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Effect of low intensity, high intensity and combined weight training on back strength among college male students

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Abstract
The purpose of the study was to find out the effect of low intensity, high intensity and combined weight training on back strength among college male students. To achieve the purpose of the study, sixty male students from S. N. College Cherthala, Kerala, India, were selected as subjects. The age of the subjects ranged from 18 to 24 years. The subjects were divided into four groups of fifteen each (n=15). Group I underwent low intensity weight training, Group II underwent high intensity weight training, Group III underwent combined weight training and Group IV acted as Control. The duration of the training five days per week for twelve weeks. Prior to and after the training period the subjects were tested for, back strength was measured by using dynamometer. The statistical tool were used for the present study is paired t test, ANCOVA and Scheffe's Post-Hoc test. The result of the study was a significant increase on back strength after twelve weeks of low, high intensity weight training and combined weight training programme. However the increase was favour of experimental groups. There was a significant difference was occurred between experimental groups and control group after twelve weeks of low, high intensity weight training and combined weight training programme.

Keywords: Low and high intensity weight training, back strength

Introduction

Weight training is lifting a weight or moving through a range of motion while resisting a force. Free weights, machine equipment, or even one's own body weight can be used as a resistive force. This resistance can be produced using dumbbells, other equipment, or even just one's own weight. The use of free weights or machines, which are common, is a feature of many everyday workouts. Dumbbells and barbells are used as weights, and other mechanisms, such as the cable-and-pulley system, are used by the devices. Exercises involving the use of weights, whether in the form of barbells, dumbbells, or weight machines, are referred to as weight lifting. Resistance training include variations of weight training exercises, such as using dumbbells or barbells and also utilizing human anatomy that is very own for working out.

Metabolism is defined as "chemical reactions that consume energy and result in tissue and compound development or breakdown of substances and release of energy" in the Dictionary of Sport and Exercise Sciences.

Strength training may alter metabolism in three different ways: during the workout itself, after the workout when more oxygen is used, and finally when more muscle is added. During a strength training session, energy consumption increases. The majority of anaerobic strength training advises a substantial carbohydrate intake during a training session. Energy expenditure increases over a period of two to fifteen hours after exercise while the body recovers.

Physical Fitness

Physical fitness is a condition of health and well-being that includes the capacity to carry out everyday tasks and jobs as well as take part in sports and games. It is typically attained by correct diet, moderate to strenuous exercise, and adequate rest and recuperation.

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Due to the impacts of World War II and the industrial revolution, the term "fitness" reached the height of its use in 1950. This job is only given to those with a sizable aerobic or anaerobic capacity. A balanced fitness programme increases a person's overall fitness by having them practise only one of the fitness elements, such as weight training or cardio respiratory endurance.

Back Strength is a measure of the strength of the muscles of the lower back, which is important in core stability and for preventing lower back pain.

Statement of the problem
The purpose of the study was to find out the effect of low intensity, high intensity and combined weight training on back strength among college male students.

Methodology
The purpose of the study was to find out the effect of low intensity, high intensity and combined weight training on

back strength among college male students. To achieve the purpose of the study, sixty male students from S. N. College Cherthala, Kerala, India, were selected as subjects. The age of the subjects ranged from 18 to 24 years. The subjects were divided into four groups of fifteen each (n=15). Group I underwent low intensity weight training, Group II underwent high intensity weight training, Group III underwent combined weight training and Group IV acted as Control. The duration of the training five days per week for twelve weeks. Prior to and after the training period the subjects were tested for, back strength was measured by using dynamometer. The statistical tool were used for the present study is paired t test, ANCOVA and Scheffe's Post-Hoc test.

Analysis of data
Table 1 presents pre and post-test means, standard deviations and dependent t- test values on back strength of low intensity weight training, high intensity weight training, combined weight training and control groups.

Table 1: Summary of Means, Standard Deviation and Dependent T- Test Values on back strength of low intensity weight training, high intensity weight training, combined weight training and control groups

Tests	Low intensity weight training group		High intensity weight training group		Combined weight training group		Control group	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre test	19.253	0.118	19.267	0.129	19.254	0.119	19.268	0.127
Post test	19.480	0.101	19.813	0.093	20.294	0.104	19.280	0.120
T-Test	4.74*		4.52*		4.86*		0.75	

*Significant at .05 level. The table value required at .05 level with df 99 is 1.984.

From the table 1 shows that the obtained dependent t-test values between pre-test and post-test means of low intensity weight training, high intensity weight training, combined weight training and control groups are 4.74, 4.52, 4.86 and 0.75 respectively. The table value required for significant difference with df 99 at .05 level is 1.984. Since, the obtained t-test value of low intensity weight training, high intensity weight training and combined weight training groups is greater than the table value, it is understood that low intensity

weight training, high intensity weight training and combined weight training groups had significantly improved the performance of back strength and the control group has not improved as the obtained t-test value is lesser than the table value because they were not subjected to any specific training. The analysis of covariance on back strength of low intensity weight training, high intensity weight training, combined weight training and control groups have been analyzed and presented in table 2.

Table 2: Analysis of covariance on back strength of low intensity weight training, high intensity weight training, combined weight training and control groups

Adjusted post-test mean				Source of variance	Sum of squares	Df	Mean square	F-ratio
Low intensity weight training group	High intensity weight training group	Combined weight training group	Control group	Between	8.905	3	2.968	44.638*
19.483	19.810	20.297	19.277	Within	0.474	395	0.19	

*Significant at .05 level of confidence. The table value required at 0.05 level with df 3 & 395 is 2.60.

Table 2 shows that the adjusted post-test means of low intensity weight training, high intensity weight training, combined weight training and control groups 19.483, 19.810, 20.297 and 19.277 respectively. The obtained f-ratio value is 44.638 which is higher than the table value 2.60 with df 3 and 395 required for significance at .05 level. Since, the value of f- ratio is higher than the table value it indicates that there is

significant difference exists between the adjusted post-test means of low intensity weight training, high intensity weight training, combined weight training and control groups on back strength. To find out which of the paired means had a significant difference, the scheffes post- hoc test was applied and the results are presented in tables 3.

Table 3: Scheffe's test for the differences between the adjusted post-tests Paired means on back strength

Adjusted post-test mean					
Low intensity weight training group	High intensity weight training group	Combined weight training group	Control group	Mean difference	Confidence interval at 0.05 level
19.483	19.810	---	---	0.327*	
19.483	---	20.297	---	0.814*	
19.483	---	---	19.277	0.206*	
---	19.810	20.297	---	0.487*	0.012
---	19.810	---	19.277	0.533*	
---	---	20.297	19.277	1.02*	

*Significant at 0.05 level of confidence

The above table 3 shows that the adjusted post-test means differences on back strength between low intensity weight training and high intensity weight training is 0.327, low intensity weight training and combined weight training is 0.814, low intensity weight training and control group is 0.206, high intensity weight training and combined weight training is 0.487, high intensity weight training and control group is 0.533 and combined weight training and control group is 1.02 which are greater than the confidence interval value 0.012, which shows significant difference at 0.05 level of confidence. It may be concluded from the results of the study that there was a significant difference on back strength between and within the experimental and control groups.

It was concluded that combined weight training programme is better than low intensity weight training, high intensity weight training, and control groups in improving back strength. It was also reveals that high intensity weight training programme is better than low intensity weight training and control groups for enhancing back strength. Additionally low intensity weight training programme is better than control groups in improving back strength.

Figure I: illustrates the pre, post and adjusted post-test means of low intensity weight training, high intensity weight training, combined weight training and control groups on back strength.
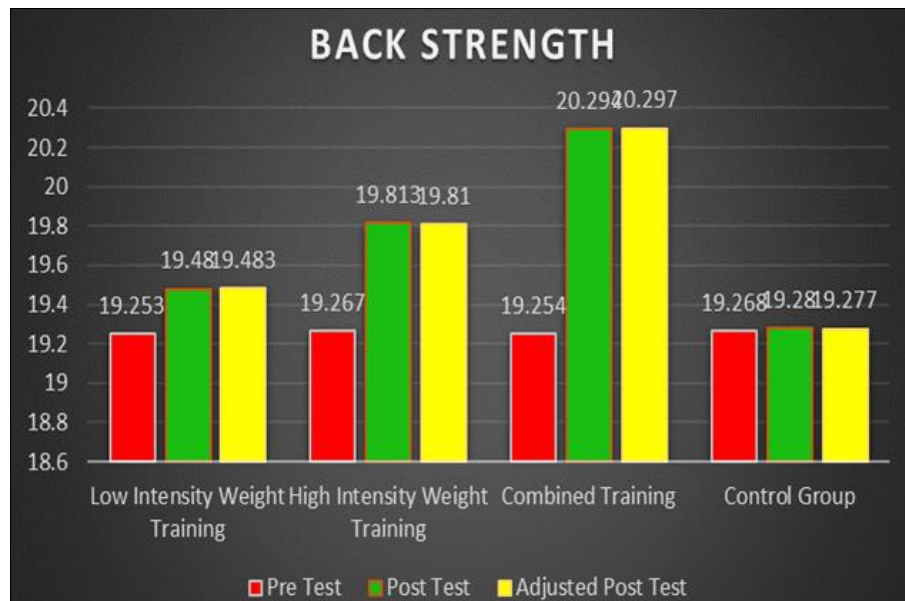

Fig 1: Pre, post and adjusted post-tests mean values of low intensity weight training, high intensity weight training, combined weight training and control groups on back strength

Results
It was concluded that combined weight training programme is better than low intensity weight training, high intensity weight training, and control groups in improving leg strength.
It was also reveals that high intensity weight training programme is better than low intensity weight training and control groups for enhancing leg strength.
Additionally low intensity weight training programme is better than control groups in improving leg strength.

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