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## AN INTERDISCIPLINARY APPROACH TOWARDS STRUCTURED AEROBIC EXERCISE PROGRAMME

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*Abstract: Doing regular exercise is one of many healthy life-styles that contribute to optimal health and quality of life. The study was to find out the effect of Aerobic exercise programme on the selected variables and this programme had improved the Physiological variables and the Resting Heart Rate, and Systolic and Diastolic blood pressure decreases due to the exercise programme*

### INTRODUCTION

"If exercise could be packed in a pill, it would be the single most widely prescribed and beneficial medicine in to a nation" Modern technology has enabled present day society to exist in a world where the concept of hard or even moderate physical work is almost absolute. We are constantly looking for different ways to make life even easier. People of present times have experienced more changes and crises than any other generation. As a result many people lack physical fitness this leads on to the various changes in the body. This changes and crises have altered the human environment.

The World Health Organization (WHO) has set a target to make people health conscious and it is a very right attempt towards attainment of Health-For-All. To achieve this goal developed countries have already initiated with a variety of health

and fitness programmes for the benefits of the citizens of their country. For the over weight, a life style approach to physical activity is more achievable. A structured aerobic programme for 30 to 45 minutes daily for 5 days a week may help to reduce over weight and excess fat contained in the human body.

The physical fitness programme and regular exercise is the solution for the present day man's physical and mental problem. Regular exercise can result in additional psychological benefits apart from the physical benefits like reduction in mental tension; improve sense of well being, improved sleep habits, improved self concept, ability to enjoy leisure, assertiveness, independent and self control.

Physical fitness is one's richest possession. It can't be purchased; it has to be earned through a daily routine of physical exercise. It is evident that fit citizens are a nation's best asset and weak ones are its liabilities. For most of the industrialized nation's fitness of children and youth have been a matter of national concern. It is the responsibility of every country to promote physical fitness of its citizens because physical fitness is the basic requirement for most of the tasks to be undertaken by an individual in his daily life. (Uppal 1992)

Physical fitness consists of many components each of which is specific in nature. It is a combination of several aspects rather than single characteristics. A fit person possesses at least adequate level of health related fitness components and each of the skill-related fitness components. Body composition, cardio vascular fitness, flexibility, muscular endurance and strength are the health related components of physical fitness. Agility, balance, coordination, power, reaction time and speed are the often considered to be the main components of skill-related physical fitness. A minimum amount of physical fitness is very essential for disease prevention and health promotion.

Doing regular exercise is one of many healthy life-styles that contribute to optimal health and quality of life. Aerobic as well as anaerobic exercise is used as a means to develop physical fitness. Dance aerobics was first popularized by Jack

Sorenson in 1970's, as "aerobic dance" since then, other versions of the activity have been promoted as rhythmic aerobics. In most cases dance aerobics consisted of a pre planned or choreographed series of dance steps and exercise done to music. Fifteen years ago, the term aerobic dance was known to very few people. Dr Kenneth H.Cooper was conducting tests to measure aerobics capacity (the efficiency of the heart and lungs in processing O<sub>2</sub>) .Aerobic dance can best be defined as continuous movement exercise, locomotors movement and dance steps performed to music. The variety and style of the movement and the musical accompaniment provide as many forms of aerobic dance programme as there are interest and tastes of people performing them. In contrast to a competitive or solitary fitness programme aerobic dance provides an opportunity for people of widely different levels of physical activity to participate together in the same facility, with same musical accompaniment, engaging in exercise and skill which have been choreographed according to the needs of each individual.

An aerobic dance works out is divided in to four phases: Warm-up, skill review, aerobic and cool down. Each phase has its own purpose with out which the work out is incomplete. Each phase of the programme is necessary if aerobic dance is to provide the desired benefits. The heart becomes stronger and more effective as a pump resulting in a slower resting heart rate and a smaller increase in exercise heart rate for a given amount of work. The strength and endurance of the respiratory muscles increase resulting in an increase of the interior volume of the lungs. Consequently , more interior surface is available for the exchange of gases with the circulatory system, which again allows you to exercise longer and at a higher intensity before become fatigued. The capillaries the tiny blood vessels that deliver nutrients to tissue increase in number and provide more surface area for the exchange of O<sub>2</sub> and carbon-dioxide between the blood and cells. This increase in capillaries also speed up the rate of exchange of nutrients and the removal of waist products of cell metabolism so that the efficiency of food digestion and waste elimination is increased. Since dance aerobics is consist of pre planned

or choreography series of dance steps and exercise done to music, it is considered to be an enjoyable way to condition cardio respiratory system. Exercising to music in a group setting seems to remove some of the drudgery that many people experience in trying to maintain an exercise programme along. Thus the combined effects of aerobics and recreational activities like dance and music are said to not only improve health related fitness but also help in relaxing mind from day-to-day tension. This can be performed at home when individuals can find time from their daily routine.

For the past few decades people have been growing more conscious about their health. However due to industrialization and high completions for living, people get very less time to concentrate on their health. Even those people who had involved in some sort of physical activities in the past do not get time to maintain their fitness. One of the expert on fitness, Jacki Sorenson had rightly said "You cannot store physical fitness so you have got to work activity in to every week of your life"

#### **Selected variables:-**

- I Physiological Variables : a) Resting Heart rate  
b) Blood Pressure (Systolic and Diastolic)
- II Physical Variables : a) Body Composition  
b) Flexibility

#### **METHODOLOGY**

Sixty women students (N=60) studying in MarTheophilus Training College Nalanchira were selected as the subjects. They were equally divided in to two groups (n=30) of which one group acted as experimental group and other group acted as control group. All the subjects were tested before and after the studies.

#### **The tested variables were:-**

- I. Physiological Variables : a) Resting Heart rate  
b) Blood Pressure (Systolic and Diastolic)

II. Physical Variable : a) Body Composition  
b) Flexibility

### RESTING PULSE RATE

Purpose: - The purpose of the test was to measure the resting heart rate.

Equipment: - A stop watch

PROCEDURE:- The investigator recorded the pulse rate by palpating the radial artery for one full minute for each subjects. Before taking the pulse rate the subjects were asked to sit on a chair and relax. The resting pulse was taken at early morning.

Scoring: - The number of pulse rates counted in one minutes

### BLOOD PRESSURE

Purpose : - The purpose of this test was to measure the blood pressure of the subject.

Equipments: - Standardized sphygmomanometer and a stethoscope.

Procedure: - Standardized sphygmomanometer and a stethoscope were used to use for measuring blood pressure. The subject was placed in a comfortable position before the measurement was taken. While taking blood pressure the subjects left arm was completely bared to make certain that the clothing didn't constrict the blood vessel. The measurement was taken with the subject in sitting position. The cuff was wrapped around the arm evenly with lower edge approximately one inch above the antecubital space. It was made sure that the stethoscope was free from contact with the cuff. The cuff was inflated until the artery was fully collapsed to the extent that no pulse beat could be heard. Pressure of the cuff was then slowly released as the investigator watched the gauge. When sound of the pulse become audible the reading in millimeter of increasing (mm of Hg) at that instant was recorded as the systolic pressure. The pressure was further released gradually as the sound of the pulse changed in intensity and quality. The index of the diastolic pressure was noted in mm of Hg when the heart beat sound completely ceased.

Scoring: - The values were recorded in mm of Hg

## BODY FAT

Purpose: - The purpose of this test was to measure percentage of body fat in the subjects.

Equipments: - A standardized skin fold calipers.

PROCEDURE:- The investigator picked up a fold of subcutaneous tissue firmly between the thumb and index finger of the left hand and pulled away from the underlying muscle from the spot marked on the subject's body. The jaws of the caliper were then applied 1 cm below the finger of the left hand and allow existing this full pressure before the reading of the thickness was taken within second. In order to be sure that the muscular tissue was not included in the pinch, the subject was asked to perform appropriate movement at that site. Measurement was taken on the dominant side of the body.

Scoring: - The reading of the four sites (Biceps, Triceps, Subcapular, and suprailliac) as recorded by Durnin and Rahman. Then it was converted into percentage.)

## FLEXIBILITY

Purpose: - To measure flexibility of the lower back

Equipment: - Standardized sit and reach test apparatus.

Performer assumed a sitting position on floor knees fully extended and soles of feet against bench. Performer flexed trunk four times with arms fully extended and hands on top of each other. Tester placed a yard sticks with fifteen inches mark at near edge of bench. Measurement approaching mark (not being able to reach the toe are scored negative while those beyond fifteen beyond fifteen inches mark are scored positive) was measured to the nearest  $\frac{1}{4}$  inches.

## ANALYSIS OF DATA AND RESULTS OF THE STUDY

A total of 60 subjects were divided into two equal groups, each group consisting of thirty subjects, out of which one group acted as experimental group and other group served as control group. The experimental group underwent the aerobic exercise for a period of twenty four weeks and the control group did not take part any sort of exercise programme. All the subjects of the two groups were tested on selected variables: Physical and physiological parameters. The test were conducted prior to and after the training period.

To find out the difference in each variable due to the application of aerobic exercise programme, t- test was applied to examine the differences.

### Findings

Finding pertain the effect of Aerobic programme on each of the selected variables have been given below.

Table I: *The statistical results of the experimental group on selected variables*

Variables	Stage	Mean	Std. Deviation	Mean Difference	t -value	P-value
Resting pulse rate	Pre Test	81.633	5.968	2.767	3.160*	P<0.01
	Post Test	78.867	5.704			P<0.01
Systolic Blood pressure	Pre Test	121.400	4.673	2.833	2.980*	P<0.01
	Post Test	118.567	5.380			P<0.01
Diastolic blood pressure	Pre Test	82.533	5.882	2.433	2.880*	P<0.01
	Post Test	80.100	6.127			P<0.01
Flexibility	Pre Test	4.817	1.936	-0.700	7.918*	P<0.01
	Post Test	5.517	1.754			P<0.01
Body Fat	Pre Test	17.890	2.811	0.953	5.977*	P<0.01
	Post Test	16.937	2.675			P<0.01



## THE STATISTICAL RESULTS OF THE CONTROL GROUP ON SELECTED VARIABLES

### Resting pulse rate

The pre-test mean score of experimental group in Resting Pulse Rate is 81.633 with standard deviation 5.968 and that of post test mean is found to be 78.867 with standard deviation 5.704. So the mean difference is 2.767. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t value is 3.160. Since the obtained t-value is greater than the corresponding P-value and the difference is statistically significant at 0.01 level.

Table II : *The statistical results of the control group on selected variables*

Variables	Stage	Mean	Std. Deviation	Mean Difference	t -value	P-value
Resting pulse rate	Pre Test	82.567	5.036	0.733	1.068	P>0.05
	Post Test	81.833	5.246			P>0.05
Systolic Blood pressure	Pre Test	120.833	7.715	-0.700	1.691	P>0.05
	Post Test	121.533	7.394			P>0.05
Diastolic blood pressure	Pre Test	82.800	6.381	-0.067	0.311	P>0.05
	Post Test	82.867	5.917			P>0.05
Flexibility	Pre Test	4.833	1.709	-0.100	1.401	P>0.05
	Post Test	4.933	1.741			P>0.05
Body Fat	Pre Test	17.153	3.209	0.087	0.861	P>0.05

The table II shows that the pre test mean score of control group in Resting Pulse Rate is 82.567 with standard deviation 5.036 and that of post test mean is found to be 81.833 with standard deviation 5.246. So the mean difference is 0.733. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The

calculated t value is 1.068. Since the obtained t-value is less than the corresponding P-value, and the difference is not statistically significant at .05 level.

### **Systolic Blood pressure**

It is evident from the table I that the pre test mean of experimental group in systolic blood pressure is 121.400 with the standard deviation 4.673. The post test mean is found to be 118.567 and standard deviation 5.380. Hence the mean difference is 2.833. To examine whether this difference between the means is statistically significant, a paired sample t-test is used. The calculated t-value is 2.980. Since the obtained t-value is greater than the corresponding P-value and the difference is statistically significant at .01 level. The table II shows that the pre test mean score is 120.833 of control group in Systolic Blood pressure with standard deviation 7.715 and that of post test mean is found to be 121.533 with standard deviation 7.394. So the mean difference is -0.700. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t-value is 1.691. Since the obtained t value is less than the corresponding P-value, and the difference is not statistically significant at .05 level.

### **Diastolic blood pressure**

The table I shows that the pre test mean of experimental group in Diastolic blood pressure is 82.533 with the standard deviation 5.882 and that of post test mean is found to be 80.100 and standard deviation 6.127. However the mean difference is 2.433. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t-value is 2.880. Since the obtained t-value is greater than the corresponding P-value and the difference is statistically significant at .01 level.

The table II shows that the pre test mean score is 82.800 of control group in Diastolic blood pressure with standard deviation 6.381. The post test mean is

found to be 82.867 with standard deviation 5.917. So the mean difference is -0.067. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t value is .0311. The obtained t value is less than the corresponding P-value, and the difference is not statistically significant at .05 level.

**Flexibility :** It is evident from the table I that the pre test mean of experimental group in Flexibility is 4.817 with the standard deviation 1.936 and that of post test mean is found to be 5.517 and standard deviation 1.754. The mean difference is -0.700. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t-value is 7.918. Since the obtained t-value is greater than the corresponding P-value, and the difference is statistically significant at .01 level. The table II shows that the pre test mean score is 4.833 of control group in Flexibility with standard deviation 1.709 and that of post test mean is found to be 4.933 with standard deviation 1.741. So the mean difference is -0.100. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t-value is 1.401. Since the obtained t-value is less than the corresponding P-value, and the difference is not statistically significant at .05 level.

**Body fat :** It is evident from the table I that the pre test mean of experimental group in Body fat is 17.890 with the standard deviation 2.811 and that of post test mean is found to be 16.937 and standard deviation 2.675. Hence the mean difference is 0.953. To examine whether this difference between the means is statistically significant, a paired sample t test is performed. The calculated t-value is 5.977. Since the obtained t-value is greater than the corresponding P-value, the difference is statistically significant at .01 level. The table II shows that the pre test mean score of control group in Body fat is 17.153 with standard deviation 3.209 and that of post test mean is found to be 17.067 with standard deviation 3.054. So the mean difference is 0.087. To examine whether this difference between the means is statistically significant, a paired sample t-test is performed. The calculated t-value is 0.861. Since the obtained t-value is less than the corresponding p-value, and the difference is not statistically significant at .05 level.

## DISCUSSION OF FINDINGS

Health and fitness are significantly affected by a proportionate ratio of excess fat mass to lean muscle mass stores. Fat weight gain occurs from eating more calories than those metabolized during the production of energy. Obesity results from a combination of environmental factors, like: low level of physical activity, excessive intake of high-energy food, and genetic predisposition to storage of fat. Excess fat weight compromises health and is evidenced by a higher rate of coronary heart disease, hypertension, dyslipidemias, diabetes, gallstones, osteoarthritis, and cancers of the reproductive organs in the obese population.

The potential benefits of regular physical activity in reducing obesity are well documented. Regular exercise expends calories that can result in reduced fat storage in the body's fat cells. At the same time, exercise designed to build muscle fitness increases lean body tissue (muscle), which can result in a lesser relative percentage of fat in the body and a higher resting metabolism. Physical activity has great potential for reducing the incidence of obesity in our society.

Women are genetically pre-determined to have a greater amount of body fat than men. Women need more body fat in order to maintain the normal reproductive processes of menstruation and pregnancy. In addition, fat is absolutely essential for many other human physiological processes such as nerve conduction, insulation of organs and insulation from cold, proper skin health, and transport of vitamins, to name a few.

Exercise plays an important role in weight control by increasing energy output, calling on stored calories for extra fuel. Recent studies show that not only does exercise increase metabolism during a workout, but it causes your metabolism to stay increased for a period of time after exercising, allowing you to burn more calories

## CONCLUSION

This study enlighten the effect of Aerobic exercise programme on Physical and Physiological parameters of 60 female students from MarTheophilus Training College. The experimental group underwent the Aerobic training programme for a period of six moths (24 weeks) and control group did not take part any exercise programme. The effect of Aerobic exercise programme on the selected variables in experimental group seems to be the best exercise programme because it was proved that has got a tremendous significant impact on all the variables tested.

This programme had improve the Physiological variable where the Resting Heart Rate and Systolic and Diastolic blood pressure decreases due to the exercise programme . The Physical aspects where the Body Fat decreased and the Flexibility increased.

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