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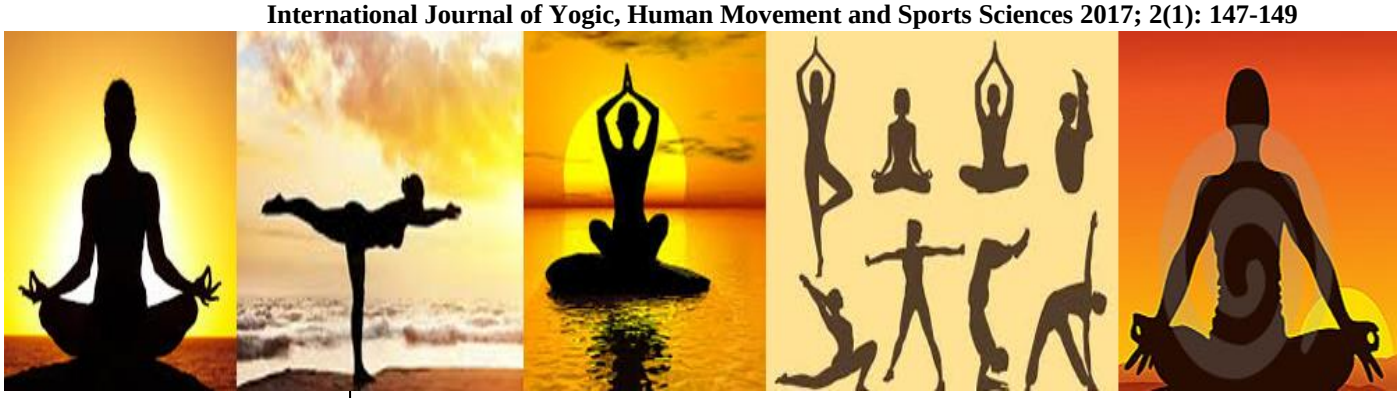

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Effect of different high medium and low intensity training programme on anaerobic power

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Abstract
The purpose of the study was intended to investigate the effect of different intensity resistance training programme on selected power parameter of progressive resistance training with the three different intensity groups on selected power parameter namely Anaerobic power. To achieve the purpose of the study the investigator adapted a series of systematic steps. Sixty subjects were selected randomly. The sixty subjects were randomly assigned into four equal groups comprising fifteen each. The study groups were named based on the intensity of training (pertaining to this particular study), as high intensity group, medium intensity group, low intensity group, and the fourth group acted as control. All the subjects were tested on the above mentioned criterion variable before the commencement of the training programme. Thereafter three different intensities of resistance training were given 3 days a week for 10 weeks for the three experimental groups and the control group did not participate in any systematic programme. The collected data were analyzed statistically by analysis of covariance (ANCOVA) and Scheffe's post-hoc test was used to test the paired mean differences. High, medium and low intensity training groups showed significant improvement in anaerobic power as compared to control group. The medium intensity training programme showed significant increase in anaerobic power as compared to low and high intensity training programmers, low intensity training programme significantly increased the anaerobic power as compared to high intensity group.

Keywords: Different intensity, resistance training, anaerobic power, high medium and low intensity

1. Introduction
Physiological principle on which strength development depends is known as the overload principles. This principle states that strength will increase only where the muscle performs against a greater resistance than existing before. If the resistance training programme lasts for several weeks or months the body gradually adopts it and the training is felt easier. During training there is need for a continuous increase in the stress placed on the muscle, as it becomes capable of producing greater force. There are several prescribed methods for overloading the muscles. In one method the resistance (weight) is increased and in another method the volume (the number of sets and repetitions) are increased Fox and Mathews (1981) [1].

Considering the above fact, it is understood that the effect of training depends upon the intensity, density, duration and frequency of load. Hence an attempt has been made by the investigator to find out the effect of three different intensities of progressive resistance training on selected strength power and biochemical variables.

2. Materials and methods
2.1 statistical technique
The collected data were analyzed statistically by using ANCOVA (analysis of covariance) to find out the effect of different intensity resistance training programme on selected power parameter (anaerobic power). Whenever, the obtained 'F' ratio for the adjusted post-test mean was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

2.2 selection of subjects
Sixty subjects were selected at random. The sixty subjects were randomly assigned into four equal groups comprising fifteen each. The study groups were named based upon the intensity of training (pertaining to this particular study), as high intensity group, medium intensity group, low intensity group, and the fourth group acted as control group.

2.3 selection of variable
In the present study, the investigator selected the Power parameter namely anaerobic power. The selected criterion variable was measured by.

$$\frac{\text{Body weight} \times \text{Vertical distance}}{\text{Time}} \left\{ \text{Margaria-Kalamen Test} \right\}$$

3. Analysis of the data
3.1 Anaerobic power
The data collected during pre and post-tests among different intensity groups such as high, medium, low intensity groups and control group on anaerobic power have been analysed statistically and the results are shown in table I.

Table 1: Analysis of covariance for pre and post-test data on anaerobic power among high medium low intensity groups 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	92.40	92.86	92.66	92.86	B:	2.20	3	0.73	0.21
SD	2.19	1.72	1.63	1.76	W:	190.4	56	3.40	
Post-Test									
Mean	94.80	99.86	97.13	92.73	B:	424.13	3	141.37	28.19*
SD	2.17	2.26	2.55	1.90	W:	280.80	56	5.01	
Adjusted Post-Test									
Mean	94.95	99.79	97.15	92.64	B:	418.16	3	1309.38	32.99*
					W:	23223.32	55	4.22	

* Significant at 0.05 level of confidence.
DF-degrees of freedom, SD-Standard Deviation, SOV-Source of Variance.
B-Between; W-Within.
The table value required for significance at 0.05 level with DF 3 & 56, and 3 & 55 are 2.776 and 2.78 respectively.

It is clear from table I that the pre-test mean scores secured by the high intensity group, medium intensity group, low intensity group and control group are, 92.40, 92.86, 92.66 and 92.86 respectively. The 'F' ratio of 0.21 arrived at by the statistical calculation is less than the table value of 2.776 required for DF 3 and 56 at 0.05 level of significance on anaerobic power. It is inferred that there is statistically no significant variation among different intensity groups and control group before the commencement of training programme.

The post-test mean scores secured by the high intensity group, medium intensity group, low intensity group and control group are, 94.80, 99.86, 97.13 and 92.73 respectively. The 'F' ratio of 28.19 arrived at by the statistical calculation is greater than the table value of 2.776 required for DF 3 and 56 at 0.05 level of significance. It reveals that all the four groups have demonstrated significant variations on anaerobic power at the end of training programme.

The adjusted post-test mean scores secured by the high intensity group, medium intensity group, low intensity group and control group are, 194.95, 99.79, 97.15 and 92.64 respectively. The 'F' ratio of 32.93 arrived at by the statistical calculation is greater than the table value of 2.78 required for DF 3 and 55 at 0.05 level of significance. It is found that significant differences exist among the four groups on anaerobic power after adjusting the initial mean differences on the post-test means.

In order to determine which of the paired means have significant differences, Scheffe's test was computed and it is presented in table II.

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

Adjusted Post-Test Means				Means Differences
High intensity group	**Medium intensity group**	**Low intensity group**	**Control group**	
94.95	99.79			4.84*
94.95		97.15		2.2*
94.95			92.64	2.31*
	99.79	97.15		2.64*
	99.79		92.64	7.15*
		97.15	92.64	4.51*

* Significant at 0.05 level.
The confidence interval required for significance at 0.05 level is 2.13.

The table II shows that the adjusted post-test mean difference of anaerobic power between control group and high intensity group, control group and medium intensity group and between control group and low intensity group are 2.31, 7.15 and 4.51 respectively which are higher than the confidence interval value of 2.13 at 0.05 level of significance. It is inferred that the ten weeks of different intensities of resistance training have significantly increased the anaerobic power in three experimental groups as compared to the control group.

The mean difference between high intensity group and medium intensity group is 4.84 high intensity group and low intensity group is 2.2 which are more than the confidence interval value 2.13 at 0.05 level of significance. The result reveals that the high intensity group shows significant differences on anaerobic power compared to the medium and low intensity groups.

The mean difference between medium and low intensity groups is 2.46 and it is more than confidence interval value of

2.13 at 0.05 level of significance. The result shows that the medium intensity group shows significant difference on anaerobic power as compared to low intensity group, but the low intensity group shows significantly higher on anaerobic power as compared to control group but less than the other intensity groups. The details of anaerobic power of three different intensity groups and control group are graphically illustrated in figures I.

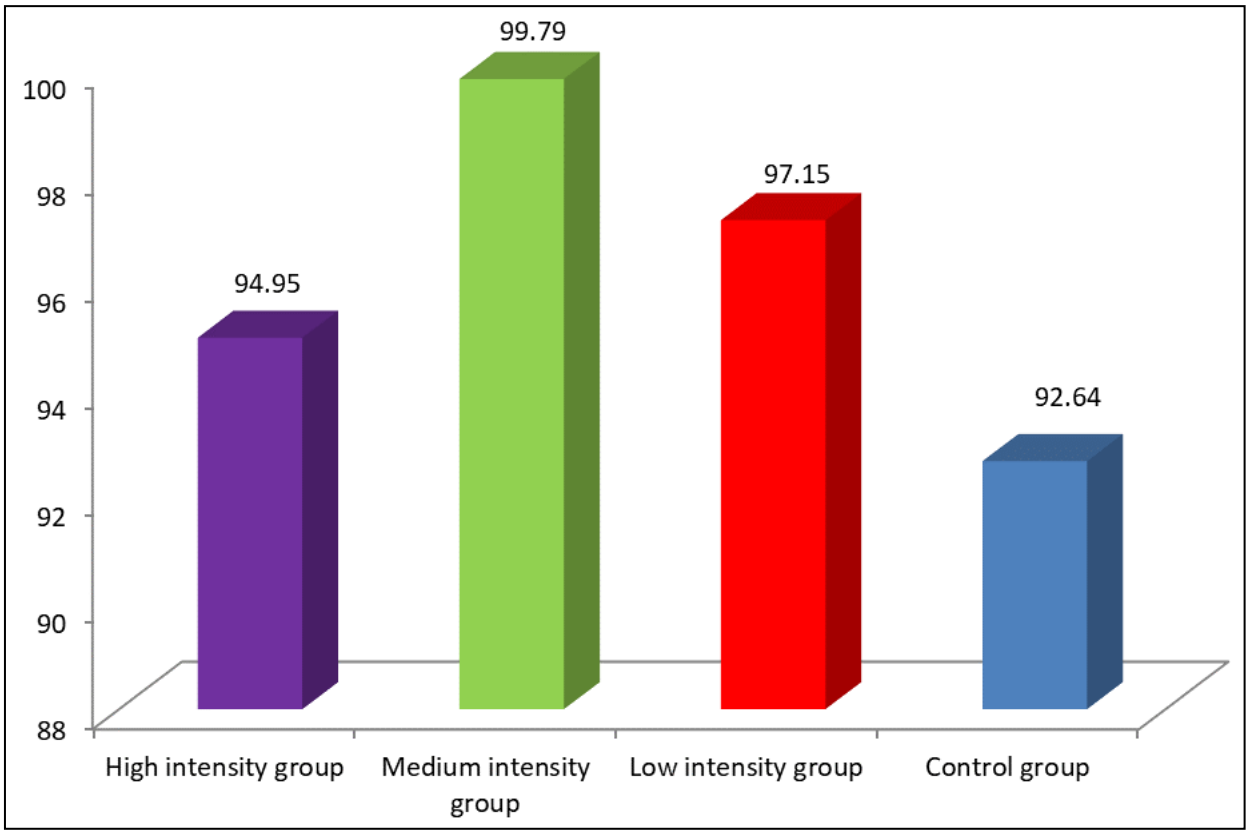

Fig 1: The adjusted post-test mean values of different intensities of resistance training group and control group on anaerobic power

4. Conclusions

Based on the results of the study the following conclusions were drawn:

1. High, medium and low intensity training groups showed significant improvement in anaerobic power as compared to control group.
2. The medium intensity training programme showed significant increase in anaerobic power as compared to low and high intensity training programmes, low intensity training programme significantly increased the anaerobic power as compared to high intensity group.

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