EFFECTS OF AEROBIC EXERCISE PROGRAMME ON DIFFERENT TERRAINS ON BLOOD PRESSURE AND VITAL CAPACITY

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ABSTRACT

The purpose of the present study was to find out the effect of aerobic exercise programme on different terrains on blood pressure and vital capacity among middle aged women. For this purpose, thirty middle aged women residing at various places around Chennai city, Tamilnadu, were selected as subjects. The age of the subjects were ranged from 35 to 45 years. They were divided into three equal groups, each group consisted of ten subjects, in which experimental group - I underwent aerobic exercise as brisk walking on beach sand, experimental group - II underwent aerobic exercise as brisk walking on grass and group - III acted as control that did not participate in any special activities apart from their regular day-to-day activities. The training period for the study was five days (Monday to Friday) in a week for twelve weeks. Prior and after the experimental period, the subjects were tested on systolic and diastolic blood pressure and vital capacity. Systolic and diastolic blood pressure was assessed by using sphygmomanometer and the vital capacity was assessed by using expirograph. The Analysis of Covariance (ANCOVA) was applied to find out any significant difference between the experimental groups and control group on selected criterion variables. The result of the study shows that the brisk walking on beach sand group and brisk walking on grass group was decreased the blood pressure and increased the vital capacity significantly. It was concluded from the results of the study that brisk walking on beach sand and brisk walking on grass has bring positive changes in systolic and diastolic blood pressure and vital capacity as compare to the control group. Moreover it was also concluded that there was no significant difference was found between the experimental groups in all criterion variables.

Key words: *Brisk walking on beach sand, Brisk walking on grass, blood pressure (systolic and diastolic,) vital capacity, ANCOVA.*

INTRODUCTION

Aerobic exercise is a kind of physical exercise which improves the efficiency of the cardiovascular system in absorbing and transporting oxygen. Aerobic means, relating to, involving or requiring free oxygen [**Cooper, Kenneth H.** (1997)] and it also refers the use of oxygen to adequately meet energy demands during exercise through aerobic metabolism.[**McArdle; Katch and Katch** (2006)].

The most available and simplest aerobic exercise is walking. Everyone can walk almost anywhere such as outdoors or indoors like malls, treadmill etc. This makes walking easy to continue throughout the year. The first and good choice for starting any exercise programme is walking.

Walking is good for the muscles because all the muscles in our body contract at the time of walking. We might feel a little pain when we start off because our body is not in the habit of exercising.[**Meghna Mukerjee**, "The Many Benefits of Walking", [2014]] Regular walking of a moderate to vigorous intensity has been shown to benefit both cardiovascular and psychological health.[**Morgan A, Tobar D and Snyder L,** (2010)] Psychological benefits include improved sense of well-being, more positive (i.e., vigor) and less negative (i.e., tension, depression) feelings and mood states and enhanced self-esteem.[**Barton J, Hine R and Pretty J**, (2009), **Biddle S and Mutrie N,** (2008)].

Hypertension is a major health problem. Elevated systolic and diastolic blood pressure levels are associated with a higher risk of developing coronary heart disease (CHD), congestive heart failure, stroke and kidney failure. There is a one-fold increase in developing these diseases when blood pressure is 140/90 millimeters of mercury (mm Hg).[**Bouchard C and Despres JP**, [1995)]

Regular physical activity can help keep thinking, learning, and judgment skills sharp. It can also reduce the risk of depression and may help one to sleep better. .[Retrieved from http://www.cdc.gov/physicalactivity/everyone/health/index.html?s_cid=cs_284]

METHODOLOGY

Thirty middle aged women from various places around Chennai city, Tamilnadu were selected as subjects. The age of the subjects were ranged from 35 to 45 years. The

selected subjects were divided into three equal groups, each group consisted of ten subjects, in which group - I (n = 10) underwent brisk walking on beach sand, experimental group - II (n = 10) underwent brisk walking on grass and group - III (n = 10) acted as control, which did not participate in any special activities apart from their regular curricular activities. The two different training programmes were conducted five days (Monday to Friday) per week for twelve weeks. The researcher consulted with the yoga experts and selected the following variables as criterion variables: 1. Systolic blood pressure, 2. Diastolic blood pressure and 3.Vital capacity. Systolic and diastolic blood pressure was assessed by using sphygmomanometer and vital capacity was assessed by using expirograph. For the purpose of collection of data, the subjects were asked to report at early morning, one day prior and one day after experimental period, in fasting condition.

Analysis of covariance (ANCOVA) was applied to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as appropriate. After applying the analysis of covariance, the result of this study shows that there was a significant increase in breath holding time, decrease in vital capacity and high density lipoprotein levels.

RESULTS

The data collected on systolic blood pressure and vital capacity among experimental and control groups were analyses and the results were presented in Table – I.

Table - I

ANALYSIS OF COVARIANCE ON SELECTED CRITERION VARIABLES AMONG EXERCISE GROUPS AND CONTROL GROUP

Variable Name	Group Name	Brisk Walking on Beach Sand Group	Brisk Walking on Grass Group	Control Group	'F' Ratio
Systolic Blood Pressure (mmHg)	Pre-test Mean ± S.D	89.2 ± 3.994	88.9 ± 4.99	87.9 ± 4.41	0.230
	Post-test Mean ± S.D.	86.8 ± 4.32	87.8 ± 5.03	89.5 ± 3.54	0.991
	Adj. Post-test Mean	86.33	87.594	90.175	11.42*

Diastolic Blood Pressure (mmHg)	**Pre-test Mean ± S.D**	218.3 ± 7.21	219.1 ± 6.19	219.8 ± 9.55	0.093
	Post-test Mean ± S.D.	215.8 ± 6.62	215.5 ± 6.99	222.9 ± 8.77	3.102
	Adj. Post-test Mean	216.508	215.469	222.224	24.538*
Vital capacity (Liters)	**Pre-test Mean ± S.D**	2.382 ± 0.097	2.318 ± 0.075	2.365 ± 0.16	0.825
	Post-test Mean ± S.D.	2.611 ± 0.103	2.531 ± 0.107	2.357 ± 0.153	11.06*
	Adj. Post-test Mean	2.587	2.564	2.348	34.43*

*Significant .05 level of confidence. (The table values required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.21 respectively).

Table – I shows that pre and post test means ‘f ratio of brisk walking on beach sand group, brisk walking on grass group and control group on systolic blood pressure were 0.315 and 0.107, which were insignificant at 0.05 level of confidence. The adjusted post test mean ‘f’ ratio value of experimental groups and control group was 12.71, which was significant at 0.05 level of confidence. The pre and post test means ‘f ratio of brisk walking on beach sand group, brisk walking on grass group and control group on diastolic blood pressure were 0.230 and 0.991, which were insignificant at 0.05 level of confidence. The adjusted post-test mean ’f’ ratio value of experimental group and control group was 11.42, which was significant at 0.05 level of confidence. The pre and post test means ‘f ratio of brisk walking on beach sand group, brisk walking on grass group and control group on vital capacity were 0.825 which was not significant and 11.06 which was significant at 0.05 level of confidence. The adjusted post test mean ‘f’ ratio value of experimental groups and control group was 34.43, which was also significant at 0.05 level of confidence. Further which of the paired Further to determine which of the paired means has a significant difference among the groups, the Scheffé *S* test was applied.

Table - II
Scheffĕ S Test for the Difference Between the Adjusted Post-Test Mean of Selected Criterion Variables

Adjusted Post-test Mean on Systolic Blood Pressure				
Brisk Walking on Beach Sand Group	**Brisk Walking on Grass Group**	**Control Group**	**Mean Difference**	**Confidence interval at .05 level**
131.062		134.338	3.276*	1.733405
131.062	131.90		0.838	1.733405
	131.90	134.338	2.438*	1.733405
Adjusted Post-test Mean on Diastolic Blood Pressure				
Brisk Walking on Beach Sand Group	**Brisk Walking on Grass Group**	**Control Group**	**Mean Difference**	**Confidence interval at .05 level**
86.330		90.175	3.845*	2.111678
86.330	87.594		1.264	2.111678
	87.594	90.175	2.581*	2.111678
Adjusted Post-test Mean on Vital capacity				
Brisk Walking on Beach Sand Group	**Brisk Walking on Grass Group**	**Control Group**	**Mean Difference**	**Confidence interval at .05 level**
2.587		2.348	0.239*	0.08241
2.587	2.564		0.023	0.08241
	2.564	2.348	0.216*	0.08241

* Significant at .05 level of confidence.

Table – II shows that the Scheffĕ *S* Test for the difference between adjusted post-test mean on systolic blood pressure of brisk walking on beach sand group and control group (3.276) and brisk walking on grass group and control group (2.438), which were significant at .05 level of confidence. There was a significant difference on diastolic blood pressure between brisk walking on beach sand group and control group (3.845) and brisk walking on grass group and control group (2.581) and also there was a significant difference on vital capacity between brisk

walking on beach sand group and control group (0.239) and brisk walking on grass group and control group (0.216) which was significant at 0.05 level of confidence after the respective training programme. Moreover the result of the study shows that there was no significant difference between the training groups on selected criterion variables.

CONCLUSIONS

1. There was a significant reduction in blood pressure for walking on sand group and walking on grass group when compared with the control group. The result of the study also shows that there was no significant difference between the training groups on blood pressure. **Sohn, Hasnain and Sinacore** (2007) found that walking with extra 30 minutes has reduced the blood pressure in hypertension patients after six months of trial. **Stewart**, *et al* (2006) found that there was a significant decrease in SBP and DBP after the aerobic exercise and resistance training.

2. The result of the present study shows that there was a significant increase in vital capacity for both the experimental groups when compared with the control group. **Davis and Mackinnon** (2006) found that there was a significant improvement in vital capacity after the recreational activity.

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