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Efficacy of intensive and extensive interval training on anaerobic capacity of physical education students of Annamalai University

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Abstract
The purpose of the study was to analyze the effect of intensive and extensive interval training on anaerobic capacity. To achieve the purpose of the study, forty-five male students studying bachelor's degree in physical education, from the Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu, India were selected as subjects at random. The age, height and weight of the subjects ranged from 19 to 21 years, 160 to 175cms and 50 to 60 kg respectively. The selected subjects were medically examined by a qualified physician and certified that they were medically and physically fit enough to undergo the intensive and extensive interval running programme.
The selected subjects were randomly assigned into three groups of 15 each namely experimental group I, experimental group II and a control group. The experimental group I underwent Intensive Interval Training and experimental group II underwent Extensive Interval Training and group III acted as control, who did not participate in any special training apart from their regular physical education programme of the curriculum. The experimental groups underwent the respective training programme for three days a week for twelve weeks. It is inferred that twelve weeks of intensive interval training and extensive interval training groups have significantly improved the anaerobic power as compared to the control group. The results also reveal that there was no significant differences exist between intensive interval training group and extensive interval training group in improving the anaerobic power.

Keywords: Intensive and extensive interval Training and anaerobic capacity

Introduction

Intensive interval training

The interval training constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are short exertion periods with high load intensity (Competition Specific Endurance or Intensive Strength Endurance) with the duration of the recovery periods being short enough as to not result in full recovery.

Objectives of the study

The purpose of the study was to analyze the effect of intensive and extensive interval training on anaerobic capacity

Methodology

The interval running programmes were scheduled for one session a day. The training schedule was administered for both the experimental groups. During the training period the experimental groups underwent their respective training programme three days per week (alternate days) for twelve weeks in addition to their regular programme of the course of study as per their curriculum. Group I underwent high intensity with low repetition interval running, Group II underwent moderate intensity with high repetition interval running. Prior to every training sessions both the groups had ten to fifteen minutes of warm-up exercise involving jogging, calisthenics and stretching exercises.

Margaria-Kalamen anaerobic power test

Purpose

To quantify the anaerobic capacity of the subjects considered in this study.

Equipment used

A digital timer with switch mats to switch on and off the timer, a firm 15-steps wooden staircase [width 90cms, perpendicular height 250cms, angle 45 degree, perpendicular height between third and ninth step 108cms.

Procedure

Two switch mats connected to an electronic timing device are placed on the third and ninth steps of the staircase. The sensitivity of the mat was 15 kg. The subject from six meters in front of the staircase ran up towards the stairs as rapidly as possible without losing momentum leaps to the third, sixth and ninth step in quick succession. The clock was started as the subjects stepped on the first switch mat [on the third step] and stopped as he stepped on the second [on the ninth step]. Time was recorded to one hundred of the second (Johnson and Nelson, 1986).

Scoring

Three trials were given to each subject and the best was recorded for computing anaerobic power by using the following formula:

$$P = WD / t$$

Where, P = power (kg m/s)
W= weight of the subjects in kilograms.
D = vertical distance between the third and ninth steps.
t = time taken between the third and ninth steps in seconds.

Collection of the Data

Experimental Design and Statistical Procedure

Anaerobic Capacity the data on selected speed were collected by administrating standard test and procedure. Pre test data were collected two days before the training programme and post-test data were collected two days after the training programme. The data collected from the three groups were statistically analyzed by analysis of covariance (ANCOVA). To make adjustment for difference in initial means, the adjusted post means were calculated. Post hoc test was applied to determine which of the paired mean difference was significant, since three groups are involved. In all cases to test the significance 0.05 level of confidence was utilized.

Analysis of the data

The pre and post test data collected from the experimental and control groups on explosive power parameters were statistically analyzed by analysis of covariance (ANCOVA) and the results are presented below.

Anaerobic Power

The pre and post test data on anaerobic power of the intensive interval training, extensive interval training and control groups have been analysed statistically and the results are presented in table-I.

Table 1: Analysis of covariance on anaerobic power of intensive interval training extensive interval training and control groups

	Group I	Group II	Group III	Source of variance	Sum of Squares	df	Mean squares	'F' ratio
Pretest Mean	98.72	99.24	97.31	Between	28.79	2	14.40	1.95
SD	2.63	3.38	2.88	Within	310.38	42	7.39	
Posttest Mean	106.54	109.12	97.56	Between	1099.26	2	549.63	31.11*
SD	2.95	4.26	4.18	Within	742.26	42	17.67	
Adjusted Posttest Mean	106.27	108.42	97.41	Between	756.75	2	378.38	28.91*
				Within	536.69	41	13.09	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for degree of freedom 2 and 41 is 3.23 and degree of freedom 2 and 42 is 3.22.)

The pre test means on anaerobic power of intensive interval training, extensive interval training groups and control group are 98.72, 99.24 and 97.31 respectively. The obtained 'F' ratio value on the scores of pre test means 1.95 was lesser than the required F ratio value 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. The result of the study reveals that there was no significant differences existed between the experimental and control groups during the pre test period.

The post test means on anaerobic power of intensive interval training, extensive interval training groups and control group are 106.54, 109.18 and 97.56 respectively. The obtained post test 'F' ratio value of 31.11 was greater than the required table value of 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It reveals that significant differences existed between the groups after twelve weeks of training.

The adjusted post test means on anaerobic power of intensive interval training, extensive interval training groups and control group are 106.27, 108.42 and 97.41 respectively. The obtained 'F' ratio value 28.91 was greater than the required table value of 3.23 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted post test mean of the intensive interval training, extensive interval training and control groups in improving the anaerobic power.

Since the adjusted post test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table- II.

Table 2: Scheffe's test for the adjusted post test paired means differences on anaerobic power

Adjusted post test Means				Confidence Interval
Intensive Interval Training Group	Extensive Interval Training Group	Control Group	Mean Difference	
106.27	108.42		2.15	3.36
106.27		97.41	8.86*	3.36
	108.42	97.41	11.01*	3.36

*Significant at .05 level of confidence

Table–II indicates that the adjusted post test mean difference on anaerobic power between intensive interval training and extensive interval training groups, intensive interval training and control groups, extensive interval training and control groups are 2.15, 8.86 and 11.01 respectively, which are higher than the confidence interval value of 3.36 at 0.05 level of confidence.

Result

It is inferred that twelve weeks of intensive interval training and extensive interval training groups have significantly improved the anaerobic power as compared to the control

group. The results also reveal that there was no significant differences exist between intensive interval training group and extensive interval training group in improving the anaerobic power.

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