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EFFECT OF AEROBIC TRAINING RESISTANCE TRAINING AND CONCURRENT TRAINING ON MEAN ARTERIAL BLOOD PRESSURE AMONG COLLEGE BOYS

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ABSTRACT

The purpose of the study was to find out the effect of aerobic training, resistance training and concurrent training on resting heart rate among college boys. To achieve this purpose of the study, sixty college students were selected as subjects who were from the Nagaland University. The selected subjects were aged between 18 to 22 years. They were divided into four equal groups of fifteen each, Group I underwent aerobic training, Group II underwent resistance training, Group III underwent concurrent training and Group IV acted as control that did not participate in any special training apart from their regular curricular activities. The subjects were tested on selected criterion variable such as mean arterial blood pressure prior to and immediately after the training period. The selected criterion variable such as mean arterial blood pressure was determined through using Sphygmomanometer. The analysis of covariance (ANCOVA) was used to find out the significant differences if any, between the experimental group and control group on selected criterion variable. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. The result of the present study has revealed that there was a significant difference among the experimental and control group on mean arterial blood pressure.

Keywords

meanarterialblood pressure -aerobic training-resistance training-concurrent training-sports.

1. INTRODUCTION

The primary objective of sports training is to stress various bodily systems to bring about positive adaptation in order to enhance sporting performance. To achieve this objective, coaches and athletes systematically apply a number of training principles including overload, specificity and progression, organized through what is commonly termed periodisation. The application of these principles involves the manipulation of various programme design variables including choice of exercise, order of training activities/exercises, training intensity (load and repetition), rest periods between sets and activities/exercises and training frequency and volume in order to provide periods of stimulus and recovery, with the successful balance of these factors resulting in positive adaptation. Aerobic exercise refers to exercise that involves or improve oxygen consumption by the body. Aerobic training increased cardio-respiratory endurance, which in turn increased Vo_2 max, because of it increased level of hemoglobin. Resistance training is an integral part of an adult fitness program and of a sufficient intensity to enhance strength, muscular endurance and maintain fat free mass. Resistance training involves exercise in which the muscles exert a force against an external load. It is most commonly referred to as weight training. Such a training program should be individualized, progressive and specific in terms of the way muscles are likely to be used in the chosen sport. The physiological response to dynamic

aerobic exercise is an increase in oxygen consumption and heart rate that parallels the intensity of the imposed activity and a curvilinear increase in stroke volume. The cardiovascular system, composed of the heart, blood vessels and blood responds predictably to the increased demands of exercise. With few exceptions, the cardiovascular response to exercise is directly proportional to the skeletal muscle oxygen demands for any given rate of work and oxygen uptake increases linearly with increasing rates of work. A person's maximum oxygen uptake is a function of cardiac output multiplied by the arterial-mixed venous oxygen difference. Cardiac output thus plays an important role in meeting the oxygen demands for work. As the rate of work increases, the cardiac output increases in a nearly linear manner to meet the increasing oxygen demand, but only up to the point where it reaches its maximal capacity. The resting heart rate can be obtained through auscultation, palpation or ECG recordings. When taking heart rate by auscultation, the bell of the stethoscope is placed to the left of the sternum, just above the level of the nipple. The heart beats can be counted

1.1 Objectives of the study

The main objective of the study was to assess the effect of aerobic training, resistance training and concurrent training on mean arterial blood pressure which would help to enhance physical fitness of college boys. The present study was designed to obtain the data on the college boys from Nagaland University.

1.2 Statement of the problem

The purpose of the study was to determine the effect of aerobic training, resistance training and concurrent training on mean arterial blood pressure among college boys.

1.3 Delimitations

1. The study was delimited to Nagaland University affiliated colleges.
2. The study was delimited to 60 college students; their age was 18 to 22 years.
3. The study was restricted to the dependent variable is mean arterial blood pressure and independent variables are aerobic training, resistance training and concurrent training.

1.4 Significance of the Study

1. The findings of the study may be helpful for college students to apply aerobic, resistance and concurrent training which will help in better health and fitness.
2. The findings of the study would be helpful for the exercise physiologist to know the role of mean arterial blood pressure influence their physical fitness.
3. The results of the study may be helpful to fitness trainers, coaches, physical educationist and exercise physiologists to design proper training protocol for other populations.

2. METHODOLOGY

In the present study all the students studying in higher educational institutions' of Nagaland University area were considered as population for the study. A representative sample of 60 college students in the age of 18-22 years was chosen as sample for the study. The selected participants were divided into four groups. Group I underwent aerobic training, group II underwent resistance training, group III underwent concurrent training and group IV act as control group. The experimental groups underwent eight weeks of training in their particular workout. For this study dependent variable is mean arterial blood pressure.

2.1 Test Administration – Mean Arterial Blood Pressure

The subject was asked to sit with feet flat, legs uncrossed, the arm free of any clothing and relaxed. The arm was kept on a table to the heart level and back well supported and rested comfortably on a chair for 5 minutes. The cuff of Sphygmomanometer was wrapped around the upper arm above the elbow of the subject. The cuff was then inflated with air pressure by pumping up a hand bulb

and placed the stethoscope completely over their brachial artery. This air pressure inside the cuff is higher than the systolic blood pressure, the artery remains occluded or collapsed and no sound is heard through the applied stethoscope in the antecubital fossa. When the artery is occluded, no blood will flow past the point of occlusion. Then the air pressure was slowly released as tester watched the mercury Colum. The first sound of the pulse was heard in the stethoscope the reading in millimeters of mercury at that instant was recorded as the systolic blood pressure. The tester continued to release the pressure slowly until the pulse vanished and the reading was recorded as the diastolic blood pressure in millimeters of mercury (**Pickering and others, 2005**).

Mean Arterial Blood Pressure Calculations

Mean arterial pressure (MAP) is the mean or average, blood pressure in the arterial system. Mean arterial pressure represents the integration or combination, of both the systolic and diastolic blood pressure.

Mean arterial pressure (MAP) = Diastolic blood pressure (DBP)

+ 1/3 (Systolic blood pressure – Diastolic blood pressure)

MAP = DBP + 1/3 (DBP-SBP)

2.2 Analysis of Data

The data obtained were analyzed by analysis of covariance (ANCOVA). Analysis of covariance was computed for any number of experimental groups, the obtained 'F' ratio compared with critical F value for significance. When the F ratio was found to be significant, scheffe's post hoc test was used to find out the paired mean significant difference.

3. RESULTS

Findings: The statistical analysis comparing the initial and final means of mean arterial blood pressure due to aerobic, resistance and concurrent training have been presented in Table I.

TABLE I

COMPUTATION OF ANALYSIS OF COVARIATION ON MEAN ARTERIAL BLOOD PRESSURE

TEST	E.G. I	E.G. II	E.G. III	C.G.	F
PRE TEST	93.93	93.36	93.34	93.47	1.40
POST TEST	91.98	92.39	92.19	93.37	7.70*
ADJUSTED	91.87	92.43	92.24	93.38	8.90*

(The table value required for significance at .05 level with df 3 & 56 is 2.70 and 3 & 55 is 2.72).

Table I shows the analyzed data of mean arterial blood pressure. The mean arterial blood pressure pre means were 93.93 for the aerobic training group, 93.36 for the resistance training group, 93.34 for concurrent training group and 93.47 for the control group. The resultant 'F' ratio of 1.40 was not significant at .05 levels indicating that the three groups were no significant variation. The post test means were 91.98 for the aerobic training group, 92.39 for the resistance training group, 92.19 for concurrent training group and 93.37 for the control group. The resultant 'F' ratio of 7.70 at .05 level indicating that was a significant difference. The difference between the adjusted post-test means of 91.87 for the aerobic training group, 92.43 for the resistance training group, 92.24 for concurrent training group and 93.38 for the control group yield on 'F' ratio 8.90 which was significant at.05 level.

The results of the study indicate that there is a significant difference among aerobic training, resistance training, concurrent training and control groups on the mean arterial blood pressure. To determine which of the paired means had a significant difference, Scheffe's post-hoc test was applied and the results are presented in Table II.

Table II
SCHEFFE'S TEST FOR THE ADJUSTED POST-TEST PAIRED MEANS OF MEAN ARTERIAL BLOOD PRESSURE

Adjusted Post-Test Means				Mean Diff.	Class Interval
AT	RT	CT	CG		
91.87	92.43			0.56	
91.87		92.24		0.37	

91.87			93.38	1.51*	0.86
	92.43	92.24		0.19	
	92.43		93.38	0.95*	
		92.24	93.38	1.14*	

The adjusted post test mean difference of mean arterial blood pressure between aerobic training and control group (1.51), resistance training and control group (0.95), concurrent training and control group (1.14) were greater than the required confidence interval of 0.86. The results of the study indicate that there were significant differences between control group and experimental groups and there was no significant difference between the experimental groups.

4. DISCUSSION/CONCLUSIONS

The results of the study proved that there were significant differences between control group and aerobic training, resistance training and concurrent training group. The eight weeks of experimental treatment significantly influence on resting heart rate content in college students. However, there was no significant difference between experimental groups. The above results are supported by (Patricia and others, 2008, Wahab and Venkatseswarul, 2010).

5. RECOMMENDATIONS

1. It was recommended that adequate steps may be taken to include aerobic, resistance and concurrent training in the physical education curriculum as these exercises significantly improves the mean arterial blood pressure of the subjects.
2. Similar study may be conducted on a larger population.
3. Similar study may be undertaken and its influence on psychological and biochemical parameters may be assessed.

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