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EFFECT OF VARIED RESISTANCE CIRCUIT WEIGHT TRAINING ON VO_2 MAX

Physical Education

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ABSTRACT

The purpose of the study was to analyze the effect of varied resistance circuit weight training on VO_2 max. To achieve the purpose of the study, sixty male students studying physical education course at Sivanthi Adithanar college of Physical Education, Thiruchendur, Tamilnadu, India were selected as subjects. The age, height and weight of the subjects ranged from 21 to 27 years, 154 to 174 centimetres and 50 to 71 kilograms respectively. The selected subjects were randomly assigned into four equal groups of fifteen each (n=15) at random. Group-I underwent high intensity circuit weight training, group-II underwent medium intensity circuit weight training, group-III underwent low intensity circuit weight training and group- IV acted as control. The data collected from the four groups prior to and post experimentation were statistically analyzed by analysis of covariance (ANCOVA). Since four groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. The experimental groups had significant improvement on VO_2 max when comparing to the control group.

KEYWORDS:

High, Medium and Low Intensity weight training and VO_2 max.

INTRODUCTION

Training denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. Means and measure from several sports scheme disciplines significantly support the training of an advanced sports person. Trainings have been explained as a programmed of exercise designed to improve the skills and increase the energy capacities of an athlete's for particular event (Edward, 1984).

High intensity training is a form of strength training popularized in the 1970s by Arthur Jones, the founder of Nautilus. The training focuses on performing quality weight training repetitions to the point of momentary muscular failure. The training takes into account the number of repetitions, the amount of weight, and the amount of time the muscle is exposed to tension in order to maximize the amount of muscle fibres recruitment (Philbin, 2004).

Weight training also provides functional benefits. Stronger muscles improve posture, provide better support for joints, and reduce the risk of injury from everyday activities. Older people who take up weight training can prevent some of the loss of muscle tissue that normally accompanies aging and even regain some functional strength and by doing so become less frail. They may be able to avoid some types of physical disability. Weight-bearing exercise also helps to prevent osteoporosis.

Strength training helps to maintain good flexibility. The ability of the body to resist the stresses that can result from an injury can be increased by obtaining a greater amount of strength. That is true in the athletic world and it has its advantages in performing everyday activities, such as lifting or carrying objects. Strength contributes to the overall efficiency of the human body. Starting a strength training program means you have started a new lifestyle because strength is reversible. It will decline if person do not continue to obtain a strength stimulus throughout their entire life (Philip, 2009).

METHODOLOGY

The purpose of the study was to analyze the effect of varied resistance circuit weight training on VO_2 max. To achieve the purpose of the study, sixty male students studying physical education course at Sivanthi Adithanar college of Physical Education, Thiruchendur, Tamilnadu, India were selected as subjects. The age, height and weight of the subjects ranged from 21 to 27 years, 154 to 174 centimetres and 50 to 71 kilograms respectively. The selected subjects were randomly assigned into four equal groups of fifteen each (n=15) at random. Group-I underwent high intensity circuit weight training the intensity of the training increased progressively once in two weeks, from four set of 8repetitions @ 70% 1-RM in first week to two sets of 3 repetitions @ 95% 1-RM in 12 weeks with eight exercise. Group-II underwent medium intensity circuit weight training. The intensity of the training increased progressively once in two weeks, from six set of 12 repetitions @ 45% 1-RM in first week to three sets of 6 repetitions @ 70% 1-RM in 12 weeks with eight exercises.

Group-III underwent low intensity circuit weight training. The intensity of the training increased progressively once in two weeks, from eight set of 18 repetitions @ 20% 1-RM in first week to four sets of 14 repetitions @ 45% 1-RM in 12 weeks with eight exercises. The VO_2 max was measured the one mile run/walk test. Group- IV acted as control. The data collected from the four groups prior to and post experimentation were statistically analyzed by analysis of covariance (ANCOVA). Since four groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences the level of significant fixed at 0.05.

RESULTS

Table - I

ANALYSIS OF COVARIANCE ON VO_2 MAX OF EXPERIMENTAL AND CONTROL GROUPS

	High intensity Circuit weight training	Medium intensity Circuit weight training	Low intensity Circuit weight training	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean SD	44.40	42.67	43.13	40.93	B	92.58	3	30.86	1.59
	4.21	4.39	4.66	4.35	W	1085.60	56	19.39	
Post test Mean SD	54.47	50.33	49.01	42.02	B	1209.78	3	403.26	16.45*
	5.52	4.89	5.03	4.29	W	1373.07	56	24.52	
Adjusted Post test Mean	52.72	49.68	46.10	43.01	B	573.57	3	191.19	11.63*
					W	903.76	55	16.43	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 3 and 55 is 2.77 and degree of freedom 3 and 56 is 2.77)

*Significant at .05 level of confidence

The adjusted post test means on VO_2 Max of high intensity circuit weight training, medium intensity circuit weight training, low intensity circuit weight training and control groups are 52.72, 49.68, 46.10 and 43.01 respectively. The obtained 'F' ratio value of 11.63 on VO_2 Max were greater than the required table value of 2.77 for the degrees of freedom 3 and 55 at 0.05 level of confidence. It is observed from this finding that significant differences exist among the adjusted

post test means of experimental and control groups on VO_2 Max.

Since, the adjusted post test 'F' ratio value is found to be significant the Scheffe's test is applied as post hoc test to determine the paired mean differences, and it is presented in table-II.

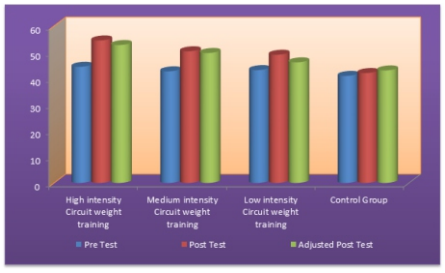
Table-II
SCHEFFE'S TEST FOR THE DIFFERENCE BETWEEN THE ADJUSTED POST TEST PAIRED MEANS OF VO_2 MAX

Adjusted Post Test Means				DM	CI
High intensity circuit weight training	Medium intensity circuit weight training	Low intensity circuit weight training	Control Group		
52.72	49.68			3.04*	3.01
52.72		46.10		6.62*	3.01
52.72			43.01	9.71*	3.01
	49.68	46.10		3.58*	3.01
	49.68		43.01	6.67*	3.01
		46.10	43.01	3.09*	3.01

*significant

Table-II shows the Scheffe's test results that there is a significant difference between the adjusted post test means of high intensity and medium intensity circuit weight training groups; high intensity and low intensity circuit weight training groups; high intensity circuit weight training and control groups; medium intensity and low intensity circuit weight training groups; medium intensity circuit weight training and control groups; low intensity circuit weight training and control groups on VO2 Max.

Figure – I
CYLINDER DIAGRAM SHOWING THE MEAN VALUE ON VO_2 Max OF EXPERIMENTAL AND CONTROL GROUPS



Discussion and Conclusion

The present result of the study confirmed that all the three experimental groups had significant increase on VO_2 Max when comparing to the control group, due to twelve weeks of varied resistance circuit weight training. And also there are significant differences among high, medium and low intensity circuit weight training groups. However the high intensity circuit weight training was better than the other two experimental groups to increase the VO_2 Max.

The following studies results are supported with the present study findings. Takeshima et al., (2004) investigated cardiovascular adaptations to circuit weight training have shown increases from 15% to 18.6% in VO_2max. Brentano et al., (2008) developed a circuit-based exercises program in postmenopausal women which produced significant improvements in Vo_2max.

References

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