CHAPTER 1

INTRODUCTION

Adolescence is the time between childhood and adulthood. Individuals are likely to undergo extreme emotional, physical, and mental changes while progressing through this stage. During this time period, many adolescents struggle with forming a self-identity and establishing a solid understanding of themselves and the world around them. Understanding how physical activity can positively impact adolescents during this time of great change can be extremely beneficial. Helping these individuals make strong choices during adolescence can positively impact their lifelong development and facilitate a successful transition into the next stage of development.

Adolescents in India, account for one-fifth of the total population and are a significant human resource that needs to be given ample opportunity for holistic development towards achieving their full potential. Not only are needs of the adolescents related to their physical development, but also to their emotional and psycho-social development. Past research experience has shown that conducive environment facilitates holistic development of adolescents into mature and productive human resource and several negative influences, affecting the socio-cultural growth of adolescents, are preventable. Adolescent girls have their own developmental needs, which are peculiar to them and need to be addressed separately.

Many adolescent girls believe physical appearance is a major part of their self-esteem and their body is a major sense of self. The experience of body dissatisfaction can lead to poor health habits and low self-esteem. Many women want to be slim, since slim is regarded as beautiful, while being overweight is viewed negatively.\(^1\)

Since feelings about one may be shaped by the attitudes of others, those who are overweight may suffer from low self-esteem and have high levels of depression. Sheslow et al noted that obesity in adolescence may cause psychosocial problems, such as lowered self-esteem, depression, and difficulties with interpersonal relationships.\(^2\) A distorted perception of one's body is also a determinant of

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disturbance in self-esteem. A more negative body image is related to lower self-esteem.³

The present study was to determine the extent of body weight and body shape dissatisfaction in a group of female adolescent school students; and to examine whether body mass index (BMI) and perception of a weight problem predict level of self-concept and body image.

1.1 Body Image

Body image refers to the picture that a person forms of their body in their mind. This may have no bearing at all on actual appearance. Physical appearance differs in meaning and importance for males and females; concerns surrounding body weight and shape also differ.⁴

Body image is closely connected to a person's self-esteem.⁵ While men tend to obtain their self-esteem through achievements, power status and control, women's self-concept and self-esteem is often based on desirability and attractiveness. Thus, women are under greater pressure than men to lose weight.⁶

Adolescence can be an extremely confusing time for most teenagers. During this stage, adolescent girls are in a growth period, which alters not only their body’s appearance, but also their views, beliefs, identity and attitudes about self and body image. An important aspect in finding self-identity is the concept of how you perceive your body.

A person's body image is influenced by their own beliefs and attitudes as well as ideas in society. For females, as compared with males, there is a greater discrepancy between their perceived body size and their ideal body size. Female adolescents are more preoccupied with physique and appearance than are those in other age groups,⁷ and they are more likely to identify themselves as overweight than

are males.\textsuperscript{8} There is research to suggest that female adolescents tend to be dissatisfied with their body weight, size, and shape.\textsuperscript{9} In a study by Kim and Yoon 72.5% of normal weight Korean female adolescents perceived themselves as overweight or obese; and 76% of these subjects tried to lose weight.\textsuperscript{10}

Adolescence marks a time of rapid and intense emotional and physical changes. There is an increased value placed on peer acceptance and approval, and a heightened attention to external influences and social messages about cultural norms. Body image and related self-concept emerge as significant factors associated with health and well-being during this developmental phase, as youths begin to focus more on their physical appearance. How adolescents formulate and define their body image ideals and subsequent self-comparisons is strongly influenced by personal, familial, and cultural factors.

Social influences, however, which include the media and popular/mainstream culture, may promote specific images and standards of beauty and attractiveness that contradict good health practices and one's ability to achieve a specific body type or image.

Availability of food for all the population has generally been a matter of serious concern in our country. Not only the food production and distribution mechanisms are under stress, but also the intra-family food distribution is influenced by gender bias in the face of limited food availability at home. The food security in rural and urban households manifests in human growth and development as reduced parameters of height and weight, besides lower body mass.

Although these messages permeate the whole of society, including adolescent boys and girls, girls are often targeted by media and social body image ideals and are more likely to suffer negative health outcomes associated with body dissatisfaction.

Many adolescent girls believe physical appearance is a major part of their self-esteem and their body is a major sense of self. The experience of body dissatisfaction can lead to poor health habits and low self-esteem. These negative feelings may contribute to a higher prevalence of depressive symptomatology and lower self-


esteem among girls and can affect health behaviors associated with poor eating habits, dieting, depression and anxiety, and eating disorders.\textsuperscript{11}

Early adolescence presents extensive developmental challenges for girls. During early adolescence girls also become more focused on their appearance, weight, and shape as key aspects of their identities. In other words, at a time when a girl’s physical appearance is most important to her, her body is changing in ways that are increasingly discrepant from the thin ideal. These influences leave many girls vulnerable to body image dissatisfaction (BID). According to Levine and Smolak (2002)\textsuperscript{12} between 40\% and 70\% of adolescent girls are dissatisfied with two or more aspects of their bodies, most generally with the hips, buttocks, stomach, and thighs. One study found that over 80\% of girls surveyed reported body dissatisfaction, while another large-scale study revealed that 42\% to 45\% of 9th-to-12th-grade girls were dieting to lose weight. With such large numbers of girls experiencing dissatisfaction with their bodies, it is important for school counselors to note that BID is associated with emotional distress, obsessive thinking about appearance, unnecessary elective cosmetic surgery, depression, poor self-esteem, and maladaptive eating practices.

In this study, it was expected that in case of adolescent girls Dance Aerobic training will influence their Body image.

1.2 Self Concept

Adolescence is the developmental period of transition between childhood and adulthood; it involves biological, cognitive and socio-emotional changes. These changes transform the young person’s vision of the self into more complex, well-organized and consistent picture. Self-conception of adolescents changes in structure as well as content. Structurally it becomes more differentiated and organized. Adolescents are more likely to employ complex, abstract and psychological self-characterization. Self-esteem, the evaluative side of self-concept is also modified during these years. Adolescent’s well organized self-description and expanded sense of self-esteem provide the cognitive foundation for constructing an identity.


The self has been defined as that part of one’s personality of which one is aware. Self-concept is “the set of perceptions or reference points that the subject has about himself; the set of characteristics, attributes, qualities and deficiencies, capacities and limits, values and relationships that the subject knows to be descriptive of himself and which he perceives as data concerning his identity.”\textsuperscript{13} Shavelson, Hubner and Stanton (1976)\textsuperscript{14} define the term self-concept as the “perception that each one has about himself, formed from experiences and relationships with the environment, where significant people play an important role.

Self-concept is not innate, but is developed or constructed by the individual through interaction with the environment and reflecting on that interaction. This dynamic aspect of self-concept is important because it indicates that it can be modified or changed. (Franken)\textsuperscript{15}. The way an individual views himself accounts to a large extent for his success. It was found that aspirations and the drive to succeed are good predictors of achievements (Hamaechek)\textsuperscript{16}. Self concept is not a substance but a process in which a conversation between the “I” and “ME” takes place. The “ME” is the more or less integrated set of attitudes and ideas of other people which we have built together as our conscious experience and from which we also choose roles to represent our own ideas of ourselves (Devi, U. et al.)\textsuperscript{17}.

The development of adequate personality has been found to be closely related to the development of adequate self concept. A child who has an adequate self concept is likely to follow the problem solving approach and tends to be spontaneous, creative and original. He trusts himself and is free to accept others without any negative feelings. As against this, a child with distorted or inadequate self concept does not come to grips with the problems of life. He/she tends to view himself as unwanted, unaccepted, incompetent, more anxious and less adjusted, less effective in groups and develops inferiority complex. He/she also likely to exhibit a large extent of anxiety in her/his behavior. Due to poor self concepts such children have lack of confidence in the mastery of environments and leads to failures. Thus, an individual

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must choose a discipline and career which permits him / her to function in a role consistent with his /her self concept which will help them to achieve their desired goal (Sood.)\textsuperscript{18}. The child’s views about himself are shaped by how his parents view him. This fact is well explained by an old saying, “Children win the name if the parents wish the same”.

According to Harter\textsuperscript{19} general or global self-concept is determined by the degree of importance that we assign to each of its specific components. If, when describing ourselves, our value judgments are satisfactory, then we obtain a positive global self-concept; in the opposite case we generate negative feelings and thus produce a negative global self-concept. In adolescence, school/college experience plays an important role in the development of self-perception and can have powerful and long lasting effect on the self-esteem of the adolescents.

Evidence suggests that men derive self-esteem more from individuating themselves from others i.e. feeling unique in comparison with others, where as women derive self-esteem in terms of their connection to others. Cross & Madson (1997)\textsuperscript{20} argue that many of the sex differences we observe in behaviour are due to different ways men and women define themselves. Men maintain an independent sense of self that is separate from others; women by contrast, maintain an interdependent sense of self in which others are integrated into the self. Men are more likely to describe themselves in terms of their independence from others (emphasizing personal attributes and skills) and women are more likely to describe themselves in terms of their connections to others (emphasizing roles, relationship to others).

Men and women have different beliefs about their strong points and derive their self-esteem from different sources. Women in our society are judged on the basis of their physical beauty and attractiveness. Intelligence, academic excellence is considered less appropriate criteria for assessing women. In major review of research studies, the consensus is that physical attractiveness is of great importance for women

than for men. Young adolescent girls are very much aware of the prevailing cultural standard of attractiveness. When they meet these standards, their self-esteem is enhanced. If they are not able to meet the standards, their self-esteem is harmed. They face formidable challenges in meeting the punishing cultural standards of attractiveness. During early adolescence, sometimes there is a decline in the self-esteem of girls for negative body image.

Negative self-perception and low self-esteem are widely established markers of negative health and health-damaging behaviour, whereas positive self-perceptions and high self-esteem seem to accompany a wide array of positive factors linked to health, achievement and behaviour. The impact of physical activity and exercise on general physical health, as well as on important aspects of mental well-being, (depression, anxiety and mood) is also today well-documented. Given the robust association of self perception/ self-image and exercise with mental as well as physical health, a fundamental question is: What role does regular exercise play in the shaping of, and evaluation of, individuals’ self-perception? is the question of this dissertation.

During adolescent years, children need special care as they undergo a complex process of emotional, physical and social changes. At times, failure to adjust with these changes leads to mental health problems. Both girls and boys are susceptible and suffer from these problems. However, in case of adolescent girls, the problem gets compounded due to societal factors. Unfortunately, these needs of adolescent girls have not been addressed by the health system. Adolescents are the future citizens of a country and it is imperative to systematically address their needs.

In this study, it was expected that in case of girls Dance Aerobic will influence their overall self-concept.

1.3 Body composition

Body composition is one of the components of physical fitness and it refers to the tissue components which make up the body and is usually used to mark the relative percentage of fat and lean body tissue. In environments of health and fitness, the main interest is the acquisition of knowledge regarding the relative amount of body mass in relation to fat-free mass and the distribution of fat in the human body, with the additional interest in the changes in these components.

Body composition (BC) refers to the tissue components which make up the body and are usually used to refer to the relative percentage of fat and fat-free tissue. Fat-free mass (FFM), fat body mass or fat mass (FM) and the percent of body fat (%BF) are the most frequent components in the evaluation of body composition. The percent of body fat represents the percent of the total body mass which consists of fat. Fat-free mass refers to the mass of fat-free tissue and is known as lean body mass (Howley et al.)²².

Body weight consists of many components, the relative proportions of which vary among individuals. Total body weight, which includes bone, muscle, fat, blood, and so on, is conveniently divided into the lean body mass and fat mass. Lean body mass is the weight of all body tissue except fat. Fat mass is the portion of the total body weight that is composed of fat tissue. Body fat is stored in various organs of the body, such as the heart, liver, lungs, and brain. In addition, body fat is retained in adipose tissue, including the fat surrounding various internal organs as well as the subcutaneous layer of fat just beneath the skin. Some body fat is essential as an energy store, for protection of internal organs, as a component of nerves and cell membranes, and as insulation against heat loss. Essential body fat is 3% to 5% for adult males and 11% to 14% for adult females of their total body weight, respectively.

Adolescence is a period of transition between childhood and adulthood. It occupies a crucial position in the life of human beings, characterized by an exceptionally rapid rate of growth. Obesity in childhood is associated with an increased incidence of hypertension, diabetes, coronary artery disease, osteoarthritis and overall increase in morbidity and mortality during adult life. Children and adolescents of affluent families are presently overweight than in the past, possibly because of decreased physical activity, sedentary lifestyle, altered eating patterns and increased fat content of the diet.²³

Obesity has become a major health, social and economical burden of today’s world. It has now been well established that obesity directly increases cardio metabolic risk by altering the secretion of adipokines and, indirectly by promoting insulin resistance and its associated metabolic disorders. Moreover, obesity causes additional health problems as it is closely associated with the development and

progression of coronary heart disease, certain forms of cancer, respiratory complications (e.g. obstructive sleep apnoea) and osteoarthritis.  

There has been an increase in the percentage of overweight and obese children in affluent urban families of India in the past decade. Evaluation of obesity in children is important as it provides an opportunity to identify the problem into adulthood. Body mass index (BMI) in childhood changes substantially with age. Hence, cut off points related to age would better define child obesity. There has been a trend towards increasing prevalence of overweight and obesity among developing countries.

**Assessing body composition**

An evaluation of body composition is essential prior to making specific recommendations about a person’s need to lose or gain body weight. Among the several methods of assessing body composition are hydrostatic weighing, measurement of bioelectrical impedance, and measurement of skin fold thickness.

**Hydrostatic weighing**

Hydrostatic (underwater) weighing involves placing a subject in a specially designed underwater tank to determine body density. Fat tissue is less dense than lean tissue. Therefore the more body fat present, the more the body floats (buoyancy) and the less it weighs in water. Body composition is calculated by comparing the weight of the submerged individual with the weight before entering the tank. If done properly, this technique is very accurate. Unfortunately, the tank and equipment are expensive and generally not available to most people. In addition, there are other drawbacks with this technique. It is time consuming (especially for large groups), and subjects must exhale completely and hold their breath underwater. Many students have real problems and fears with this.

**Bioelectrical impedance**

The technique involves the measurement of resistance to the flow of electrical current through the body between selected points. This technique is based on the principle that electricity will choose to flow through the tissue that offers the least resistance or impedance. Fat is generally a poor conductor. Thus the higher the percentage of body fat, the greater the resistance to the passage of electrical energy. Very simply, this method predicts the percentage body fat by measuring bioelectrical impedance. It should be mentioned that bioelectrical impedance measures can be

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affected by levels of hydration. If the body is dehydrated, the measurement will tend to overestimate percentage of body fat relative to measurements taken when there is normal hydration. The equipment available for taking these measurements is, again, fairly expensive and generally includes the use of computer software.

**Body mass Index (BMI)**

Once you have calculated the percentage of your total body weight that is made up of fat tissue, you may determine that you have too much fat. A relatively easy way to determine the extent of overweight or obesity is to use a person’s body weight and height measurements to determine body mass index (BMI). BMI is a ratio of body weight to height. This technique represents a method for measuring health risks from obesity using height/weight measurements. Health problems associated with excess body fat tend to be associated with a BMI of more than 25. A BMI of 25-30 indicates that a person is overweight. A BMI of 30 or more indicates a state of obesity.

**Formula for calculating BMI:**

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\text{BMI} = \frac{\text{Weight in Kg}}{\text{Height in meter square}}
\]

BMI provided a simple numeric measure of a person's "fatness" or "thinness", allowing health professionals to discuss over- and under-weight problems more objectively with their patients. However, BMI has become controversial because many people, including physicians, have come to rely on its apparent numerical authority for medical diagnosis, but that was never the BMI's purpose; it is meant to be used as a simple means of classifying sedentary (physically inactive) individuals with an average body composition. For these individuals, the current value settings are as follows: a BMI of 18.5 to 25 may indicate optimal weight; a BMI lower than 18.5 suggests the person is underweight while a number above 25 may indicate the person is overweight; a BMI below 17.5 may indicate the person has anorexia nervosa or a related disorder; a number above 30 suggests the person is obese (over 40, morbidly obese).

**Skinfold Method**

Body fat calipers measure skin folds to calculate how much subcutaneous fat (fat under the skin) a person has. The examiner then puts the numbers into and equation to predict body density and body fat percentage.
It is possible to get accurate body fat measurement with calipers if the tester knows the proper technique for the various sites.\(^{25}\)

Skin folds are practical index of body composition or relative fatness/leanness, which provide a more accurate estimate of body fatness than simple weight, height and various ratios of these two measurements.\(^{26}\)

The technique of assessing body composition by measuring the thickness of the skin folds has the widest use, compared to the other techniques. It is based on the idea that about 50% of the fat in the body is subcutaneous (under the skin). By measuring the thickness of this layer of fat, the total percentage of body fat can be calculated. Skin folds are measured at various body sites using skin fold calipers. Men and women tend to develop fat deposits in different body areas; skin fold measurements must be taken at these specified places. A number of different methods for calculating body fat percentage using skin fold measurements have been developed. The most frequently measured skin fold sites are the triceps, subscapular, suprailiac, thigh, abdomen, calf, and chest.

**Girth Measurements**

Girth measurements offer an easily administered, valid and attractive alternative to Skinfolds. Girth measurements should be taken at the following sites using the Gulick tape. The sites commonly used for girth measurements are: upper arm (biceps), forearm, abdomen, hips (buttocks), thigh, and calf. The equations we will use to estimate % body fat using girth measurements are designed for young and old men and women, provided the individual’s physical characteristics resemble the original validation group. The equations should not be used for individuals who appear excessively fat or thin, or who participate regularly in strenuous sports or resistance training that often increases girth without changing subcutaneous body fat. Along with predicting % body fat, girth measurements can also be used to analyze patterns of body fat distribution.

**Waist to Hip Ratio**

It has been well established that the location of the body fat can influence the health risks associated with obesity. Studies have shown that upper body fat poses a greater health risk than lower body fatness. For this reason, it is important to keep


both your total and abdominal fat levels low, especially as you grow older. A useful indicator of fat distribution is the waist to hip circumference ratio. A high ratio between the waist hip has been shown to be correlated with high incidence of heart attack, stroke, chest pain, breast cancer, and death. Research evidence indicates that people who exercise regularly accumulates less fat in the upper central regions of the body as they get older. This suggests that regular physical activity throughout life will result in a smaller waist to hip ratio and reduced risk of various lifestyle diseases.

Circumference of waist-to-hip ratio (WHR) will be measured as follows:

a. Waist: Narrowest part of the torso (above the umbilicus and below xiphoid process)

b. Hip: At the maximal girth of the hips or buttocks region above the gluteal fold

In the present research body composition was assessed by the body mass index, waist to hip ratio, and skinfold.

1.4 Cardiovascular Endurance

Cardiovascular endurance is the ability of the body’s circulatory and respiratory systems to supply fuel during sustained physical activity.

The functional capacity of the cardio respiratory system, heart, lungs and blood vessels are described through aerobic capacity of an individual. It is a function both of cardiovascular performance and the maximum ability to remove and utilize oxygen from circulating blood. To measure cardio respiratory capacity a subject will undergo progressively more strenuous exercise from an easy walk through to exhaustion. The higher the measured cardiovascular endurance level, the more oxygen has been transported to and used by exercising muscles, and the higher the level of intensity at which the individual can exercise. More simply stated, the higher the aerobic capacity, the higher the level of aerobic fitness. The Cooper test can be used to assess functional cardiovascular endurance.

Cardiovascular risk profiling attempts to establish the absence or presence of a number of risk factors that together with overweight and obesity contribute to the progression of cardiovascular disease, such as endothelial dysfunction, hypertension,
inactivity and poor exercise capacity. Both overweight and obesity appear to be associated with low aerobic capacity.\textsuperscript{27}

It has been known that endurance exercise training decreases cardiovascular risk, but an optimal training programme has not yet been identified. Similarly, criteria for the minimum protective exercise programme against overweight and obesity have not been established. Although the recommended exercise intensity spans the range 40–90\% of VO2max (maximal oxygen uptake), most studies indicate that high intensity exercise, i.e. toward the upper end of the range, results in larger aerobic and cardiovascular adaptations and many rehabilitation programme advocate the use of low-to-moderate-intensity exercise.\textsuperscript{28}

Exercise remains a key aspect of a healthy lifestyle. However, strenuous physical exercise results in an enhanced uptake of oxygen leading to increased metabolism, which can increase the production of reactive oxygen species (ROS).\textsuperscript{29} Cells continuously produce free radicals and ROS as part of metabolic processes. These free radicals are neutralized by an elaborate antioxidant defense system consisting of enzymes such as catalase, glutathione peroxides, and numerous non-enzymatic antioxidants, including vitamins A, E and C, glutathione. Exercise can cause an imbalance between ROS and antioxidants, which is referred to as oxidative stress.\textsuperscript{30}

Due to the high degree of automatization, modern man is experiencing a high degree of inactivity which is becoming an increasingly significant factor in the appearance of a great number of illnesses. In these current living conditions where technological development has directed man’s activities from physical to intellectual labor, modern man is increasingly susceptible to a sedentary lifestyle. This brings about a decrease in physical activity, and thus leads to the endangerment of the health


and normal functioning of organs and systems of organs. The threat to the health of sedentary individuals is conditioned by a decrease in the functioning of the locomotors, cardio-vascular, and respiratory system, as well as other organs and systems of organs. Physical inactivity and a sedentary lifestyle have a very negative effect on almost all of the systems of the human body, and especially on cardiovascular functions. The decrease in the functional abilities of the human body in the modern world, the development of obesity can be solved by regular physical activity.

Fitness centers offer a variety of aerobic exercises to music as part of their exercise programs, in the form of various organized physical activities. What is characteristic about this kind of exercise is that all of the participants in the aerobic exercise program exercise to the same rhythm and to the same tempo, and thus activate muscles of various parts of the body. Taking part in recreational activities, or to be more precise in systematic physical exercise, enhances the harmonious functioning of all organs and systems of organs, and influences the preservation of functional abilities of the cardio-vascular, respiratory, endocrine, locomotors and nervous systems.

On the basis of the research carried out by various authors, the positive influence of aerobic physical activities on functional abilities, body composition, and the muscle strength of man in the sense of a qualitative improvement. Thompson have studied the changes to VO2max, heart rate frequency, systolic arterial blood pressure, diastolic arterial blood pressure and the accumulation of lactates in the blood under the influence of two different aerobic dance programs.

When the intensity of the load is optimum, the structural or functional adaptation of the organs of the person who is exercising, which are under strain, can lead to an improved tolerance to load. Many of the reactions to load, as well as the body's adaptation to them, are both caused by activities which are appropriate for the abilities of the subject, who experiences an improvement in his general health and the functional capacity of his body.

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The American College of Sports Medicine (ACSM), recommends that all those who would like to maintain and improve their cardio-respiratory abilities should exercise three to five times a week with the use of rhythmic, aerobic activities which activate large muscle groups in the human body (walking, running, bike riding, using a stationary bike, aerobic dance, etc.). The intensity of the exercise should be from 55/65% to 90% of the maximal heart rate frequency, and the duration of the exercise should be from 20 to 60 minutes. If the intensity of the exercise is smaller than the recommended maximum heart rate frequency values, the duration of the exercise should be increased. In addition to aerobic exercise, one should also include exercises for the development of stamina, mobility and strength, at least twice a week, which would maintain a body mass without fat, improve muscle strength and stamina and preserve their functions. All this is made possible through an extended participation in regular physical activity and a lifestyle of higher quality.

1.5 Aerobic exercise

Aerobics refers to a “variety of exercises that stimulate heart and lungs activity for a time period sufficiently long to produce beneficial changes in the body”.

Meaning of Aerobics

“Aerobic” basically means living or working with oxygen. Aerobics or endurance exercises are those in which large muscle groups are used in rhythmic repetitive fashion for prolonged periods of time. Aerobics refers to a variety of exercises that stimulates heart and lungs activity for a time period sufficiently long to produce beneficial changes in the body. Running, swimming, cycling and jogging are typical aerobic exercises.

Aerobic exercise means the exercise where all body parts/muscles are supplied with enough oxygen with the increased heart rate. Aerobic exercises include brisk walking, jogging, swimming, cross-country, skiing, hopping, and skipping. By doing aerobics, the whole body is used and major muscle groups including legs, trunk and arms get involved. In aerobic exercise the heart rate increases substantially, but never reaches its maximum level. The heart is always able to deliver sufficient oxygen-rich blood to muscles so that they can derive energy from fat and glycogen aerobically. Aerobic exercises builds stamina for sports and it also is the most important form of exercise for health, since it increases the efficiency of heart, circulation and muscles. Aerobic exercise is the keystone of fitness by doing aerobics it increases the capillary network in the body.
The American college of sports medicine defines aerobic exercise as “any activity that uses large muscle groups, can be maintained continuously, and is rhythmic in nature.” It is a type of exercise that overloads the heart and lungs and causes them to work harder than at rest. The important idea behind aerobic exercise today, is to get up and get moving!! There are more activities than ever to choose from, whether it is a new activity or an old one. Find something enjoy doing that keeps your heart rate high for a continuous time period and get moving to a healthier life.

Examples of aerobic exercise are:

1. Aerobic dance  
2. Walking for fitness  
3. Rope skipping  
4. Running  
5. Stair climbing  
6. Swimming  
7. Bicycling  
8. Cross country

Physiologically, aerobics are those exercises, which are performed in utilizing more oxygen. Here oxygen is burned into ATP (Adenosine Tri Phosphate) and PC (Creatine Phosphate) in liberating energy for muscular work.

In aerobics, in the presence of oxygen, 1 mole of glycogen is completely broken down to carbon dioxide (CO2) and water (H2O), releasing sufficient energy to resynthesize 39 moles of ATP. This is by the largest yield of ATP energy. The reactions of the aerobic system can be divided into three main series: (1) aerobic glycosis, (2) the Krebs cycle, and (3) the electron transport system. Aerobics allows the oxygen to be transported one’s legs and one’s upper body, because both areas are being worked at the same time and need a supply. This is referred to as the Oxygen Transport System.

Aerobics helps –

- To breathe in adequate oxygen from the air and the cells use this oxygen to produce energy.
- The lungs to accelerate the passing of oxygen into the blood.
- The heart to increase the pump of blood to all parts of the body.
- Blood vessels need to be clear so blood can be transported to muscle tissues.
- To accelerate the internal respiration occurring into the cell.
- To increase venous returns.
- To expel the waste products e.g. carbon dioxide, toxins etc.
Aerobics and calisthenics are performed to the rhythmic pulse of disco music and strength together in what amounts to a modern dance form, so as to make the exercise more enjoyable and encouraging without extra effort. By doing exercise, the whole system of our body carries oxygen-rich air enters the organs and tissues of the muscles has been called “the aerobic system” and for this reason training the system for stamina is called aerobic training.

The advantages of aerobics exercise are stronger and more efficiently operating heart and lungs, more energy, physical flexibility, conditioned muscles, proper use of fats, and effective burning of calories. The increased oxygen flow gained through aerobics reenergizes one giving more energy and a “re-awakening” of one’s senses. Aerobic exercise produces and increases capacity for pumping larger volumes of blood to accommodate the need of extra energy and extra oxygen. Thus the role of dance aerobic exercises on body functions for school girls is really significant.

Aerobics is a good way to decrease our percentage of body fat and to attain the other metabolic benefits of fitness. Aerobics is also a very good way to develop musculo skeletal fitness while building strength, flexibility, coordination. Aerobics is a progressive physical conditioning programme that stimulates cardio respiratory activity for a time period sufficiently long to produce beneficial changes in the body. To do any work we need energy and even while at rest some physiological functions have to be carried within our body and for that purpose some calories of energy will be burnt. As the intensity and duration of work increases the demand for the fuel in the working muscles also increases. The organs which supply the needful should cope with the demand.

From the introduction of aerobic dance in the early 70's, it has generally been regarded that the music accompaniment to exercise provides an important beneficial effect to the exercise experience. Many health and fitness instructors regard the addition of music to exercise similarly to an ergogenic aid, with the removal of music or an inappropriate selection of music as a sure bet to an unsuccessful class. Some Sports Scientist like Hopkins, David R. (1990) examined the effect of low-impact aerobic dance on 53 sedentary older women. After 12 weeks of dance, subjects improved significantly on all functional fitness components except motor

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control/coordination, including cardio respiratory endurance, strength/endurance, body agility, flexibility, body fat, and balance. In another study Todd, C Davies made a comparative study to find out the physiological responses and rating of perceived exertion in two modes of aerobic exercise in men and women over 50 years of age and found that % peak VO2, % HR max, and RPE were significantly higher for aerobic dance than for walking.

Many reports indicates that majority of school students of developed countries are obese. In fact, female students are more prone towards obesity and in the long run they become the victim of relative risk for orthopedic injury. This may require that the intensity of exercise be maintained at or below the 65% of maximal heart rate recommended for improvement of cardio respiratory endurance (Brand et al 1979). Any imbalance in monitoring heart rate in aerobic exercises may lead to orthopedic injuries. Therefore girl students are generally suggested for non-weight bearing activities, where low intensity aerobics are found useful. Aerobic exercises generate one’s body heat that enhances sweat rate, which throws toxins from the body, and our cardio respiratory system gets training for efficient functioning.

Improved cardio respiratory endurance is often one of the most important benefits of aerobic training programs. An aerobic exercise work out is divided into four phases: warm up, skill review, aerobic and cool down. Each phase has its own purposes, without which the work out is incomplete. Each phase of the program is necessary is aerobic dance is to provide the desires benefits.

1.6 Statement of the Problem

The benefits of aerobic dance toward the contribution to overall wellness have been studied in a skewed manner. Numerous studies in the past have examined the cardio respiratory benefits of aerobic dance. Fewer studies have reported about the effects on Physical Fitness. In this present piece of research the effects of Dance Aerobics on selected physiological and psychological parameters in adolescents was studied.

The literature as presented above indicates that many adolescent women have a poor state of self concept and body image, cardiovascular fitness and body composition which might have been forcing them to involve into wrong attempts to


control their body weight, body shape, with a view to look beautiful. Such tendency may mislead them to become victim of various health hazards.

Thus, proper body image and self concept of adolescent girls are highly essential for their daily walks of life. Although, aerobics helps for improving body awareness, but no study indicates its influence on one’s body image and self concept especially for adolescent girl. It was therefore thought desirable to undertake this study “Impact of Aerobic Dance intervention on selected psychological & physiological parameters in Adolescent Girls”.

1.7 Objectives of the study

Researcher has the following objectives of this study.
1. To measure Body image, Self Concept, Cardiovascular endurance, and Body Composition of adolescent girls.
2. To prepare a dance aerobic training intervention.
3. To determine the effect of dance aerobic intervention on body image, self concept, cardiovascular endurance, and body composition of adolescent girls.

1.8 Assumptions

Researcher assumes as follows
1. It was assumed that adolescent girls were capable for participating in aerobic dance intervention.
2. It was assumed that the girls need better strength, cardiovascular endurance and fitness level, which may help for enriching body image, self concept, cardiovascular fitness, and body composition.
3. The girls will take part actively and enthusiastically in the whole program.
4. It was assumed that the effect of aerobic dance may be of immense use for improving body image, self concept, cardiovascular Endurance, and body composition of adolescent girls.
5. Though scientific method of research is used, it was assumed that the effect on dependent variable after experiment will be because of independent variable.
6. Since the school was residential, the daily routine of the girls was controlled.

1.9 Hypothesis

Researcher predicts the following Non-Directional Research Hypothesis

\[ H_{1,1}: \] There would be significant change in psychological parameter body image of girls due to aerobic dance intervention. \[ H_{1,1}: M_1 \neq M_2 \]
**H$_{1.2}$:** There would be significant change in psychological parameter self concept of girls due to aerobic dance intervention. $H_{1.2}$: $M_1 \neq M_2$

**H$_{1.3}$:** There would be significant change in physiological parameter cardiovascular endurance of girls due to aerobic dance intervention. $H_{1.3}$: $M_1 \neq M_2$

**H$_{1.4}$:** There would be significant change in physiological parameter body Composition (B.M.I., W.H.R. & Skin folds) of girls due to aerobic dance intervention. $H_{1.4}$: $M_1 \neq M_2$

### 1.10 Delimitations of the study

The researcher has come across much delimitation as follows

1. The study was delimited to 13-15 years girls of the Pravara English Medium School, Loni.
2. The intervention was delimited to selected aerobic dance exercises.
3. The experimental period was delimited to 12 weeks.
4. Psychological parameter was delimited to Body image & Self Concept.
5. The measurement of the body image was done with the help of Body Image Questionnaire (BIQ) of Thomas F. Cash.
6. The measurement of self concept was restricted to Self Concept Questionnaire of R.K. Saraswat.
7. Physiological parameter was delimited to cardiovascular endurance & Body composition.
8. The measurement of cardiovascular endurance was restricted to Coopers 12 minute Run Walk test.
9. The measurement of body composition was restricted to B.M.I., W.H.R. & Skin folds.
10. The subjects were told not to take part in the other sports activities during intervention period.
11. The Physiotherapy college girl students were utilized to determine height, weight, waist hip circumference and skin folds.

### 1.11 Limitations of the study

The researcher has come across many limitations as follows

1. The follow up study of the experiment could not be extended further due to the paucity of the time.
2. The subjects of the experimental and control groups were totally ignorant and have no background of aerobic dance.
3. The investigator could not conduct the experiment on the large sample due to insufficient manpower and limited time.
4. The investigator could not control the nutritional diet and the calorie intake of the subjects during the intervention.
5. The food habits, emotional states, hereditary aspects life styles of the subjects were not ascertained and this may influence the study.
6. The competence of the trainer may affect the performance it was controlled by using the same trainer throughout the intervention.

1.12 Operational Definitions of the terms used

1. **Aerobic dance**
   Low impact exercises, involves less jumping actions, but more of footwork, which are coordinated with the rhythm of the music being played.

2. **Body image**
   Body Image involves the perception, imagination, emotions and physical sensation of and about the bodies.

3. **Self concept**
   The self concept is the accumulation of knowledge about the self, such as beliefs regarding personality traits, physical characteristics, abilities, values, goals, and roles.

4. **Cardiovascular Endurance**
   Cardiovascular endurance is the ability of the heart, lungs and blood vessels to deliver oxygen to working muscles and tissues, as well as the ability of those muscles and tissues to utilize that oxygen.

5. **Body composition**
   Body composition refers to the proportion of fat and fat-free mass in the body.

6. **Adolescents**
   Adolescence is the period of physical, cognitive, and psycho-social-sexual transition between childhood and adulthood that occurs from 11-20 years of age.