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Physical Education

EFFECT OF VARIED RESISTANCE CIRCUIT WEIGHT TRAINING ON BODY MASS INDEX

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ABSTRACT The purpose of the study was to analyze the effect of varied resistance circuit weight training on body mass index. 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 decrease on body mass index when comparing to the control group.

KEYWORDS : High, Medium and Low Intensity weight training and Body Mass Index.

INTRODUCTION

Sports training are the basic form of an athlete's training. It is the preparation systematically organized with the help of exercises which in fact is a pedagogically organized process of controlling the development of an athlete (Howard and Rosemary,1981). High sports performance through sports training can be achieved by a scientific and systematic use of training means. Training means are various physical exercises and other objects, methods and procedure which are used for the improvement maintenance and recovery of performance capacity and performance readiness (Singh,1991).

Resistance training is a form of strength training in which each effort is performed against a specific opposing force generated by resistance. Resistance exercise is used to develop the strength and size of skeletal muscles. Properly performed resistance training can provide significant functional benefits and improvement in overall health and well-being. Resistance training has been generally categorized into two major types with different objectives: "strength-type" and "hypertrophy- type". The former consists of high-intensity exercises (above 90 % of 1 repetition maximum -RM) with low repetitions and long rest periods between sets. This type of regimen is used for gaining strength. On the other hand, the "hypertrophy type" regimen consists of moderate-intensity exercises (60 to 75% of 1RM) with higher repetitions and shorter rest periods between sets. This type of regimen has been thought to be effective in gaining muscle size (Kraemer, et al., 1995).

METHODOLOGY

The purpose of the study was to analyze the effect of varied resistance circuit weight training on body mass index. 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. Group- IV acted as control.

The body mass index was measured the body weight / height^2 test. 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 BODY MASS INDEX 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	23.78	23.57	24.34	24.68	B	11.54	33	3.84	0.76
	2.30	2.01	2.11	2.49	W	281.06	556	5.02	
Post test Mean SD	19.80	21.87	22.73	24.77	B	191.05	33	63.68	11.16*
	2.24	1.97	2.12	3.05	W	319.57	556	5.71	
Adjusted Post test Mean	19.84	21.95	22.69	24.68	B	175.32	3	58.44	10.26*
					W	313.26	55	5.69	

(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 body mass index of high intensity circuit weight training, medium intensity circuit weight training, low intensity circuit weight training and control groups are 19.84, 21.95, 22.69 and 24.68 respectively. The obtained 'F' ratio value of 10.26 on body mass index 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 body mass index.

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

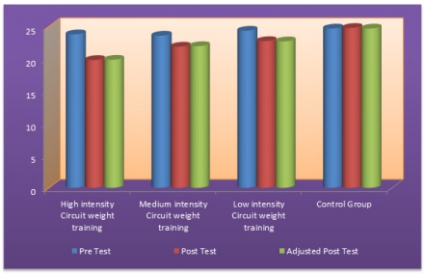
ADJUSTED POST TEST PAIRED MEANS OF BODY MASS INDEX

Adjusted Post Test Means				DM	CI
High intensity circuit weight training	Medium intensity circuit weight training	Low intensity circuit weight training	Control Group		
19.84	21.95			2.11*	1.77
19.84		22.69		2.85*	1.77
19.84			24.68	4.84*	1.77
	21.95	22.69		0.74	1.77
	21.95		24.68	2.73*	1.77
		22.69	24.68	1.99*	1.77

*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 circuit weight training and control groups; low intensity circuit weight training and control groups on body mass index. Also the result of the study reveals that there is no significant difference between the medium intensity and low intensity circuit weight training groups on body mass index.

Figure – I
CYLINDER DIAGRAM SHOWING THE MEAN VALUE ON BODY MASS INDEX OF EXPERIMENTAL AND CONTROL GROUPS



Discussion and Conclusion

The present result of the study affirmed that all the three experimental groups had significant decrease on body mass index when comparing to the control group, due to twelve weeks of varied resistance circuit weight training. And also there is significant difference between medium and low intensity circuit weight training groups. However the high intensity circuit weight training was better than the other two experimental groups to decrease the body mass index.

The following studies results are supported with the present study findings. Davis and others (2008) found decline in fat mass and percent body fat of concurrent training group. Hass and others (2001) documented that concurrent training, resulted in significant reductions in fat mass and percentage body fat. The combined training group showed a significant decrease in percent body fat and increase in lean body mass from pre- to post-training (165 to 170.2 lb). The concurrent training resulted in a significant decrease in percent body fat is in accordance with several other studies (Leveritt, 1999). The above mentioned results are strengthening the result of my present study. Combined strength and endurance training was better decrease on body mass index when comparing to the isolated training.

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