CHAPTER 2

REVIEW OF RELATED LITERATURE

The study of relevant literature is an essential step to get a clear idea of what has been done, with regard to the problem under study. Such a review brings about a deep and clear perspective of the overall field. The research for reference material is a time consuming but fruitful phase of the research programme. A familiarity with the literature in any problem area helps the students to discover what is already known, what others have attempted to find out, what methods have been promising disappointing, and what problems remain to be solved.

The literature in any field forms the foundation upon which all future work will be built.” The reviews of literature are generally used as a basis for inductive reasoning for locating and synthesizing all the relevant literature on a particular topic. A serious and scholarly attempt has been made by the scholar to go through the related literature and a brief review of the studies related to the present problem is described in this chapter.

The present chapter covers the available literature pertaining to the present study on three headings as follow:

1. Reviews related to Psychological parameters
2. Reviews related to Physiological parameters.
3. Reviews related to Dance aerobics & aerobics exercises

2.1 Reviews related to Psychological parameters

Gillian Burgess, (2005)¹ in his study “Effect of six weeks aerobic dance intervention on body dissatisfaction and physical self perception in adolescent girls” examining the impact of physical activity on body dissatisfaction and physical self perception has been both limited and equivocal. The current research investigated the effect of six weeks’ aerobic dance on these variables with 50 British school girls aged between 13-14 years. A cross over design was used with two equivalent groups taught normal physical education and aerobic dance in different order. The body attitude questionnaire (BAQ) and children and youth physical self perception profile

(CY-PSPP) were administered as pre, mid, and post test to each participant in each group before the first intervention, at the change over and after 12 weeks. The result of this study revealed that participation in six weeks’ of aerobic dance significantly reduce body dissatisfaction and enhanced physical self perception although these improvements were not sustained.

McInman, A. D., Berger, B. G. (1993)\(^2\) studied Self-concept and mood changes associated with aerobic dance. This study examined relationship between short-term changes in self-concept and mood associated with aerobic dance participation. Female aerobic dance participants \(n = 75\) and female university students \(n = 42\) completed multidimensional measures of mood (Profile of Mood States; Shacham, 1983) and selfconcept (Self-Description Questionnaire III; Marsh, 1992) before and after their respective activities. Analyses revealed significant positive changes for aerobic dance participants on specific dimensions of mood, whereas controls showed minimal changes. Similar analyses for self-concept revealed significant, but weak changes on 10 of 13 scales by aerobic participants. Controls showed one positive and one negative change. Neither extent of mood change, nor social physique anxiety mediated changes in self concept. Generally, correlations between self concept and mood scales when not high, although emotional stability self-concept, physical appearance self-concept, and global self-concept correlated moderately with specific dimensions of mood.

Mishra, S. R. (2004)\(^3\) studied “Yoga for body image and self concept in varsity of women.” In a time series experiment, fifty \(n=50\) young women age 20-24 years, from the post-graduate department of Utkal University, participated actively. This was a longitudinal study conducted for a period of two years. Pretest, posttest, and follow up tests on self concept and body image were conducted after a yoga training intervention for three months in first year, where the follow up was continued in second year. The result of ‘t’-test revealed that yoga practices have a definite impact on own body image and self concept in varsity of women.


Debra, J. C., Marc, R. L., & Daniel, M. L. (2004) studied the psychological well-being has been generally associated with vigorous aerobic activity and structured aerobic activity in adolescents and children. Low-income children are at greater risk than the general population for experiencing high environmental stress and increased mental health problems. This study investigated the effects of a structured physical fitness program on psychological well-being in low-income Hispanic children. A total of 66, 33 girls, 33 boys, in Grade 4 were randomly assigned to either an Aerobic intensity ($n = 34$) or a Control intensity physical activity program ($n = 32$) for 6 wk. Psychological well-being was defined as scores on trait anxiety, depression, and self-esteem, measured, respectively, by the Trait Anxiety Inventory, Beck Depression Inventory, and Rosenberg Self-esteem scale. Analysis showed the children in the Aerobic intensity program significantly ($p < .05$) improved their cardiovascular fitness as measured by the PWC test. After the program was over, the children in this aerobic group reported significantly ($p < .05$) less depression. The main effect for self-esteem reflected the Aerobic group's greater self-reported self-esteem. No differences were found on trait anxiety. The effects on depression and self-esteem may only be attributed to the cardiovascular improvement given the higher intensity physical activity program because causation was not assessed here.

Mellor, D. (2010) studied Body dissatisfaction and body image disorders are becoming increasingly prevalent in developing non-Western countries such as China, but there is a lack of research examining the sociocultural factors that in other contexts have been associated with these problems. The current study investigated body dissatisfaction, engagement in body change behaviors, and sociocultural pressures on body image, and the relationships between these variables among 517 adolescent males ($N = 219$) and females ($N = 298$) in China. Females reported greater body dissatisfaction than males, and males reported using strategies to increase their muscle bulk more often than females. Males reported pressure from a variety of sociocultural sources to increase their muscles or weight, while females reported pressure from the media to lose weight. For males body dissatisfaction was predicted by pressure from peers to increase their muscle bulk, while for females pressure to

---


lose weight from peers, adult relatives, and the media was likely to increase body dissatisfaction. Pressure from the media and adult relatives was also predictive of body change behaviors in both males and females. The findings are discussed in relation to previous research in both Western and non-Western contexts. © 2009 Elsevier Ltd. All rights reserved.

Rodgers, R.F. (2009) studied Effects of parental comments on body dissatisfaction and eating disturbance in young adults: A sociocultural model. This study examined a sociocultural model of the influence of parental comments on body shape and eating concerns among males and females. Questionnaires were completed by 338 undergraduates. Participants reported levels of perceived parental comments, internalization of media ideals, appearance comparison, body dissatisfaction, drive for thinness and bulimia. Results revealed that, regardless of gender, internalization and appearance comparison only partially mediated the relationship between parental comments and the outcome variables. The final model for females explained a larger proportion of the variability in body shape and eating concerns than in males, with positive and negative parental comments directly related to body dissatisfaction and through it to eating outcomes. In males, only negative comments were directly related to body dissatisfaction. These findings highlight the role of parental influences in sociocultural models of the development of body dissatisfaction and eating concerns and the gender-specific patterns of sociocultural influence.

Trisha, M.K. (2010) in their study “Sport type and interpersonal and intrapersonal predictors of body dissatisfaction in high school female sport participants.” Through multiple group structural equation modeling analyses, path models were used to test the predictive effects of sport type and both interpersonal (i.e., mothers’ body dissatisfaction, family dynamics) and intrapersonal factors (i.e., athletic self-efficacy, body mass index [BMI]) on high school female sport participants’ (N=627) body dissatisfaction. Sport types were classified as esthetic/lean (i.e., gymnastics), non-esthetic/lean (i.e., cross-country), or non-esthetic/non-lean (i.e., softball). Most participants reported low body dissatisfaction, and body dissatisfaction

---


did not differ across sport types. Nevertheless, mothers’ body dissatisfaction was positively associated with daughters’ body dissatisfaction for non-esthetic/lean and non-esthetic/non-lean sport participants, and high family cohesion was predictive of body dissatisfaction among non-esthetic/lean sport participants. Across sport types, higher BMI was associated with greater body dissatisfaction, whereas greater athletic self-efficacy was associated with lower body dissatisfaction. These findings highlight the complex relationship between interpersonal and intrapersonal factors and body dissatisfaction in adolescent female sport participants.

Kaur R., Singh A. K., Javed A. (2003) in their study “Body Image and Depression among Adolescents” test the hypothesis that the poor body image would be strongly correlated (positively) with depression in case of female adolescents than male adolescents. The sample of the study consisted of 300 adolescents (150 males, 150 females) studying in IX, X, XI and XII grades of different schools/colleges of Chandigarh. To study the depressive tendencies, Beck Depression Inventory (1978) for body image of adolescents, and Multi-dimensional Body Self-Relation Questionnaire (MBSRQ) by Cash (1991) were used. ‘Our body ourselves’ is a poignant theme during adolescence. The dramatic bodily changes during puberty set in motion comprises of an important stage in self-development and integration of sexual maturity into the totality of self-experience. The changing body provides powerful stimulus to self and others. Many new perceptions, new thoughts and new feelings about the body have to be confronted, mastered and integrated with the unfolding sense of self during adolescence. The study partially confirmed that females are more conscious than males so far as weight consciousness and appearance were concerned. Most of the correlates of body image were found to be negatively correlated with depression. Thus, results of the study would have practical implications in terms of providing insight to formulate certain intervention programmes for promoting right value system among adolescents.

Dixit, S., et al. (2011) Perceived body image is an important potential predictor of nutritional status. Body image misconception during adolescence is unexplored field in Indian girls. Purpose was to study the consciousness of adolescent girls about their body image. This multistage observational study was conducted on

---


586 adolescent girls of age 10-19 years in Lucknow district (151 from rural, 150 from slum, and 286 from urban area) of Uttar Pradesh, India. Information on desired and actual body size was collected with the help of pre designed questionnaire. 20.5% of studied girls show aspiration to become thin, who already perceived their body image as too thin. 73.4% adolescent girls were satisfied with their body image, while 26.6% were dissatisfied. The dissatisfaction was higher among girls of urban (30.2%) and slum (40.0%) areas in comparison to rural (22.5%) area. Percentage of satisfied girls was less in the 13-15 years (69.9%) age groups in comparison to 10-12 years (76.5%) and 16-19 years (76.4%). Among girls satisfied with their body image, 32.8% girls were found underweight, and 38.4% were stunted. Underweight girls (42.1%) and stunted girls (64.9%) were higher in number within satisfied girls of slum area. Among all of these adolescent girls, 32.8% of girls had overestimated their weight, while only 4.9% of girls had underestimated their weight. This study concludes that desire to become thin is higher in adolescent girls, even in those who already perceived their body image as too thin.

Calfas, K.J. & Taylor, W.C. (1994)\textsuperscript{10} studied to identify the most consistent relationships among psychological variables and physical activity in youth (ages 11-21 years), 20 articles on depression, anxiety, stress, self-esteem, self-concept, hostility, anger, intellectual functioning, and psychiatric disorders are reviewed. Physical activity was consistently related to improvements in self-esteem, self-concept, depressive symptoms, and anxiety/stress. The effect sizes were +.12, -.15, and -.38 for self-esteem/self-concept, stress/anxiety, and depression, respectively. The evidence for hostility/anger and academic achievement was inconclusive. No negative effects of physical activity were reported. The literature suggests that physical activity in youth is psychologically beneficial. More research is needed to confirm previous findings. Adolescents should engage in moderate or vigorous aerobic activity approximately three times per week for a total of at least 60 minutes per week. The authors find moderate support for the existence of a positive relationship between physical activity and various psychological outcomes, in particular, an increase in self-esteem and a decrease in stress/anxiety and depression. Very little evidence was available which explores links between physical activity and hostility/anger or

academic achievement/intellectual functioning. Although no studies reported negative
effects of physical activity the potential for this is mentioned.

McInman, A.D. & Berger, B.G. (1993)\textsuperscript{11} Studied the Self-Concept and Mood
Changes Associated with Aerobic Dance. This study examined relationships between
short-term changes in self-concept and mood associated with aerobic dance
participation. Female aerobic dance participants \((n = 75)\) and female university
students \((n = 42)\) completed multidimensional measures of mood (Profile of Mood
States; Shacham, 1983) and self-concept (Self-Description Questionnaire III; Marsh,
1992) before and after their respective activities. Analyses revealed significant
positive changes for aerobic dance participants on specific dimensions of mood,
whereas controls showed minimal changes. Similar analyses for self-concept revealed
significant, but weak changes on 10 to 13 scales by aerobic participants. Controls
showed one positive and one negative change. Neither extent of mood change, nor
Social Physique Anxiety, meditated changes in self-concept. Generally, correlations
between self-concept and mood scales were not high, although emotional stability
self-concept, physical appearance self-concept, and global self-concept correlated
moderately with specific dimensions of mood.

Stein, P.N. & Motta, R.W. (1992)\textsuperscript{12} studied the effects of aerobic and
nonaerobic exercise on depression and self-concept were investigated in a pre-
test/post-test control group design. Eighty nine undergraduates engaged in the aerobic
exercise of swimming, the nonaerobic exercise of weight training, or a control,
Introductory Psychology class. Dependent measures were the Beck Depression
Inventory, Depression Adjective Check Lists, Tennessee Self-concept Scale, and
Cooper's 12 Minute Swim. Analysis indicated that both the aerobic and nonaerobic
groups were equally effective in significantly reducing self-reported depression in
comparison to the controls. The nonaerobic condition was superior to the aerobic
condition for enhancing self-concept. These results contradict earlier findings
suggesting that only aerobic types of exercise yield psychological benefit but are
consistent with more recent findings showing the psychological benefits of
nonaerobic exercise.

\textsuperscript{11} McInman, A.D., & Berger, B.G. (1993). Self-Concept and Mood Changes Associated with Aerobic
\textsuperscript{12} Stein, P.N. & Motta, R.W. (1992). Effects of Aerobic and Nonaerobic Exercise on Depression and
Joshi, S., Srivastava, R. (2009) the present study was undertaken to investigate the self-esteem and academic achievement of urban and rural adolescents, and to examine the gender differences in self-esteem and academic achievement. The sample of this study consisted of 400 adolescents (200 urban and 200 rural) from Varanasi District. The boys and girls (aged 12 to 14) were equally distributed among the urban and rural sample. Self-esteem was measured by Self-esteem questionnaire and academic achievement was measured by academic school records. The findings indicated that there were no significant differences with regard to self-esteem of rural and urban adolescents. There were significant differences with regard to academic achievement of rural and urban adolescents. Urban adolescents scored higher in academic achievement as compared to rural adolescents. Boys would score significant higher on self-esteem as compared to girls. Significant gender differences were found in academic achievement. Girls were significantly higher on academic achievement as compared to boys.

Rattan, N.; Kang, S.; Thakur, N.; Parthi, K. (2006) The current society emphasizes physical appearance and physical fitness. Individual’s self-esteem has been shown to be linked with physical appearance. Methods: A random sample comprising of 100 male and 100 female (N=200) adolescents was selected. The subjects were administered the Current Thoughts Scale and the Dieting Beliefs Scale for assessing their state self-esteem and their weight locus of control. Results: Boys had significantly higher appearance self-esteem than girls, while girls had significantly higher dieting belief in comparison to boys. Performance self-esteem was positively and significantly correlated with social self-esteem and appearance self-esteem in the total sample, and the sub-samples comprising of boys and girls.

Daniel, C. et al. (2005) In Western cultures, girls’ self-esteem declines substantially during middle adolescence, with changes in body image proposed as a possible explanation. Body image develops in the context of sociocultural factors, such as unrealistic media images of female beauty. In a study of 136 U.K. girls aged

---


11–16, experimental exposure to either ultra-thin or average-size magazine models lowered body satisfaction and, consequently, self-esteem. Self esteem was also lowering among older than among younger girls. Structural equation modeling showed that this age trend was partially accounted for by a corresponding downward trend in body satisfaction; this, in turn, was fully accounted for by upward age trends in awareness and internalization of sociocultural attitudes toward appearance, and in social comparison with media models. Results support calls for early educational interventions to help girls to deconstruct advertising and media images.

Schmidt, C. et al. (2000)\textsuperscript{16} this article considers the relation between overweight and the self-concept of children and adolescents in different living areas. The visibility and perceived controllability of obesity is considered. Results of previous studies about this topic are inconsistent. Self-esteem as one aspect of the self concept is measured by the "list of statements for children and adolescents". Comparing a group of obese (N = 56) with a group of children and adolescents who suffered from other chronic illnesses (N = 22), the obese had a lower self esteem for the public living areas "school" and "leisure time", but not for the private area "family". A further result shows that the visibility of the illness is significantly related to self-esteem; again this relation is only revealed for the public living areas "school" and "leisure time".

Lau, P. W. et al. (2006)\textsuperscript{17} Given study investigate between actual and ideal body size rating to Chinese children’s global self-esteem and global physical self concept. It was a cross sectional study of school children who completed questionnaires related to global self-esteem, global physical self-concept and actual v/s ideal body size. Total of 386 Chinese children (44% girls and 56% boys) aged 7-13 years from a primary school in Hong, China were subjects for the study. Global self self-esteem and physical self-concept were measured using the physical self-descriptive questionnaire. Actual vs. ideal body size discrepancy was established using the silhouette matching task. No significant relationship was found between global self-esteem and actual-ideal body size discrepancy of children. Global physical self-concept had a moderate negative correlation (r=-0.12) with the body size


discrepancy score and the discrepancy score explained very limited variance (R2=0.015; F(1, 296)=4.51; P<0.05) in global physical self-concept. Three body size discrepancy groups (none, positive, and negative) were examined to see if there were any significant differences in global self-esteem, global physical self-concept, and specific dimensions of physical self-concept. A significant overall difference was found between groups for global physical self-concept (F=3.73, P<0.05) and the physical self-concept subscales of physical activity (F=3.25, P<0.05), body fat (F=61.26, P<0.001), and strength (F=5.26, P<0.01). Boys scored significantly higher than girls on global physical self-concept - especially in the sport competence, strength, and endurance subscales. This study revealed that the actual-ideal body size discrepancy rating of Chinese children was not predictive of global physical self concept and global self-esteem. These findings are contrary to those reported in Western children, which may mean that culture plays a role in the formation of body attitude.

**Sue, E. B. et al (2009)**\(^{18}\) The purpose of this study was to examine the accuracy of college students Body Mass Index scores and whether student’s physical self concept scores differed according to their perceived weight status classification. Total of 192 students completed the physical self description questionnaire and self reported their height, weight and weight status classification. Actual height and weight measurement were also obtained. Analysis showed females had significantly higher actual than self-reported BMI scores (t=2.16, df= 125, P< 0.05), but not males. Significant difference was found between both males and females in physical self-concept scores based on their height weight category. Results suggested that males, but not females, accurately reported their height and weight scores, but neither gender tended to accurately identify their weight status. Females and males who perceived themselves to be normal weight reported the highest physical self-concept scores.

**Jennifer, A. et al (1999)**\(^{19}\) studied the effects of gender, puberty, and body weights on the self-concept of young adolescents have been addressed in the literature. In studies of Australian and American adolescents, gender differences in several aspects of self-concept have been found. Studies showed that males scored

---


higher in regard to physical ability, physical appearance, mathematics, emotional stability, problem solving, and general self-esteem. Females scored higher on verbal and reading competency, school-related self-concept, honesty/trust worthiness, and religious/spiritual values. These gender differences were consistent with traditional sex stereotypes. Male adolescents scored higher than the females on all categories of self-concept except for behavioral conduct. Several studies have shown that pubertal development is related to physical self concept, with early-developing females having a less positive body image than their on-time and late-maturing peers. Among males, the opposite is true, with early maturation being linked to a positive body image and late maturation being associated with dissatisfaction with the physical self.

Richard, S. S. (2000) In the given study a total of 1520 children, 9 to 10 years of age, born to mothers in the National Longitudinal Survey of Youth were selected. Comprehensive demographic data including race and family income were available in 97% of the cohort. Self-esteem was measured using Self-Perception Profile for Children. The 4-year follow-up Self-Perception Profile for Children scores was available in 79% of the children. Obesity was defined as a body mass index greater than the 95th percentile for age and gender. Additional data include a self-administered questionnaire at 13 to 14 years of age concerning emotional well being, smoking, and alcohol consumption. Data were stratified by race and gender. The data were weighted to reflect a nationally representative sample of children born to mothers 17 to 28 years of age. The result showed that Scholastic and global self-esteem scores were not significantly different among 9- to 10-year-old obese and non obese children. However, over the 4-year period, Obese Hispanic females and obese white females showed significantly decreased levels of global self-esteem compared with non obese Hispanic females and non obese white females, respectively. Mild decreases in self-esteem also were observed in obese boys compared with non obese boys. As a result, by 13 to 14 years of age, significantly lower levels of self-esteem were observed in obese boys, obese Hispanic girls, and obese white girls compared with their non obese counterparts. Decreasing levels of self esteem in obese children were associated with significantly increased rates of sadness, loneliness, and nervousness compared with obese children whose self esteem increased or remained

unchanged. In addition, obese children with decreasing levels of self-esteem over the 4-year period were more likely to smoke and drink alcohol compared with obese children whose self-esteem increased or remained unchanged. Obese Hispanic and white females demonstrate significantly lower levels of self-esteem by early adolescence. In addition, obese children with decreasing levels of self-esteem demonstrate significantly higher rates of sadness, loneliness, and nervousness and are more likely to engage in high-risk behaviors such as smoking or consuming alcohol.

**Jennifer, A. O. (2006)** Twenty girls aged 12.8 (0.6) years, completed self-concept, depression and anxiety scales over three years and had their height and weight measured. All nine self-concept domains were lower in the Highest BMI group, compared to the Lower BMI group and this trend was stable over three years. Highest BMI girls were substantially lower than population norms on all nine scales. Over three years, the Physical Appearance and Close Friendship scores of Highest BMI girls decreased compared to Lower BMI girls. This pattern was similar for all of the other self-concept domains. Several aspects of early adolescent girls' self-image may be adversely influenced by a heavy weight status.

**Jan, L. W. et al. (2008).** This study examined the association between weight status and quality of life (QOL) in fifth-grade African American, Hispanic, and white children and the potential mediation of this relationship by self-concept. A sample was recruited from fifth-grade public school students in three sites, of whom 599 were African American (40%), Hispanic (34%), or white (26%). During a home interview, physical and psychosocial QOL and global and body-specific self-concept were measured. Measured height and weight were used to calculate BMI. In this sample, 57% were classified by BMI as not overweight, 17%, overweight, and 26%, obese. Although there was no significant interaction between weight classification and race/ethnicity for QOL, obese children reported significantly lower psychosocial but not physical QOL than those classified as not overweight. There was a significant association between BMI (measured continuously) and psychosocial QOL, but only 2% of the variance was accounted for. Both global self-concept and body dissatisfaction independently mediated significant portions of the association between

---


BMI and psychosocial QOL. Being obese in childhood may have negative psychosocial effects.

Marsh, H. W. et al (2007) Childhood obesity is increasingly prevalent in Western and non-Western societies. The authors related multiple dimensions of physical self-concept to body composition for 763 Chinese children aged 8 to 15 and compared the results with Western research. Compared with Western research, gender differences favoring boys were generally much smaller for physical self-concept and body image. Objective and subjective indexes of body fat were negatively related to many components of physical self-concept, but in contrast to Western research were unrelated to global self-esteem and slightly positively related to health self-concept. In support of discrepancy theory, actual ideal discrepancies in body image were related to physical self-concept. However, consistent with the Chinese cultural value of moderation, and in contrast to Western results, being too thin relative to personal ideals was almost as detrimental as being too fat. The results reflect stronger Chinese cultural values of moderation and acceptance of obesity than in Western culture and have implications for social and educational policy in China.

Mzobanz, M. M. (1998) this study aimed to determine the relationships between the self-concept and academic achievement of black and white tenth grade American students. Data on these variables were collected from 440 tenth grade students in the Pacific Northwest School district. Self-concept was measured by the Coppersmith Self-Esteem Inventory (SEI), and academic achievement by the California Achievement Test (CAT). For black students no significant relationship was found between self-concept and academic achievement, although the relationship reached significance for white students. Growing up black in a predominantly white society and the opposite experience are considered in the light of self-concept and academic achievement.

Latha, K.S., Supriya, H. Bhat, S.M., Rai, P. (2006) The purpose of this study was to examine whether Body Mass Index (BMI) and the subjective perception

---


of body weight, and body shape satisfaction predict level of self-esteem and depression among female college students. The sample comprised of 124 female college students ranging in age from 16-21 years. Self perception of having a weight problem was evaluated by open-ended questions and Body Shape Questionnaire. In addition, Rosenberg Self-Esteem Scale and General Health Questionnaire-28 was administered. Based on BMI 29.0% were under weight, 67.8% normal and 3.2% over weight. Rating of self-perception of body shape showed that 38.7% felt that they were slim, 27.4% normal and 26.6% as thin. Eighty six percent of the subjects desired to be slim. The perception of weight problem but not BMI contributed significantly to higher scores on GHQ. There was a significant positive correlation between BSQ scores and BMI, age, and weight. Health care providers need to educate female adolescents about normal weight range, proper diet and exercise. In addition, health care providers need to help them attain a realistic, positive perception of their weight in order to prevent depression and lowered self-esteem.

Michael, W. et al (2007) study examined the relationship between body image discrepancy (BID) scores for actual versus ideal body image for children and indicators of child mental health. Data were collected from 650 5th graders and their parents who participated in the Healthy Passages Phase I study. Participants were recruited through schools in Alabama, California, and Texas. Measures included the Collins Body Image to produce child- and parent-reported child BID scores, respectively, body mass index (BMI) for child and parent, the Strengths and Difficulties Questionnaire (SDQ), and the Positive and Negative Affect Scale for Children (PANAS-C). After controlling for potential confounders, children’s internalizing problems as rated by parents and negative affect as rated by children were significantly associated with discrepancies based on child- and parent-reported child BID scores, respectively. Overall, higher child- and parent reported child BID scores were significantly associated with more internalizing problems and negative affect among children. There were some inconsistencies in the associations between other mental health behaviors and child BID scores contingent on parent or child ratings. Early intervention may be indicated to prevent possible adverse consequences, especially for internalizing problems, from the effects of child- and

parent-reported child BID scores on adolescent and adult mental health and well-being.

2.2 Reviews related to Physiological parameters

McCord, P., Nichols, J., Patterson, P. (1989) studied the effect of low impact dance training on aerobic capacity, submaximal heart rates and body composition of college-aged females. The purpose of this study was to examine the effects of a 12 week program of low impact aerobic dance conditioning on VO2max, submaximal heart rates and body composition of college-aged women. Sixteen women exercised three times per week for approximately 45 minutes per session at 75-85% of their heart rate reserve. VO2max was measured by indirect calorimetry using a treadmill protocol. Submaximal heart rates were measured by electrocardiography, and body fat was assessed by hydrostatic weight. All testing was conducted within one week pre- and post training. Training sessions consisted of a 5-10 minute warm up, 30-35 minute low impact aerobic dance segment and a 5 minute cool down. Posttest results revealed a small (7%), but significant increase in VO2max (pre: 38.3 ml/kg/min; post: 41.3 ml/kg/min, X +/- SD, p less than 0.05). Submaximal heart rates at minutes 2-3, 3-4 and 4-5 of the graded exercise test decreased significantly. Body fat decreased from 25 +/- 6.8% to 21 +/- 6.3% (p less than 0.01) with no post training change in body weight. It was concluded that low impact aerobic dance is as effective as other endurance training regimens in improving cardiovascular fitness and decreasing body fat.

Vatansev, H., Cakmakci, E. (2010). The purpose of study was to determine the effects of 8 weeks aerobik exercise program on body composition and blood lipids of sedentary middle aged women. 29 obese (O) subjects whose mean age was 41.55 ± 6.72 years, mean height: 159.21 ± 7.18 cm, average body weight (BW) : 85.97 ± 9.60 kg, and 29 overweight (OW) subjects whose mean age was: 35.10 ± 9.11 years, mean height: 160.59 ± 5.20 cm and average body weight (BW) was : 68.55 ± 6.72 kg, total 58 individuals taking part in the step aerobic exercise program run by KOMEK(Konya Vocational Course) were included in the study In this research, 8 weekly period- aerobic exercise in 3 days of the week have been applied to people.

---


Before and after the exercise protocol, the body fat percentage (BFP), the rate of the waist to the hip (WHR), elasticity (E), blood lipid parameters (cholesterol, HDL-C, LDL-C, VLDL-C, TRIGLY), blood pressure (SBP), and diastolic blood pressure (DBP) have been measured. In this study, it has been determined that there is a significant difference (p<0.05) between the tests of BW, BFP, BMI, WHR, SBP, and DBP given after an 8-week aerobic-step exercise protocol in favor of the last test. We too have demonstrated in this study that exercises have affected positively BW, BFP, BMI and WHR compatible with other studies. We established in this study that HDL-K increased but triglyceride increased in the overweight and obese groups before and after exercises, and LDL-K decreased in the overweight group (p<0.05). As a result, exercises cause favorable changes in lipids and lipoproteins. Furthermore, diet program in addition to exercise program will provide more prolific results with obese people. It has been proved with the obtained results that the negative effects of sedentary living on individuals are decreased with exercises.

Kemp, C., Pienaar, A.E. (2009) studied the decreasing tendencies of physical activity among adolescent girls are indicated as contributing to increased health risks in this age group. The purpose of this study was to determine whether a 10 week aerobic-based exercise programme performed twice a week, with a 30 minutes duration and an intensity level of 55 – 70% heart rate max would improve aerobic endurance, muscular strength, muscular endurance, flexibility and body composition of 10 – 15 year-old girls living in a farming community. The study involved girls (N=38) from two schools, living on nearby farms in the North West Province. Twenty subjects (n=20) participated in the aerobic-based programme, while eighteen (n=18) served as a control group. The FITNESSGRAMM assessed physical fitness while ACTICAL activity monitors were used to analyse the physical activity intensity level of the group. Co-variance analysis (p < 0.05) showed significant group differences, indicating improvement in aerobic endurance, muscular strength and muscular endurance and improved tone as measured by the triceps skinfold after participating in the aerobic-based exercise programme. It is concluded that an aerobic-based exercise programme, conducted in a playful and enjoyable manner and

according to guidelines set for health enhancement, can improve aerobic endurance, leading to increased physical activity among girls in their teenage years.

**Emre, B. et al (2007)** 30 Aim of the given study was to determine the relationship between body fat percentage (BF %) and body mass index (BMI) and to evaluate the validity of World Health Organization’s BMI cut-off values for obesity. Adult out-patients (n=909,249 men, 660 women), mean age; 40.5 ± 14.1 years were included. According to WHO are BMI criteria, 440 subjects were obese (79 men, 361 women). The BF% of participants was measured using a bioelectrical impedance analysis (BIA) system (TANITA). Randomly selected 30 patients were also subjected to the Dual-Energy X-ray Absorptiometry (DEXA) procedure for evaluation of the validity of TANITA measurements. The BF% results obtained by DEXA and TANITA revealed good correlation (r =0.952, p= 0.382). There was a positive correlation between BF% and BMI (p<0.001) for both methods. Cut-off values for BMI were calculated as 28.0 kg/m2 for women, 28.2 kg/m2 for men, if obesity was defined as BF ≥ 25% in men, ≥ 30% in women according to WHO’s criteria. Using the new cut-off values, the frequency of obesity increased up to 33.9% in our group. The increase was more pronounced in men (67.1% vs 26.6%).The WHO cut-off values underestimated the frequency of obesity in this population.

**Tuckman, b. w.; Hinkle, J. S. (1986)**31 compared the effects of running to those of the normal physical education program among 154, 4th, 5th, and 6th graders who were randomly assigned to conditions. The running program consisted of 3 30-min sessions per week for 12 wks in lieu of attendance in regular physical education classes. Findings show that although boys tended to run faster than girls overall and that older children ran faster than younger children, running Ss performed better on an 800-m run, had lower pulse rates, and performed better on a test of creativity than did regular physical education participants. Running was judged effective for enhancing the cardiorespiratory health and creativity of school children

---

Natasa. (2007) studied “The impact of aerobic training on the morpho motor status in female high-schoolers.” The aim of the study was to analyze the impact of special programmed physical education including dance, aerobics, and rhythmic gymnastics on the development of motor and functional abilities and morphological characteristics of female fourth grade high-schoolers in Zagreb. A total sample of 220 high-schoolers aged 16-18 years were divided into two groups: Experimental group of 115 students attending the program composed of dance structures and aerobics, and control group of 105 students attending classic program of physical education. A set of three morphological variables, six motor variables, and one functional variable were applied in both groups on three occasions during an academic year. Two factor analysis of variances (MANOVA) showed the experimental program to significantly influence the development of coordination ability and specific rhythm coordination, functional aerobic ability, repetitive and explosive strength and flexibility, along with significant reduction of overweight and adipose tissue.

Kostic (2005) compared the effects of two Hi/Lo aerobic models on the cardiovascular fitness of women. The evaluation of cardio-vascular fitness was carried out by means of the following variables: resting heart rate, heart rate under strain, systolic and diastolic arterial blood pressure and absolute and relative oxygen uptake. It was concluded that the effects of both aerobic dance models on cardio-vascular fitness were positive, if the exercise is realized continuously over a longer period of time (three times a week, for 50 minutes), or if the exercise takes place five times a week for 35 minutes.

Tosic, J.S. et al. (2011) studied the effect of kick aerobics on the fitness abilities of female high school students. The aim of our work was to assess the effects of Kick aerobics on the fitness abilities of female high school students. Sixty female students participated in the study. They were engaged in physical education classes twice a week, for four months. 30 students (age 16 ± 0.5 years) participated in the experimental program of Kick aerobics and 30 age matched students were the control group that participated in the official high school physical education program. Fitness

---

abilities were assessed by means of a battery of tests. During the initial measuring, the morphological and fitness status of the participants from the experimental and the control group were similar. In the final examination there was statistically significant difference in the fitness abilities between the two examined groups, in favor of the experimental group. The fitness status of the subjects from both groups changed after four months of training, but the changes were dependent on the type of training program. Both groups experienced an improvement in strength of the lower back and flexibility of hamstrings, but the participants from the experimental group improved the strength of the lower body (thigh strength), while the participants from the control group improved the strength of the upper body (strength of the shoulder belt and arms). In addition, the participants that practiced Kick aerobics improved their shoulder flexibility and cardio respiratory fitness. The Kick aerobics program can be used as an effective tool in physical education, to help the motor skills transformation of high school students.

Arslan, F. (2011) 35 studied the-effects of an eight week step aerobic dance exercise programme on body composition parameters in middle aged sedentary obese women. Regular physical activity leads to significant changes in terms of the reduction of health-related risks. The purpose of this study was to investigate the effects of an eight-week step-aerobic dance exercise programme on weight loss and body composition parameters in middle-aged sedentary obese women. This study comprised an eight-week randomised controlled trial. A total of 49 healthy sedentary obese women participated in this study voluntarily. They were randomly divided into two groups: those undertaking a step-aerobic dance. BMI, weight, waist circumference, waist-hip ratio, four-site skinfold thickness, fat percentage, basal metabolic rate and lean body mass were assessed before and after the completion of the step-aerobic dance exercise programme. After the eight weeks of the step-aerobic dance exercise programme, significant differences were found in the subjects' weight, BMI, body composition parameters, waist-hip ratio (WHR), waist circumference (WC), fat percentage, lean body mass (LBM) and basal metabolic rate (BMR) in the experimental group (p<0.05). There were no significant differences in the control group after the experiment in terms of the same measures (P>0.05). The step aerobic

dance programme proved to be a useful exercise modality for weight loss and in terms of body concise programme (n=29) and a control group (n=20). The subjects too part in a step-aerobic dance exercise programme for one hour per day, three days a week for eight weeks. The subjects’ Body Mass Imposition. There was a clear response to the eight-week step aerobic dance programme in terms of central obesity in sedentary obese Turkish women.

**Akodu, A. K. et al. (2012)** Recreational Physical Activities (RPA) in primary schools enhances the cardiorespiratory, neuromuscular, skeletal and metabolic systems of children. RPA is however declining in these institutions, portending a threat to community and public health. To compare the effect of RPA on body composition among pupils in public and private primary schools in Surulere Local Government area (LGA), Lagos, Nigeria. A total of 400 apparently healthy pupils (200 males and 200 females) aged 7-11 years and recruited from 12 randomly selected public and private schools participated in the study. Availability of RPA facilities was documented in the various schools. Anthropometric variables including height, weight, waist and hip circumferences (WC and HC), triceps, subscapular, and calf skin fold thicknesses were also measured. Body mass index (BMI), waist-hip-ratio (WHR), sum of skinfold thickness (SFT) and percentage body fat (%BF) were calculated and used to determine their body composition. Data was summarized using descriptive statistics of mean and standard deviation and analysed using independent t-test and level of significance was set at p< 0.05. There was significant difference in height, weight, WC, HC, BMI, SFT and %BF (p<0.05) between male and female pupils of both public and private schools and no significant difference in WHR (t=-0.15,p=0.88; t=-0.04,p=0.97) between male and female pupils of public and private primary schools respectively in Surulere, Lagos. 66.7% of the public schools had open fields with no RPA facilities, while 83.33% of the private schools had adequate space with well equipped RPA facilities. The pupils in private schools had a greater proportion of overweight and obesity, even though they had better RPA facilities than those in the public schools.

---

Banitalebi, E. et al. (2010)\textsuperscript{37} the purpose of this study was to determine the effect of exercise training on health-related physical fitness factors and blood lipids profile of former addicted persons. Thirty seven males who were 23-49 years old, and had one-year quitting history were selected and randomized (exercise group, n= 18 and control, n= 19). Thirty eight individuals completed the entire study; 16 persons were in exercise group and 15 persons were in control group. Exercise training was consisted primarily of some game-based aerobic exercise. Exercise training duration progressed from 20 minutes at the baseline to 45 minutes at the end of weeks 12th, and intensity of exercise progressed from 50\% of heart rate reserve of baseline to 70 \% at 12 weeks. Weight, BMI and WHR were measured. Muscle endurance, flexibility and Vo2Peak were measured using by pull up, Sit -and –Rich test and one-mile Rockport walk test, respectively. Body composition was assessed using the sum of three skin-fold measurement specific for males (chest, abdomen, and tight). Total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C) and triglyceride (TG) were measured enzymatically using diagnostic Pars kits. All variables were measured at baseline. Data analyzed by using ANCOVA analysis. There were no significant differences in weight (p=0.208), BMI (P=0.2631), CT (P=0.428), HDL (0.833), LDL (0.396), VLDL (P=0.169), TG (P=0.283), Vo2peak (p=0.884), flexibility (P=0.923) and Pull-up (P=0.44) after 12 weeks exercise training between two groups, but there was significant difference in WHR (p=0.044). It appears that, exercise training can prevent weight gain after quitting drugs and substances.

Arazi, H. et al. (2012)\textsuperscript{38} Aim: The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended and a decrease in physical activity due to the increasingly sedentary persons. This study examined the effects of morning aerobic training on lipid profile, body composition, WHR and VO2 max in sedentary overweight females. Material and Method: 20 overweight (OW) subjects with mean age of 40.2 ± 6.2 years, mean height of 158.70 ± 5.96 cm and mean body weight (BW) of 65.81 ± 7.89 kg, assigned


to training group (n=10) and control group (n=10) randomly. Aerobic Training consisted of 8 weekly period and 6 days per week was applied to subjects. Before and after the training period, the body fat percentage (BF), body mass index (BMI), the waist to hip ratio (WHR), blood lipid parameters (TG, CH, LDL, HDL), VO2Max were measured. Results: The results showed that there were significant differences (p<0.05) between pre and post test values of LDL, HDL, BMI, WHR, VO2Max and weight in the training group. Conclusions: 8-weeks morning aerobic training had significant effect on LDL, HDL, BMI, VO2Max and weight except to TG. It could be concluded that the negative effects of sedentary living on individuals are decreased with morning aerobic training.

Gill, J. S., Sharma, P. K. (2009) The purpose of this study was to find out the difference between obese and non-obese school girls on various physical performance variables. On the basis of body mass index 75 girls of 10 to 18 years of age were selected out of 665 girls’ students of different schools of Chandigarh. On the basis of the body mass index of these subjects three groups namely underweight (BMI=<13.5 kg/m²), normal (BMI=19 to 20 kg/m²) and overweight (BMI=25 to 29.9 kg/m²) were formed. Physical performance of the subjects was evaluated by conducting international physical performance test (ICSSFE, 1985) consisting of 20 meter dash (speed), Push–up 30 seconds (muscular endurance-trunk), medicine ball throw (shoulder power), standing jump (leg power) and 6 minutes run / walk (cardio respiratory endurance) test items. Results indicated that underweight school girls were better than the normal and overweight school girls in physical performance of muscular endurance-upper extremities, muscular endurance-trunk and cardio respiratory endurance. Overweight girls were having better shoulder power although not significantly. Underweight, normal and overweight school girls were having almost equal physical performance in speed, shoulder power and leg power.

Margarita, S.T. et al. (2004) The Purpose of the study was to determine whether physical activity and fitness change in girls with and without a predisposition to obesity from 8 to 10 yr of age. For the study Normal-weight girls (N = 91) were recruited at 8 yr of age according to parental body mass index (BMI): LN = girls with

two lean (BMI < 25 kg·m⁻²) parents, LNOB = girls with one obese and one lean parent, and OB = girls with two obese (BMI > 28 kg·m⁻²) parents. A longitudinal study was undertaken with annual assessments at 8, 9, and 10 yr of age. The primary outcomes were fitness VO²peak measured by treadmill testing, and physical activity measured by heart rate monitoring and by questionnaire. Sedentary behavior was assessed by questionnaire. Results showed that VO²peak (mL·kg⁻¹·min⁻¹) did not change over time; however, VO²peak (L·min⁻¹ and mL·kg⁻¹·min⁻¹), time on the treadmill, and treadmill stage were different across groups (P < 0.02). Girls with LNOB parents had a lower absolute VO² than the LN girls by 2.5 mL·kg⁻¹·min⁻¹ (P < 0.05). The OB group had a 3.9 mL·kg⁻¹·min⁻¹ lower VO² than the LN group (P < 0.001). The girls of LN parents also exercised longer on the treadmill (P < 0.05) than girls with OB parents. The percent of the day spent active on the weekday and weekend did not change over time or between groups. Time spent watching TV during the school year and summer was similar over the study period and between groups.

Sayyed, M.M. et al. (2008) Obesity is a threat to the health of modern urban citizens, especially women. Aerobic is an effect of exercise which rapidly is developing among urban women. This study was designed to examine the effects of light and moderate aerobic intensity on body composition and serum lipid profile in obese/overweight women living in Isfahan. Forty-five middle-aged obese/overweight volunteer women (25-40 years, and body mass index (BMI) ≥25 to 30 kg/m²) were randomly assigned into three groups: 1. Light aerobics [45-50% heart rate reserve maximum (HRRₘₐₓ)], 2. Moderate aerobics (70-75% HRRₘₐₓ), 3. No exercise training (control). Training program lasted for 10 weeks and included three sessions of 60 minutes aerobics per week. The intensity of aerobics was controlled by monitoring heart rate. Body composition was measured using skin fold thickness method. Serum lipid was measured. Both light and moderate aerobics significantly improved weight (P < 0.000), fat percent (P < 0.045), BMI (P < 0.000), fat weight (P < 0.031), lean body weight (P < 0.02), waist-to-hip ratio (WHR) (P < 0.000), High-density lipoprotein (HDL) (P < 0.000). Conclusions: Our findings showed that both light and moderate aerobics improved body composition and serum lipid profile in

obese/overweight women. Our findings support the application of aerobics for obese/overweight women. Initially, they can start with light programs and proceed to more intense programs.

Rowland, T. W. (1991) Obesity, or excess body fat, in adolescents is associated with decreased performance results on tests of aerobic and muscular fitness. This study assessed how obesity affects aerobic fitness in adolescent females. Tests for cardiopulmonary fitness and body fat percentage were performed on 27 female high school students. Subjects were placed into obese or non obese groups, based on body fat test results. Results showed that aerobic fitness levels of the obese subjects were significantly lower than expected with an average maximal oxygen uptake of 30.9 milliliters per kilogram (ml/kg) per minute versus a norm of 40 to 45 ml/kg per minute. Absolute values for oxygen uptake were higher in the obese subjects, but were lower when related to body weight. Oxygen consumption and treadmill time decreased as body fat levels increased. Obesity was not associated with adverse effects on ventilation or the cardiopulmonary system. These results indicate that cardiopulmonary capacity is increased in obese adolescent females, but the excess fat results in a load that decreases performance. Exercise programs prescribed for these individuals should be geared toward increasing calorie expenditure and stimulating weight loss rather than increasing aerobic fitness. Using calories through exercise and losing weight are more important for obese adolescent females than improving aerobic fitness.

Richard, A. et al. (2009) this study examined which aspects of children’s fitness assessment are associated with their performance on four different academic areas. FITNESSGRAM measures aerobic capacity, abdominal strength, upper body strength/ endurance, flexibility, and trunk lift. Gender and a socio-economic status proxies were compared with mean group performance scores across four subscales: mathematics, reading/language arts, science, and social studies of a statewide standardized academic performance test (West Virginia Educational Standards Test-WESTEST) on a sample of 968 5th grade students. Results showed that achievement test scores were significantly better for children who were in the Healthy Fitness Zone (HFZ) for aerobic capacity and abdominal strength tests when compared to children

---

who were unable to achieve the healthy zone. Children in the HFZ for upper body strength preformed significantly better in math. Children in the HFZ for flexibility performed significantly better in math and science. No differences were found in academic performance when children in the HFZ for trunk lift were compared to children not in the healthy zone. Aerobic capacity was found to be only fitness variable significant as a main effect variable while no other main effect fitness variable achieved significance for any WESTEST subject.

Bowden, R.G. et al (2005) the purpose of the study was to examine the validity of body mass index (BMI), bioelectrical impedance (BIA) and skin folds (SF) in predicting body composition when compared to Dual-Energy X-ray Absorptiometry (DEXA). Researchers examined four accepted methods of body composition assessment: BMI, DEXA, SF and BIA. A convenience sample of sedentary college-aged students (N=108) from introductory health classes at a southern university were chosen to participate in a 12-week behavior change study. All measures were obtained by trained technicians with proficiency in each of the body composition measures. Pearson correlations for each comparison were 0.824 for DEXA and SF, 0.798 for DEXA and BIA, and 0.551 for DEXA and BMI. All correlations were significant to p<0.001. Stepwise multiple regression revealed SF as the greatest predictor of DEXA with 67.5% of variance explained (r^2 =0.675) followed by BIA (12.1%) and BMI (2.6%). Total variance explained was 82.2% (R^2 =0.822). Differences in mean body fat percentages are reported but were not significantly different. By combining the findings of the correlations, regression analyses, beta weights and scatter plots, BMI may not be an appropriate measure to assess body fat in college-aged participants.

Anju S. et al. (2007) the present study was conducted to assess the BMI and Body Fat percent among the affluent adolescent girls (n = 794) (9-18 years) and to determine the prevalence of overweight and obesity. All measurements were recorded for two and a half years, at six monthly intervals. The study design was cross linked longitudinal in nature, thus increasing the sample size at the end of the study from 794 to an observational figure of 3970. BMI clubbed with BIA field technique to measure

the adiposity (body fat %) were used to assess the overweight among them. According to CDC BMI criteria, the prevalence of overweight and obesity in affluent adolescent school girls was seen in 13.1% and 4.3% respectively. The actual body fat per cent values for assessing overweight and obesity among the girls was calculated based on cutoffs of 85th and 95th percentile values respectively. The body fat% 85th percentile values for assessing overweight among the girls ranged from 20.7 to 34.1 and 95th percentile values from 25.9 to 41.2 for ages 9 to 17.5 years respectively. Higher velocity of BMI and body fat per cent were also observed during the pubertal period, between 10-12 years among the girls. Finally it was concluded that Overweight is an emerging health problem in adolescent girls belonging to affluent families in Bangalore city.

Bernard Gutin (2002) in his study the “effect of exercise intensity on cardiovascular fitness, total body composition, and visceral adiposity of obese adolescents”, the objectives was to determine the effects of physical training intensity on the cardiovascular fitness, percentage of body fat (%BF), and visceral adipose tissue (VAT) of obese adolescents. Obese 13–16-y-olds (n = 80) were assigned to 1) biweekly lifestyle education (LSE), 2) LSE + moderate-intensity physical training, or 3) LSE + high-intensity physical training. The intervention lasted 8 mo. Physical training was offered 5 d/wk, and the target energy expenditure for all subjects in physical training groups was 1047 kJ (250 kcal)/session. Cardiovascular fitness was measured with a multistage treadmill test, %BF with dual-energy X-ray absorptiometry, and VAT with magnetic resonance imaging. The study results increase in cardiovascular fitness in the high-intensity physical training group, but not in the moderate-intensity group, was significantly greater than that in the LSE alone group (P = 0.009); Compared with the LSE alone group, a group composed of subjects in both physical training groups combined who attended training sessions ≥2 d/wk showed favorable changes in cardiovascular fitness (P < 0.001), %BF (P = 0.001), and VAT (P = 0.029). We found no evidence that the high-intensity physical training was more effective than the moderate-intensity physical training in enhancing body composition.

Crawford, P.B. et al. (2001)47 The objectives of this multisite study were to: (i) examine differences by gender and race on generic and weight-specific health related quality of life (HRQOL) in adolescents with extreme obesity (BMI > or = 40 kg/m(2)) and (ii) explore HRQOL differences based on treatment pursued (behavioral vs. bariatric surgery). Study participants included 145 obese adolescents (mean age = 15.3 years; 68% female; 46% black; mean BMI = 50.6) referred to pediatric weight management programs. Participants completed generic (PedsQL) and weight-specific (Impact of Weight on Quality of Life-Kids (IWQOL-Kids)) HRQOL measures. Generic and weight-specific measures indicated global (e.g., all domains) HRQOL impairment and significant differences by race. Physical, emotional, and social scores of the PedsQL (Ps < 0.01) and the physical comfort and body esteem scores of the IWQOL-Kids (Ps < 0.01) were significantly higher for black compared to white adolescents with extreme obesity. Extremely obese adolescents pursuing bariatric surgery reported similar HRQOL to adolescents pursuing behavioral treatment (n = 30 matched pairs). HRQOL did not differ for extremely obese adolescents based on type of treatment sought, but race/ethnicity should be considered when characterizing these youth. Although racial differences in adolescent body image/esteem have been reported, it is unknown why black adolescents with extreme obesity would report less impact of weight on their physical functioning. Overall, these data suggest that HRQOL is not homogenous in adolescents with extreme obesity.

Holly, S. K. (2008)48 the purpose of the study was to examine the relationship between child weight status and young adult quality of life. One hundred sixty four college students participated in the study. Students completed four questionnaires that were used to assess physical and psychosocial variables. Several statistical analyses, including correlations and hierarchal regression models, were employed to test the study's hypotheses. Results from the study showed that child weight status was negatively associated with adult quality of life, and child self-concept was a mediating variable within the relationship. Recognizing the relationship between child weight status and young adult quality of life stresses the importance of addressing psychosocial concerns related to weight status during childhood in efforts to achieve a greater quality of life in adulthood.

Shaikh, W. A. et al. (2010) the current study was conducted to determine how physical activity level and physical fitness affects the blood pressure profile of Gujarati Indian adolescents so as to help in developing preventive strategies for the local population as ethnic differences exist in the pathogenesis of hypertension. A cross-sectional study was conducted on 485 Gujarati Indian adolescent boys and girls of age group 16-19 years. Physical activity level was assessed using Johnson Space Center/NASA Physical Activity Rating Scale and VO2max was used to assess the physical fitness. Body composition was assessed in terms of Body Mass Index, Fat Mass Index and Waist Circumference. Blood Pressure was measured by oscillometry. One way ANOVA was used to study if any significant differences (P<0.05) existed in the blood pressure profile between the high, moderate and low physical activity groups. Pearson’s correlation coefficient was determined to assess the relationship between VO2max and blood pressure profile. In girls, physical activity level was not found to have a significant effect on the blood pressure profile. In boys, systolic blood pressure and mean arterial pressure were found to be significantly higher in Moderate Physical Activity Group as compared to Low Physical Activity Group. PVO2max was found to have a significant negative co-relationship with SBP, DBP and MAP in girls and a significant negative co-relationship with SBP, PP and MAP in boys. It could thus be concluded that a better physical fitness rather than a higher physical activity level could keep the blood pressure in check in the Gujarati Indian adolescents.

Ossanloo, P. et al. (2012) Exercise training and physical activity modified body fat percents and serum lipid profiles, but the influences of different types of exercises and combination of them on body fat percents and serum lipid profiles has rarely been investigated. The aim of this study was to investigate the effects of 12 weeks combination training included aerobic dance, step exercise and resistance training on body fat percents and serum lipid profiles in sedentary females. Eighty subjects randomly selected from 100 volunteered healthy sedentary females (25-45 years) based on American College of Sports Medicine and Physical Activity Rating Questionnaire in AL-ZAHRA University (Tehran, Iran). This subjects randomly

divided in two groups such as, Exercise (n= 40) and Control groups (n= 40). Subjects in exercise group were training for 12 weeks, 3 sessions in week, and 60 minute in sessions with 60-80 percent of Heart Rates Reserve (HRR). Combination training program include aerobic dance, aerobic step exercise and resistance training was performed based on progressive overload training principal. Total Cholesterol (TC), Triglyceride (TG), Low Density Lipoprotein Cholesterol (LDL_C), High Density Lipoprotein Cholesterol (HDL_C) and Body Fat percents (% BF) has been measured before and after 12 weeks training program. Data compared with two tailed paired and independent sample t test (p≤0.05). The results showed that levels of HDL_C and % BF significantly modified after 12 weeks training (p< 0.05). There were no significant changes in TC, TG and LDL_C. These results indicated that moderate intensity combined training included aerobic dance, step exercises and resistance training have positive effect on some serum lipid profiles and body fat percents in sedentary females.

Abbott, R. et al. (2000)\(^5\) this study examined the relationship between physical activity level and body fatness in a sample of Brisbane school 43 children aged 5 to 10 years. Total energy expenditure (TEE) was calculated using the doubly labeled water technique. Physical activity level (PEE) was determine using the equation PAL=TEE/REE. Fat mass was then calculated as body weight minus fat free mass. There was no significance difference in PAL values between boys and girls. Girls had a higher mean percentage body fat then boy. For all children body fat was significantly inversely correlated with PAL. These findings suggest that physical activity in the early years of life has some influence on body composition.

### 2.3 Reviews related to Dance Aerobics and Aerobic Exercises

Aamnda (1982)\(^5\) investigated the effects of fourteen weeks of aerobic training on the plasma lipids and lipoproteins, body composition and functional capacity of sedentary adult women. Women who smoked or were taking birth control pills were eliminated from the study because of their effects of plasma lipids and lipoproteins. All participants were given a pretest (T1) intermediate test (T2) and a posttest (T3) on the following variables. 1) Blood test measured high density

---


lipoprotein cholesterol (HDL-C) low density lipoprotein cholesterol (LDL-C) triglycerides, total cholesterol and the HDL-C/ total cholesterol ratio. 2) Body composition percent body fat as estimated from the sum of four Skinfolds using the Harpenden Skinfolds caliper. 3) Body weight. 4) Functional capacity- measured by the Bruce Treadmill test. The experimental group (Group I) participated in an aerobic exercise class that met for one hour three days per week for 14 weeks. Subjects exercised at a 75% maximum heart rate as determined by use of the Karvonen formula. The control group (Group II) was asked to maintain normal activity and diet. The result of 14 weeks of aerobic training on sedentary adult women is significantly increased function capacity and significantly decreased percent body fat. HDL-C, LDL-C, triglyceride, total cholesterol and HDL-C, total cholesterol ratio was unchanged in this particular study.

Belle (1983)\(^5\) investigated the effects of aerobic dance on physical work capacity, cardiovascular function and body composition of middle aged women. Maximal oxygen uptake, heart rate during sub maximal treadmill walking, resting heart rate, blood pressure and body composition assessed using hydrostatic weighing and skin fold. Circumference measures were determined before and after a 10 week aerobic dance conditioning program in 28 women (18 experimental and 10 control), aged 25 to 44 years. During the 10 week treatment period, the experiments’ subjects participated in 45 minute of aerobic dance that utilizes 70-85% of the heart rate reserve, 3 days/week whereas the control group continued their normal physical activity pattern VO\(_2\) max increased significantly in the experimental group by 0.142 (1 / min 16%) or 1.8 ml / kg min (5%) whereas the control group decreased significantly by 0.1171 /min (6.0%) and 2.5 ml/ kg min (7.7%). On the modified Balke treadmill test increased significantly by 2.1 minutes in the experimental group and did not change in the control group. Heart rate of sub maximal workloads on the treadmill test decreased 14-18 beats/ min in the control group. Resting heart rate and systolic blood pressure decreased significantly in the experimental group by 5 beats / min and 6 mm Hg, respectively, but did not change in control group. Body weight, % fat weight, fat free weight estimated using hydrostatic weighing: sum of 7 Skinfolds and sum of 7 circumferences did not change significantly in either group. It was concluded that a 10 week dance aerobic programme produces small but significant

improvement in physical work capacity and cardiovascular functions, but without
dietary control, does not alter body composition in sedentary middle aged women.

**Vetro (1991)** study was 27 female employees of an insurance company. They were randomly assigned into 4 groups: Aerobic dance (AD), Nutrition Intervention (NU), Aerobic Dance and Nutrition Intervention (ADN), and control (C). The AD group participated in a 10 week aerobic dance class for 30 min 3 times per week. The NU group participated in a 10 week nutrition program, which met once per week and followed the American Heart Association guidelines. The ADN group participated in both the aerobic dance and nutrition programme. The C group was not involved in any exercise of nutrition programme. All the subjects were pre and post tested for changes in blood lipid variables (total cholesterol, HDL-C, LDL-C, triglycerides), cardiovascular measurement and dietary intake patterns. An ANCOVA was used to analyse the data. No difference (p>0.05) was found among the 4 groups in any of the 18 variables under investigation. Multiple ‘t’ test were performed to analyze changes from pre to post test for any one group. Body weight for the NU group and % body fat for the AD group decreased significantly (p<0.05) from pre to post-test. All other variables did not change significantly.

**Cameron (1989)** conducted a study with a view to determine the effect of 10 week aerobic movement programme for overweight children on cv fitness, body composition, and body esteem. The subjects for the study consisted of 20 children (17 females and 3 males) aged 8 to 12. One group (n=12) consisted of overweight children and one group (n=8) consisted of average weight children. CV endurance was measured in sec with a 2 mile walk / jog in the school halls. Self concept was measured with the Piers-Harris Children’s self concept scale. Body esteem was measured with Mendelson and Whites’s body esteem scale. A 2 x 2 ANOVA was employed to determine the significance of effect. Overweight and average weight children were the independent variables. Self concept, Body esteem, and CV endurance were the dependent variables. Body composition (triceps skin fold measures) was used to distinguish the 2 groups and determined weight loss due to the programme. The ANNOVA indicated no statistically significant improvements in

---

C.V. endurance, self concept, and body esteem in overweight children in comparison with average weight children after a 10 week aerobic movement programme.

**Daley, A. J.; Buchanan, J. (1999)** Aerobic dance and physical self-perceptions in female adolescents: some implications for physical education. A study of 113 females aged 15-16 years from a single-sex secondary school in southeast England, UK, examined self-perception changes associated with participating in extracurricular aerobics. 43 of the girls were recruited to an aerobics plus physical education, the remainder (n=70) to a physical education only group. The results were assessed using the Physical Self-Perception Profile (PSPP), which contains five 6-item subscales: sports competence; body attractiveness; physical condition; physical strength; and physical self-worth. The results reveal significant changes in adolescent girls' physical self-perceptions due to participation in a five-week course of aerobics.

**Munish, S.R. & Sharma, R. (2008)** This research included 30 Male student aged 14+ which made up the Experimental group, and 30 the control group. The effects of a rhythmic activity on selected physiological parameters and physical fitness profiles were studied. The experimental model of the recreational aerobic exercise model was realized six times a week, over a period of six weeks, and the duration of each individual exercise was 60 minutes. The variables used for physiological parameters were pulse rate, vital capacity and Blood pressure. Physical fitness profiles were accessed by using the variables muscular strength, muscular endurance, cardiovascular endurance and flexibility. For rhythmic activity, aerobic dance was considered. The study was considered only for six weeks duration. The basic descriptive statistic parameters were calculated for all of the results, and the difference between the initial and final measuring was determined by ‘t’ test. A statistically significant difference was found to exist between the initial and final measuring in regards to the applied variables for the evaluation of Physical and Physiological variables of the subjects belonging to the experimental group, while there were no statistically significant differences found in the case of the subjects belonging to the control group. Group statistics and Independent t test analysis revels

---


that there is significant effect of rhythmic activity on the Strength endurance, Cardiovascular-endurance, Flexibility and Vital capacity. And there was no significant effect on the parameters viz. Explosive strength, Resting pulse rate, Systolic B.P., Diastolic B.P. This research supports the existing conclusions about the positive effects of rhythmic activity, on the condition that it is realized with the appropriate intensity, length and duration.

Kraemer et.al. (2001) conducted a study on resistance training combined with bench-step aerobics which enhances women's health profile. Thirty-five healthy, active women were randomly assigned to one of four groups that either a) performed 25 min of BSA only (SA25); b) performed a combination of 25 min of BSA and a multiple-set upper and lower body resistance exercise program (SAR); c) performed 40 min of BSA only (SA40); or d) served as a control group (C), only performing activities of daily living. Direct assessments for body composition, aerobic fitness, muscular strength, endurance, power, and cross sectional area were performed 1 wk before and after 12 wk of training. All training groups significantly improved peak VO(2) (3.7 to 5.3 mL O(2).kg(-1).min(-1)), with the greatest improvement observed in the SAR group (P = 0.05). Significant reductions in pre exercise heart rates (8-9 bpm) and body fat percent (5--6%) were observed in all training groups after training. Significant reductions in resting diastolic blood pressure were observed for the SAR and SA40 groups (6.7 and 5.8 mm Hg, respectively). Muscular strength and endurance only improved significantly in the SAR group (21 and 11% respectively). All groups demonstrated increased lower body power (11--14%), but only the SAR group significantly improved upper body power (32%). Thigh muscle cross-sectional areas measured via magnetic resonance imaging (MRI) increased primarily for the SAR group. BSA is an exercise modality effective for improving physical fitness and body composition in healthy women. The addition of resistance exercise appears to enhance the total fitness profile by improving muscular performances, muscle morphology, and cardiovascular fitness greater than from performing BSA alone. Therefore, the inclusion of both modalities to an exercise program is most effective for improving total body fitness and a woman's health profile. On the basis of the recommendations of various authors, the exercise program should consist of interval or continual exercise with an intensity of 50% for beginners up to as much as 80% of

maximal oxygen uptake or heart rate frequency for the more advanced. The exercise should occur with a frequency of at least three times a week for a period of 30 to 40 minutes. This kind of exercise brings about maximal oxygen uptake, heart volume, maximal minute heart volume, or in a word, the general improvement of the body.

**Opinion of the researcher**

Above literature shows that there was a significant change in health related fitness, psychological and physiological variables due to varied fitness programme interventions. From the review of related literature, it was found that there was a scope for research in analyzing the body image, self concept, body mass index, cardiovascular endurance, waist hip ratio and intervention of aerobic dance programme among adolescent school girls.

Based on the experience gained, the investigator formulated suitable methodology to be adopted in this research, which is presented in chapter-III.