the beginning and again at the end of a 10-day period during which one group received training in Yoga, while the other group did not. The steadiness test required insertion and holding for 15 sec. a metal stylus without touching the sides of holes of decreasing sizes in a metal plate. The contacts were counted as ‘errors’. During the 10-day period, one group (the ‘Yoga’ group) received training in special physical postures (Asanas), voluntary regulation of breathing (Pranayama), maintenance of silence, as well as visual focusing exercise (Tratakas) and games to improve the attention span and memory. The other group showed a significant (Wilcoxon’s paired signed-ranks test) decrease in errors, whereas the ‘control’ group showed no change.

2.5 STUDIES ON SOCIO ENVIRONMENT

Nicole Larson & Mary Story (2009) conducted a study on a review of Environmental Influences on Food Choices Diet-related environmental and policy interventions are being advocated at a population level because individual change is more likely to be facilitated and sustained if the environment within which choices are made supports healthful food options. This study aims to review research that examines factors having an influence on food choices in social environments, physical environments, and macro-environments. A snowball strategy was used to identify relevant peer-reviewed studies and reviews, with a focus on research completed in the US and published within the past 10 years. Research has identified a number of environmental factors associated with dietary intake; however, the majority of completed studies have methodological limitations which limit their credibility to guide

interventions and policy changes. Future research will need to emphasize multilevel investigations, examine how associations vary across population subgroups, develop a standard set of measures for assessing food environments and policies, and improve dietary assessment methodology.

Julia A. Graberc et al. (2008) conducted a study on the antecedents of menarcheal Age: Heredity, Family Environment, and Stressful Life Events Variations in pubertal timing, specifically age at menarche, have been associated with several antecedents, both genetic and environmental. Recent research has considered a broader range of environmental stressors and their influence on the development of the reproductive system. In this investigation, the following possible antecedents were considered: (a) hereditary transmission, (b) weight and weight for height, (c) stressful life events, (d) family relations, (e) absence or presence of an adult male in the household, and (f) psychological adjustment. Subjects were 75 premenarcheal girls between the ages of 10 and 14 drawn from a larger longitudinal investigation of adolescent development. Girls were from white, well-educated, middle- to upper-middle-class families and attended private schools in a northeastern urban area. While breast development, weight, family relations, and depressive affect were predictive of age at menarche, family relations predicted age at menarche above the influence of breast development or weight. A trend for maternal age at menarche to predict adolescent's age at menarche was found. Weight for height, presence of an adult male in the household, and stressful events were not predictive of age at menarche. These complex interactions of biological and psychosocial development demonstrated here may account to some extent for the inter- and intra individual variation observed in pubertal development.

Amy F. Feldman and Jennifer L. Matjasko (2005) conducted a study on the Role of School-Based Extracurricular Activities in Adolescent Development: A Comprehensive Review and Future Directions. This article reviews the contemporary literature on school-based activity participation, focusing on patterns of participation, academic achievement, substance use, sexual activity, psychological adjustment, delinquency, and young adult outcomes. Also, the authors discuss possible mediators and moderators of extracurricular activity participation in regard to adolescent development. The review indicates that the associations between school-based activity participation and these outcomes are mostly positive but that the picture becomes

mixed once moderator variables are included. The authors suggest areas for future research that include using new methods for measuring activities and applying an overarching theoretical framework to investigations of extracurricular activities and adolescent development. Finally, to move toward a causal model of activities and adolescent functioning, future research must consider the mechanisms through which activities exert their influence on development. The authors propose several possible mechanisms of participation in terms of adjustment during adolescence and young adulthood.

Heather Patrick (2005) conducted a study on a review of Family and Social Determinants of Children's Eating Patterns and Diet Quality with the growing problem of childhood obesity, recent research has begun to focus on family and social influences on children's eating patterns. Research has demonstrated that children's eating patterns are strongly influenced by characteristics of both the physical and social environment. With regard to the physical environment, children are more likely to eat foods that are available and easily accessible, and they tend to eat greater quantities when larger portions are provided. Additionally, characteristics of the social environment, including various socioeconomic and socio cultural factors such as parents' education, time constraints, and ethnicity influence the types of foods children eat. Mealtime structure is also an important factor related to children's eating patterns. Mealtime structure includes social and physical characteristics of mealtimes including whether families eat together, TV-viewing during meals, and the source of foods (e.g., restaurants, schools). Parents also play a direct role in children's eating patterns through their behaviors, attitudes, and feeding styles. Interventions aimed at improving children's nutrition need to address the variety of social and physical factors that influence children's eating patterns.

Marla E. Eisenberg, (2005) conducted a study on the role of social norms and friends' influences on unhealthy weight-control behaviors among adolescent girls. Dieting is common among adolescent girls and may place them at risk of using unhealthy weight-control behaviors (UWCBs), such as self-induced vomiting, laxatives, diet pills, or fasting. Research has suggested that social factors, including friends and broader cultural norms, may be associated with UWCBs. The present study examines the relationship between the school-wide prevalence of current weight loss efforts among adolescent girls, friends' dieting behavior, and UWCBs, and investigates

differences in these associations across weight categories. Survey data were collected in 31 middle and high schools in ethnically and socio-economically diverse communities in Minnesota, USA. The response rate was 81.5%. Rates of UWCBs were compared across the spectrum of prevalence of trying to lose weight and friends' involvement with dieting, using χ^2 analysis and multivariate logistic regression, controlling for demographic factors and clustering by school. Girls with higher body mass index (BMI) were more likely to engage in UWCBs than those of lower BMI. Multivariate models indicated that friends' dieting behavior was significantly associated with UWCBs for average weight girls (OR=1.57, CI=1.40–1.77) and moderately overweight girls (OR=1.47, CI=1.19–1.82). The school-wide prevalence of trying to lose weight was significantly, albeit modestly, related to UWCBs for average weight girls (15th–85th percentile; OR=1.17, CI=1.01–1.36), and marginally associated for modestly overweight girls (85th–95th percentile; OR=1.21, CI=.97–1.50), even after controlling for friends' dieting behaviors. The social influences examined here were not associated with UWCBs among underweight (<15th percentile) or overweight (>95th percentile) girls. Findings suggest that social norms, particularly from within one's peer group, but also at the larger school level may influence UWCBs, particularly for average weight girls. Implications for school-based interventions to reduce UWCBs are discussed.

Mary Story et al. (2002) conducted a study on individual and environmental influences on adolescent eating behaviors food choices of adolescents are not consistent with the Dietary Guidelines for Americans. Food intakes tend to be low in fruits, vegetables, and calcium-rich foods and high in fat. Skipping meals is also a concern among adolescents, especially girls. Factors influencing eating behaviors of adolescents need to be better understood to develop effective nutrition interventions to change eating behaviors. This article presents a conceptual model based on social cognitive theory and an ecological perspective for understanding factors that influence adolescent eating behaviors and food choices. In this model, adolescent eating behavior is conceptualized as a function of individual and environmental influences. Four levels of influence are described: individual or intrapersonal influences (eg, psychosocial, biological); social environmental or interpersonal (eg, family and peers); physical environmental or community settings (eg, schools, fast food outlets, convenience stores); and macrosystem or societal (eg, mass media, marketing and advertising, social and cultural norms).

Block J (1998) conducted a study on Drug usage in early adolescence (age 14) was related to concurrent and pre-school personality characteristics for a sample of 54 girls and 51 boys. The personality concomitants and antecedents of drug use differed somewhat as a function of gender and the drug used. At age 14, for both sexes, the use of marijuana was related to ego under control, while the use of harder drugs reflected an absence of ego-resiliency, with under control also a contributing factor. At ages 3/4, subsequent adolescent drug usage in girls related to both under control and lower ego-resiliency. In boys, adolescent drug usage related strongly, during their nursery school years, to under control and with resiliency having no long-term implications. Early family environment related to adolescent drug usage in girls but not in boys. Drug usage in adolescent girls was related to homes earlier identified as unstructured and laissez-faire, where there was little pressure to achieve. Drug usage related to other substance use and, in boys, to IQ decline from age 11 to age 18. Implications of these results for contemporary views regarding adolescent drug usage are discussed.

Keenan Kate et al. (1997) conducted a study on developmental and social influences on young girls' early problem behavior. A developing body of research suggests that there are few sex differences in the rate and severity of problem behavior in early childhood, but clear sex differences emerge at about 4 years of age. The authors explore 2 hypotheses to further the understanding of emerging sex differences in problem behavior across the first 5 years of life. The first posits that the change in girls' problem behavior from infancy to school entry represents a channeling of early problem behavior into predominantly internalizing problems as a result of socialization. The second hypothesis is that the change in girls' early problem behavior during the preschool period results from the more rapid biological, cognitive, and social-emotional development of girls relative to boys. The authors review research on the influence of parents, teachers, and peers on girls' behavior from infancy to preschool regarding the first hypothesis, whereas they review studies of sex differences in developmental processes to test the second. They find moderate support for both hypotheses and present a comprehensive theory of girls' developmental psychopathology that integrates social and developmental influences.

Michael Lewis (1984) Conducted a study on predicting psychopathology in Six-Year-Olds from Early Social Relations. 113 children were seen at 1 and 6 years of age in order to examine the relationship between the quality of the early attachment

relationship and later psychopathology. On the basis of scores from the Achenbach and Edelbrock Child Behavior Profile, an outcome measure of psychopathology at 6 years, the results indicated different outcomes for male and female children. For males, attachment classification at 1 year was significantly related to later psychopathology; insecurely attached males showed more psychopathology than securely attached males. No relationship between attachment and later psychopathology was observed for females. Even for males, the attachment classification only partly predicted later behavioral problems. Several other factors, including life-stress events and family demographic variables, appeared to influence the development of psychopathology. The findings suggest that although the child's attachment relationship plays an important role in the development of psychopathology, the child is neither made invulnerable by an early secure attachment nor doomed to psychopathology by an insecure attachment.

2.6 SUMMARY ON THE RELATED LITERATURE

The investigator has compiled and reviewed the literature and professional reviews related to pubertal development, pubertal dimension among preteen girls, dynamic hatha yogic sadhana, static hatha yoga sadhana, socio environment from the library of Tamil Nadu Physical Education Sports University and the material available on the internet to gain sufficient knowledge related to this research work.

The review shows that there is a positive impact in hatha yogic practice on socio-environmental and pubertal development dimensions among pre-teen girls. Based on the yoga studies review, the researcher has chosen this topic as well as the reviews supported on this study and since this is a new research study done on pre-teen girls through Hatha yoga practice in dynamic and static, there is no related research reviews based on this study. The investigator formulated suitable methodology in this research that is presented in Chapter III.