EFFECT OF DIFFERENT INTENSITIES OF INTERVAL TRAINING ON STRENGTH ENDURANCE

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ABSTRACT

The purpose of this study was to find out the effect of different intensities of interval training on strength endurance. Sixty male students from Scott Christian College, Nagercoil were randomly selected as subjects for the purpose of the study. Their ages, as obtained from the collage records, ranged from 18 to 20 years. A pilot study was also conducted with fifteen subjects randomly chosen from the collage. The present study consists of four groups (pertaining to this particular study). The first group underwent high intensity interval training programme, the second group underwent medium intensity interval training programme the third group underwent low intensity interval training programme and the fourth group acted as control and did not undergo any systematic training programme. The effect of training was assessed on strength variable, namely strength endurance. They were assessed by sit ups respectively. The subjects were tested on criterion variable after the completion of 12 weeks training programme. To nullify the variation in the pre-test means, analysis of covariance (ANCOVA) was applied and the adjusted post-test means were tested for significance. If the 'F' ratio was significant Scheffe's post-hoc test was applied to find out the significant differences if any, among the paired means. The level of significance was set at 0.05 level.

Key Words: Interval Training, Strength Endurance.

INTRODUCTION

Physical training is a process consisting of a series of physiological stresses that bring about or preserve specific adaptations to enhance a subject's ability to tolerate the stressing factors arising from training (Coyle, 1988; Gollnick et al,, 1984; Houston, 1986; Tidow, 1995). Despite the fact that physical training may improve sports performance, increased amounts in either training volume or intensity may excessively overload the physiological mechanisms of adaptation. As a result, competitors may report a feeling of constant fatigue (Eichner,1989), which will lead to an inability to perform well during both training and competitions, an inability to recover optimally following competition, a loss in competitive desire, and a loss in enthusiasm for training (Wilmore and Costill,1988). Therefore, training-induced skeletal muscle adaptations are such that the trained muscle increases its tolerance to exercise (Houston, 1986). On the other hand, inherent to the concept of training adaptation is the principle of training according to which the stoppage or marked reduction of training leads to a partial or complete reversal of training-induced adaptations, thus compromising athletic performance (Coyle, 1988; Hawley and Burke, 1998; Mujika and Padilla, 2000). Skeletal muscle tissue is no exception to this rule and also readjusts to the reduced physiological stressors during periods of reduced training stimuli or complete training cessation (Costill, 1988; Coyle, 1988; Coyle, 1990; Fleck, 1994; Hawley, 1987; Houston, 1986; Wilber and Moffatt, 1994). Skeletal muscle tissue has a plasticity that allows it to adapt to variable levels of functional demands. During periods of marked reduction of physical activity or training cessation, muscular detraining occurs.

METHODOLOGY

The purpose of this study was to find out the effect of different intensities of interval training on selected strength parameters. Sixty male students from Scott Christian College, Nagercoil were randomly selected as subjects for the purpose of the study. Their ages, as obtained from the collage records, ranged from 18 to 20 years. A pilot study was also conducted with fifteen subjects randomly chosen from the collage.The present study consists of four groups (pertaining to this particular study). The first group underwent high intensity interval training programme, the second group underwent medium intensity interval training programme the third group underwent low intensity interval training programme and the fourth group acted as control and did not undergo any systematic training programme. The effect of training was assessed on strength endurance. They were assessed by sit ups. The subjects were tested on criterion variables after the completion of 12 weeks training programme. To nullify the variation in the pre-test means, analysis of covariance (ANCOVA) was applied and the adjusted post-test means were tested for significance. If the 'F' ratio was significant Scheffe's post-hoc test was applied to find out the significant differences if any, among

the paired means. The level of significance was set at 0.05 level.

ANALYSIS OF THE DATA

As far as strength endurance, the data collected among different intensities of interval training, control group of the pre and post-tests have been analysed statistically and presented in table I.

Table-I: Analysis of Covariance on Strength Endurance among Varied Intensity of Interval Training and Control Group

	High intensity group	Medium intensity group	Low intensity group	Control group	SoV	Sum of squares	df	Mean square	'F' ratio
Pre-Test									
Mean	34.67	35.13	34.40	34.73	B:	4.13	3	1.38	0.196
SD	3.02	2.64	2.59	2.31	W:	393.60	56	7.03	
Post-Test									
Mean	39.80	41.40	45.60	35.87	B:	730.00	3	243.33	23.28*
SD	3.45	3.25	3.38	2.83	W:	585.33	56	10.45	
Adjusted Post-Test Mean	39.87	40.99	45.94	35.87	B:	772.78	3	257.59	83.09*
					W:	170.52	55	3.10	

** Significant at 0.05 level of confidence.*

The table value required for significance at 0.05 level with df 3 & 56, and 3 & 55 are 2.776 and 2.78 respectively.

Table I shows that the pre-test mean values of the strength endurance for high intensity group are 34.67, medium intensity group is 35.13, low intensity group is 34.40 and control group is 34.73. There is no significant variation among the four groups on strength endurance since the 'F' ratio obtained is 0.196 only. The post-test mean values of the high intensity group is 39.80 medium intensity group is 41.40, low intensity group is 45.60 and control group is 35.87, which resulted in a 'F' ratio of 23.28 and it is significant 0.05 level.

Table I further shows that the adjusted post-test mean values for the differences in pre-test for high, medium, low intensity interval training groups, and control group are 39.87, 40.99, 45.94 and 35.87 respectively. The 'F' ratio arrived at by the statistical calculation is 83.09 which is significant at 0.05 level. The results show that there is a significant variation among the three groups on strength endurance. To determine which of the paired means had a significant difference, Scheffe's post-test was applied and the results are presented in table II.

Table-II: Scheffe's Test for the Differences between the Adjusted Post-Test Paired Means of Strength Endurance

Adjusted Post-Test Means				Means Differences
High intensity group	**Medium intensity group**	**Low intensity group**	**Control group**	
39.87	40.99			1.12
39.87		45.94		6.07*
39.87			35.87	4.00*
	40.99	45.94		4.95*
	40.99		35.87	5.12*
		45.94	35.87	10.07*

** Significant at 0.05 level.*

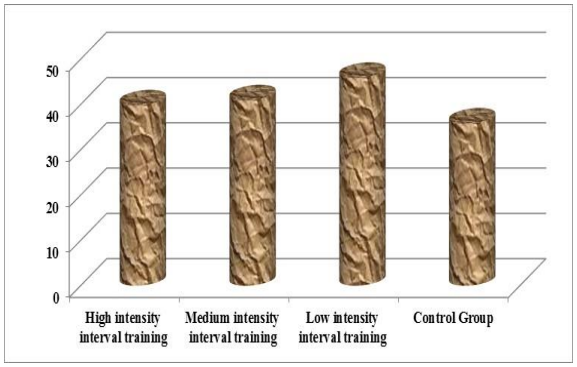
The confidence interval required for significance at 0.05 level is 1.84.

The table-II gives that the adjusted post-test mean differences in strength endurance between high intensity groups and control, medium intensity groups and control, between low intensity groups and control group are 6.07, 4.00, 4.95, 5.12 and 10.07 respectively, which are higher than the confidence interval value of 1.84. It is found that the all intensity interval training groups improved in strength endurance as compared to control group.

The mean difference between high intensity groups and low group is 6.07 and between medium intensity groups and low group is 4.95. It is inferred that

the low intensity group had more improvement in strength endurance than high and medium intensity groups after the training. Between high and medium intensity groups, the mean difference 1.12 is lower than the confidence interval value of 1.84. It may be concluded that no significant difference exists in strength endurance among these two groups.

The Adjusted Post Test Mean on Strength Endurance of Experimental and Control Group are graphically represented in figure I.



DISCUSSION ON FINDINGS

The findings of the study reveal that regular training of different intensities interval training, has resulted in a significant increase on strength endurance of all the intensity (high medium low) groups as compared to control group. It is observed that the improvement in strength endurance is greater for low intensity group than the high and medium intensity groups. Therefore, it is evident that the low intensity training is better than other high and medium intensity training to develop strength endurance in interval training.

CONCLUSIONS

It was concluded that low intensity training was better than high and medium intensity interval training to develop strength endurance.

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