

Effect of Circuit Training and Par course Training on Resting Pulse Rate and Blood Pressure

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Abstract

The purpose of the present study was to find out the effect of circuit training and parcourse training on resting pulse rate, systolic and diastolic blood pressure. For this purpose, forty five male students studying various colleges affiliated to the Madurai Kamaraj University, Madurai with age group of 18 to 25 years, were selected as subjects. They were divided into three equal groups, each group consisted of fifteen subjects, in which group – I underwent circuit training, group – II underwent parcourse training and group – III acted as control which did not participate any special training, except their regular curricular activities. The training period for this study was three days in a week for twelve weeks. Prior to and after the training period, the subjects were tested for resting pulse rate, systolic and diastolic blood pressure. The selected criterion variables, such as, resting pulse rate was tested by counting the pulse at radial artery during the resting condition and systolic and diastolic blood pressure were tested by using sphygmomanometer. The Analysis of Covariance (ANCOVA) was applied as statistical tool. Whenever the post-test means found significant, the Scheffé *S* was applied as post-hoc test. In all cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. It was concluded from the results of the study that the training groups have reduced the resting puls rate and systolic and diastolic blood pressure.

KEYWORDS: Circuit Training, Parcourse training, resting pulse rate, Systolic and Diastolic Blood pressure.

INTRODUCTION

Physical training is one of the most important ingredients in training to achieve high performance. The objectives of physical training are to increase the athlete's physiological potential and to develop biomotor abilities to the highest standards (Tudor O. Bumpa, 1999).

The term circuit refers to a number of carefully selected exercises arranged consecutively. In the original format, 9 to 12 stations comprised the circuit. This number may vary according to the design of the program. Each participant moves from one station to the next with little (15 to 30 seconds) or no rest, performing a 15 to 45 second work bout of 8 to 20 repetitions at each station (using a resistance of about 40% to 60% of one-repetition maximum). (Len Karviz, 1996)

A new concept of circuit training developed in Europe has been adopted recently in the United States and Canada called 'parcourse'. It consists of a series of stations set up over a one to two and a half mile path, to provide a recreational exercise circuit for individuals of all ages and abilities. (William E. Prentice and Charles A. Bucher, 1988).

The rhythmic expansion and contraction of the arteries corresponding each beat of heart is referred to as the pulse in the medical field. (<http://www.buzzle.com/articles/normal-pulse-rate.html>)

Blood pressure (BP) is a force exerted by circulating blood on the walls of blood vessels, and is one of the principal vital signs. (http://en.wikipedia.org/wiki/Blood_pressure)

Methods

The purpose of the present study was to find out the effect of circuit training and parcourse training on resting pulse rate, systolic and diastolic blood pressure. For this purpose, forty five male students studying various colleges affiliated to the Madurai Kamaraj University, Madurai with age group of 18 to 25 years, were selected as subjects. They were divided into three equal groups, each group consisted of fifteen subjects, in which group – I underwent circuit training, group – II underwent parcourse training and group – III acted as control which did not participate any special training, except their regular curricular activities. The training period for this study was three days in a week for twelve weeks. Prior to and after the training period, the subjects were tested for resting pulse rate, systolic and diastolic blood pressure. The selected criterion variables, such as, resting pulse rate was tested by counting the pulse at radial artery during the resting condition and systolic and diastolic blood pressure were tested by using sphygmomanometer. .

Analysis of the Data

Analysis of covariance was used to determine the differences, if any, among the adjusted post test means on selected criterion variables separately. Whenever the 'F' ratio for adjusted posttest mean was found to be significant, the Scheffé S test was applied as post-hoc test. The level of significance was fixed at .05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

Table – I

Analysis of Covariance and 'F' ratio for Resting Pulse Rate, Systolic and Diastolic Blood Pressure of Circuit Training and Parcourse Training Groups and Control Group

Variable Name	Group Name	Circuit Training Group	Parcourse Training Group	Control Group	'F' Ratio
Resting Pulse Rate (in No./min)	Pre-test Mean \pm S.D	73.27 \pm 4.22	72.47 \pm 3.07	73.53 \pm 3.33	1.905
	Post-test Mean \pm S.D.	69.04 \pm 1.298	71.80 \pm 3.51	72.80 \pm 3.14	5.752
	Adj. Post-test Mean	70.425	70.942	72.633	23.706*
Systolic Blood Pressure (in mmHg)	Pre-test Mean \pm S.D	112.33 \pm 1.88	114.3 \pm 4.32	113.73 \pm 4.72	1.064
	Post-test Mean \pm S.D.	110.53 \pm 0.99	112.2 \pm 4.16	114.13 \pm 4.78	3.551*
	Adj. Post-test Mean	111.584	111.397	113.886	29.24*

Diastolic Blood Pressure (in mmHg)	Pre-test Mean \pm S.D	71.20 \pm 1.82	73.20 \pm 3.49	72.47 \pm 2.95	1.91
	Post-test Mean \pm S.D.	69.40 \pm 1.298	71.80 \pm 3.51	72.80 \pm 3.14	5.75*
	Adj. Post-test Mean	70.425	70.942	72.633	23.706*

* Significant at .05 level of confidence. (The table value required for significance at .05 level with df 2 and 42 and 2 and 41 are 2.21 and 3.22 respectively).

Table - II

Scheffé S Test for the Difference Between the Adjusted Post-Test Mean of Resting Pulse Rate, Systolic and Diastolic Blood Pressure

Adjusted Post-test Mean on Resting Pulse Rate				
Circuit Training Group	Parcourse Training Group	Control group	Mean Difference	Confidence interval at .05 level
70.425		72.633	2.208*	0.847557
70.425	70.942		0.517	0.847557
	70.942	72.633	1.691*	0.847557
Adjusted Post-test Mean on Systolic Blood Pressure				
111.584		113.886	2.302*	0.362399
111.584	111.397		0.187	0.362399
	111.397	113.886	2.489*	0.362399
Adjusted Post-test Mean on Diastolic Blood Pressure				
70.425		72.633	2.208*	0.847557
70.425	70.942		0.517	0.847557
	70.942	72.633	1.691*	0.847557

*Significant at .05 level of Confidence.

Results

Table – I showed that there was a significant difference among circuit training group, parcourse training group and control group on resting pulse rate, systolic and diastolic blood pressure.

Table – II shows that the Scheffé S test on resting pulse rate for the difference between adjusted post-test mean of between circuit training group and control group (2.208), and parcourse training group and control group (2.388), which were significant at .05 level of confidence. But the adjusted post-test mean difference between circuit training group and parcourse training group (0.517) was insignificant.

Table – II shows that the Scheffé S test on systolic blood pressure for the difference between adjusted post-test mean difference of circuit training group and control group (2.302), and parcourse training group and control group (2.489), which were significant at .05 level of confidence. But the result of the study shows that there

was no significant difference between circuit training group and parcourse training group (0.187) was existed.

Table – II shows that the Scheffè *S* test on diastolic blood pressure for the difference between adjusted post-test mean of circuit training group and control group (2.208), and parcourse training group and control group (1.691), which were significant at .05 level of confidence. The result of the study shows that there was no significant difference between circuit training group and parcourse training group (0.517) was existed on diastolic blood pressure.

Conclusions

1. It was concluded from the results of the study that the resting pulse rate was reduced for circuit training group (**Patricia Elizabeth Mosher** (1989) and **Atul Meethal and AM. Najeeb** (2013)), and parcourse training group (**Rajamohan** (2001) and **Padmanabhan** (2000)). The reduction in systolic and diastolic blood pressure for both the training groups (**Antonio Paoli et al**, (2013), **Matthew B. Miller et al** (2014) and **Atul Meethal and AM. Najeeb** (2013)) was significant.

2. When compared with the control group, the training groups has significantly decreased on selected criterion variables, such as, resting pulse rate, systolic and diastolic blood pressure.

3. There was no significant difference was found between the training groups on selected criterion variables such as, resting pulse rate, systolic and diastolic blood pressure

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