Chapter I

INTRODUCTION

Praise the LORD, all nations! Praise him, all peoples! His love for us is strong and his faithfulness is eternal.
Praise the LORD!

PSALMS 117: 1 & 2

FITNESS

Fitness is a key to enjoy life. Exercise is an important tool of a total fitness programme. Modern living has taken all the exercise out of our lives and so in order to get fit and have to put it back again, regular exercise is necessary to develop and maintain an optional level of health, performance, and appearance. It makes feel good, both physically and mentally. It gives psychological lift and strengthens a sense of accomplishment. Looking young is a reflection of good health. Regular physical exercise enhance the function of the joints; increase the sense of physical well-being and promotes a sense of feeling good; increases physical working capacity by increasing cardio respiratory fitness, muscle strength, and endurance and decreases the risk of serious diseases that could lead to early disability and death. (Michaud and F. Narring, 1996)

Fitness in the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel and do our best. More specifically, it is “the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure time
activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well being” (Singh, 1991)

Fitness involves the performance of the heart and lungs, and the muscles of the body. And since what we do with our bodies also effects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and emotional stability. (The World Book Encyclopedia, 1993)

Free exercise is the all time favorite means of developing physical condition. Exercise serves nicely as a warm up routine for other activities to follow and it generally provides an outlet for the need for something vigorous especially when a particular lesson requires the pupils to observe and listen more than usual (Willgose, 1974).

Drills are fundamental means of improving a team’s shortcomings. When a coach witnesses an incorrect execution, verbal correction is rarely enough to ensure that his team will not repeat its mistakes-consequently, he must analyze the error situation, break it down into understandable parts and develop a drill that will promote a proper execution. He must then reinforce learning by further repetition (James and Gettigan, 1987).
Flexibility, mobility and suppleness all mean the range of limb movement around joints. Some sports such as gymnastics require a great deal of overall body flexibility. Other sports for example javelin require flexibility in particular parts of the body.

Balance is the body’s ability to keep its equilibrium when stationary or moving, Keeping out equilibrium means keeping our center of gravity over our area of support. If we do not keep our equilibrium we will fall over. Stationary or static, balance is shown in activities such as gymnastics, moving or dynamic, balance is important in most sports. Snow boarders and surfers must have very good dynamic balance. They move very fast over uneven surfaces and must constantly readjust their positions (Beashel and Taylor, 1997)

AEROBIC EXERCISES

Aerobic exercise refers to exercise that involves or improves oxygen consumption by the body. Aerobic means "with oxygen", and refers to the use of oxygen in the body’s metabolic or energy-generating process. (Concise Oxford English Dictionary)

Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time. To obtain the best results, an aerobic exercise session involves a warming up period, followed by at least 20 minutes of moderate to intense exercise involving large muscle groups, and a cooling down period at the end.
BENEFITS OF AEROBIC EXERCISES

1. Strengthening the muscles involved in respiration, to facilitate the flow of air in and out of the lungs
2. Strengthening and enlarging the heart muscle, to improve its pumping efficiency and reduce the resting heart rate, known as aerobic conditioning
3. Toning muscles throughout the body
4. Improving circulation efficiency and reducing blood pressure
5. Increasing the total number of red blood cells in the body, facilitating transport of oxygen
6. Improved mental health, including reducing stress and lowering the incidence of depression (Kolata, Gina 2002)

As a result, aerobic exercise can reduce the risk of death due to cardiovascular problems. In addition, high-impact aerobic activities (such as jogging or jumping rope) can stimulate bone growth, as well as reducing the risk of osteoporosis for both men and women. In addition to the health benefits of aerobic exercise, there are numerous performance benefits:

1. Increased storage of energy molecules such as fats and carbohydrates within the muscles, allowing for increased endurance
2. Neo vascularization of the muscle sarcomeres to increase blood flow through the muscles
3. Increasing speed at which aerobic metabolism is activated within muscles, allowing a greater portion of energy for intense exercise to be generated aerobically
4. Improving the ability of muscles to use fats during exercise, preserving intramuscular glycogen
5. Enhancing the speed at which muscles recover from high intensity exercise (Kolata, Gina 2002)

FLOOR AEROBICS

Aerobic exercise refers to exercise that involves or improve oxygen consumption by the body. The steps that can be choreographed in to an aerobic dance routine can be varied by impact (i.e., high impact versus low impact.) Aerobic dance exercise (ADE) can usually be completed easily by participants of all ages and fitness level.

BENEFITS OF FLOOR AEROBICS

Benefits of aerobic exercise include the ability to utilize more oxygen during exercise, a lower heart rate at rest, the reduction of less lactic acid, greater endurance. Exercise physiologist has found that it reduces blood pressure and changes blood chemistry? It also improves the efficiency of the heart. More evidence is needed to substantiate the belief by some persons that aerobic exercise is reasonable for the development of supplemental blood vessels to heart which would be held in the event of the heart attack, and also that
such exercise results in increasing the size of coronary arteries and thus assisting the flow of blood to the heart if the artery is narrowed by a clot. (Donatelle, Rebecca 2005)

PHYSICAL

Physical means relating to the structure, size, or shape of something that can be touched and seen. Physical qualities, actions, or things are connected with a person’s body, rather than with their mind.

PHYSIOLOGY

The physiology of a human or animal’s body or of a plant is the way that its functions. Physiology is the scientific study of how people’s and animal’s bodies function. The term physiology was derived from a Greek word ‘Physiologikos’ meaning discourse on natural knowledge, physiology deals with the normal functioning of human body (ShamalKaloy, 2007) Exercise physiology is the scientific study of physiological changes in athletes body with the effects of exercise, whether long term or short term. Different environmental changes, namely, altitude, climate, temperature, humidity, nutritional status etc have some close associations with the optimal performance of an athlete. (ShamalKaloy, 2007) For the physiological systems of the body to be fit, they must function well enough to support the scientific activity that the individual is performing moreover different activity make different demands upon
the organism with respect to the circulatory, respiratory, metabolic and neurologic processes which are specific to the activity. (Bangsbo, J. 1996).

High level of performance in sports and games might be dependent upon the physiological make up and it was recognized that physiological proficiency was needed for the high level performance. (Gianetti, G., et al., 2008) For specific physiological systems of the body to be fit, they must function well enough to support the particular game that the player is playing. Since different games make different demands up on the organism with respect of neurological, respiratory, circulatory and temperature regulating functions physiological fitness is specific to the activity. Physiological systems are highly adaptable to exercise. (Gianetti, G., et al., 2008) In order to find out the influence of varied aerobic exercises on physiological variables, the researcher selected variables, vital capacity, resting heart rate, mean arterial blood pressure, breath holding time and respiratory rate.

**PSYCHOLOGY**

Psychology means concerned with a person’s mind and thoughts. Psychology is the science of the activities of an individual in relation to his environment. (Albert V. Carvon, 1980). Dancers often endure long hours of physical exertion and push their bodies to extreme limits in order to advance technically. The importance of
physical health and fitness is not news to dancers and dance educators; however, psychological health and well-being are not discussed as much, yet play a crucial role in dancers’ lives. This article will suggest ways in which dance teachers can help their students achieve optimum psychological wellbeing by utilizing research in positive psychology; a relatively new field that we believe has great relevance to dance. Dance psychology typically looks to sport psychology for evidence and inspiration, but we suggest that a new emerging giant of a field, namely positive psychology, is another useful source. Therefore, this article will briefly introduce three positive psychology topics: self-determination, creativity, and flow. With an understanding of some key terms and how to apply them in class, teachers may be able to nurture healthy intrinsic motivation and thereby raise self-esteem and lower body dissatisfaction. Furthermore, by focusing on psychological factors that underlie excellence in performance, such as flow and creativity, instructors may be able to help their students reach higher levels of achievement.

The understanding of the psychology of emotion requires not only the inclusion of psychological and behavioral data but also the subjective data of feeling, and mood. Increasing attention to mood states and mood changes is respected in the literature on the effects of brief psychotherapies, psychotropic medications and other drugs sleep deprivation, emotional stimulation, and similar experimental
operation. The Profile of Mood States (POMS), has been developed which measures six identifiable mood or affective states. A Total Mood Disturbance (TMD) score, however, may be obtained from the POMS by simply summing the scores across all six factors (weighting Vigor negatively). The Vigor score is to be subtracted from the sum total of the other five scales on the POMS.

**BIO-CHEMICAL**

Biochemistry is the study of the chemical processes in living organisms. It deals with the structure and function of cellular components such as proteins, carbohydrates, lipids, nucleic acids and other bio molecules. Exercises produce biochemical changes in the cardio respiratory system and other important alterations in body composition such as proteins, carbohydrates, lipids and triglyceride levels (Scharhag, et.al. 2008)

**DANCE**

Dance is a particular series of graceful movements of our body and feet, which we usually do in time to music. Sometimes the people doing this dance hold brightly as colored scarves. A dance is a social event where people dance with each other and it is the activity of performing dances, as a public entertainment or an art form. When we dance somewhere, we move there lightly and quickly, usually because we are happy or excited.
Aerobic activity exercises strengthen our heart and lungs and it is a form of exercises which increases the amount of oxygen in our blood. An aerobics exercise gets the heart pumping and helps us to burn up the fat.

As dancers use their bodies for expressive purposes, they frequently over use various body parts when they learn and perform dance techniques. Most dancers invest a great deal of effort in their preparation and this is often associated with Physical, physiological, psychological, and Bio-chemical factors. (Medicina Sportiva. 2012).

AEROBIC DANCE

Aerobic dance is a dance, which develop overall physical fitness and improves excellent activity. Aerobic dance and bharathanatyam have evolved from rigidly choreographed dance routines intended for female participants to free style routines that incorporate random combinations of dance, sport, and exercise movements designed to attract men and women. Bharathnatyam was the dance technique evolved in south of India in Tamilnadu and practiced in the temples of Siva. It is highly specialized science with a traditional background and rigid course and convention. Bharathnatyam skillfully embodies the three primary ingredients of dancing. They are ‘Bava’ or ‘mood’ or ‘Music’ or ‘melody’ and ‘tala’ or ‘timing’. The technique of Bharathnatyam consists of sixty-four
principles of coordinated hand, foot, face, and body movements, which are performed to the accompaniment of dance syllables.

Aerobic means with oxygen and refers to the use of oxygen in the body’s metabolic or energy generating process. The rhythmic movements to music also help develop coordination and balance. In addition, exercising in a group setting provides opportunities for social interactions not afforded by many other aerobic activities. Bharathanatyam conceives of movements in space mostly along either straight lines or in triangles.

"Aerobics" is a particular form of aerobic exercise. Aerobics classes generally involve rapid stepping patterns, performed to music with cues provided by an instructor. This type of aerobic activity became quite popular in the United States after the 1970 publication of The New Aerobics by Dr. Kenneth H. Cooper, and went through a brief period of intense popularity in the 1980s, when many celebrities (such as Jane Fonda and Richard Simmons) produced videos or created television shows promoting this type of aerobic exercise.

Traditional aerobic dance consists of mixture of running, hopping, skipping, jumping, sliding, and swimming moments and a variety of dance steps self to music. During performance of these dance routines there is suspension phase of the body during which both feet one momentarily of the floor. This type of a modification of traditional aerobic dance has evolved called “high impact” aerobic
dance. Recently, a modification of traditional aerobic dance has evolved called “low impact” aerobic dance. In this approach, one foot maintained contact with the floor at all times. Thereby eliminating the suspension phase of the activity thus the incidence of impact type of influence should be lessened with low impact dance. (Donatelle, Rebecca 2005)

Regular physical activity is associated with a healthy, longer life, a lower risk of heart disease, high blood pressure, diabetes, obesity, and some cancers (Eyre, et al., 2004).

CLASSICAL DANCE

Classical dance is the oldest dance in India and this dance is considered as the national dance of our country. The birth place of the classical dance is Tamil Nadu. This classical dance is performed by women. When the dance is performed there is a movement in all parts our body. The rules and regulations for this dance were written by Barathamani. He wrote these rules and taught to his sons. At that time Lord Siva and Parvathi were impressed by this dance and they appreciated the dance. Later Lord Siva said to Parvathi that if this dance was practiced by women it would be more attractive. So Lord Siva taught this dance to Parvathi Devi.

The meaning for this Classical Dance is first we have to bow our head and wish the earth. Next we have to face Lord Siva and we must pray that if any mistake was done by us Lord Siva should forgive us.
At first this Dance was considered only for men. Later in the middle age period this dance was welcomed by women but now there is a great change. The word “Classical” is meant only for women but this was not true.

First we have to pray to God. Next method is “Allarip”. In this more important place was given to God Asiwaram, Varnam, Subthem. The importance was given for facial expression, patham (song) in this symbol and face expressions both were stressed and at last it ends with thillana.

The word “Exercise” refers to conscious and purposeful physical activity usually with sufficient intensity to increase, to some degree, the respiratory and circulatory functions. It refers only to the actual movement process at the time it occurs and should not be confused with conditioning or training.

There are six sets of exercises done continuously from the first to six. Each set consists of ten exercises. This set of exercises can be done with graceful movements, normal speed of rhythm and with uniformity. Participants should perform these exercises together. When the given sets of exercise are learnt, they can be performed with suitable uniform and to music for spectacular appeal. Each exercise should be done for sixteen counts.
BODY SHAPE

Every dancer desires having an ideal body shape for the dance form. In particular, ballet dancers are expected to meet professional expectations of ultra lean body shape, based on aesthetic considerations. To maintain low body weight, some ballet dancers use self-induced vomiting as a way to ameliorate the effects of overeating.

Modern dancers are required to have thin physiques that are less restricted than those considered to be ideal for ballet dancers. Potter, Lavery, and Bell (1996) found that modern dancers were older, heavier, and had more body fat than ballet dancers. In Korean dance, Korean dancers wear Hanbok, which can wrap around wide skirts and covers from the chest to the feet, it is not easy to recognize dancers’ body frames.

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effect of Aerobic dance and Classical dance on selected Physical, Physiological, Psychological and Biochemical variables.

DELIMITATIONS

The following were the delimitations of the study;

1. To achieve the purpose of the study, sixty girls (N=60) were selected as Subjects from Sarach Tucker Girls Higher Secondary School Palayamkottai, TamilNadu, India.
2. The selected subject’s age ranged from 16 to 18 years.
3. Sixty subjects were divided into three groups (N=20), Group I underwent Aerobic dance training, Group II underwent Classical dance training and Group III acted as control group.

4. Bharathanatyam was considered as classical dance for this study.

5. Training period was fixed to 16 weeks on three alternative days per week.

6. The following Physical, physiological, Psychological and biochemical variables were selected as criterion variables and they were assessed with standardized Test items.

7. All the subjects were tested on selected criterion variables prior to and immediately after the training period.

8. The level of significance was fixed at 0.05 level of confidence, which was considered as appropriate.

**LIMITATIONS**

The following were the limitations of the study

1. External factors like life style and health, which may have influenced the results of the study, was not considered.

2. The general mood and environment factors at the time of responding during pre-test and post-test were not considered.

3. The climatic conditions were not considered.
HYPOTHESES

1. It is hypothesized that there may be a significant improvement on selected variables due to the practice of aerobic dance and classical dance.

2. It is hypothesized that there may be a significant difference between the improvement in selected variables.

3. Aerobic dance may show better improvement in selected physical physiological and biochemical variables than classical dance.

4. Classical dance may show better improvement in selected psychological variables than Aerobic dance.

SIGNIFICANCE OF THE STUDY

1. The results may be helpful to compare the effects of Aerobic dance and classical dance on selected variables.

2. The results may help the young people to select a dance programme, which is suitable for them to develop their required fitness variables.

3. The results of the study may add to the quantum of knowledge of contributions of Aerobic dance and classical dance in developing selected variables.

4. The results of study may pave way to the Educations, Sports Administrations, and Fitness managers to evolve a training programme by including this Aerobic dance and classical dance.
DEFINITION OF THE OPERATIONAL TERMS

PHYSICAL FITNESS

Physical fitness implies the ability to function at one’s best level of efficiency in all his daily living. The ability to function efficiently and effectively without injury, to enjoy leisure, to be healthy, to resist disease and to cope with emergency situations is physical fitness.

MUSCULAR STRENGTH

Strength is the amount of muscular force one is capable of exerting in a single muscular contraction. Muscular Strength is defined as the ability of a muscle or muscle group to exert force and to overcome the most resistance in one effort (Luann Voza, 2010).

FLEXIBILITY

It is the functional capacity of a joint to move through a normal range of motion. It is specific to a given joint and is actually more dependent upon the musculature surrounding a joint than on the actual body structure of the joint itself. Flexibility is the ability to move a joint smoothly through its complete range of motion. There are two main types: static flexibility is the ability to move slowly into a stretched position and to hold the body stills (e.g., the ability to sit in a splits position); dynamic flexibility is the ability to move quickly or at normal speed into a stretched position (Oxford Food & Fitness Dictionary, 2012).
MUSCULAR ENDURANCE

This is the quality that enables a person to sustain localized body activities for extended periods of time. Endurance means the act of working very hard without stopping even in the face of difficult situations or pain ("Endurance", 2012).

PHYSIOLOGY

It is a science which deals with the functions of the living organism and its parts, and of the physical and chemical factors and processes involved. The basic processes underlying the functioning of its parts or processes (Dorland’s, 1982)

AEROBIC POWER

Highest amount of oxygen a person can consume during maximal exercise of several minutes duration. It is demonstrated by a leveling off or decline in oxygen consumption with increasing intensity.

ANAEROBIC POWER

Maximal power (work per unit time) developed during all-out, short term physical effort; reflects energy-output capacity of intramuscular high-energy phosphates (ATP and PCr) and/or anaerobic glycolysis.

RESTING HEART RATE

The number of beats felt in exactly one minute (Miller, 1965).
PSYCHOLOGY

Psychology is defined as the science of behavior and cognitive processes (Horn, 1992).

PROFILE OF MOOD STATES (POMS)

POMS has been developed which measures six identifiable mood or affective states. A Total Mood Disturbance (TMD) score, however, may be obtained from the POMS by simply summing the scores across all six factors (weighting Vigor negatively). The Vigor score is to be subtracted from the sum total of the other five scales on the POMS.

BIO-CHEMISTRY

The chemistry of living organisms and of the changes occurring there in.

HIGH DENSITY LIPOPROTEIN (HDL)

HDL can absorb cholesterol as cholesterol esters and regulate its movement from the peripheral tissues back to the liver, achieving as a revenue cholesterol transport system (Ocheri and Kolhatkar, 2000).

LOW DENSITY LIPOPROTEIN (LDL)

LDL is also known as Beta Lipoprotein. It represents a final stage in the catabolism of Very Low Density Lipoprotein (VLDL). It is one of the components of plasma lipoprotein (Mukherjee and Harper’s, 1992).
TOTAL CHOLESTEROL

A steroid lipid that is produced by all cells and whose production is regulated by a reception mediated mechanism in both hepatic and extra hepatic tissues (Baroh, 1996).