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## Combined and isolated effect of low and high intensity weight training on leg strength among college male students

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### Abstract

The purpose of the study was to find out the combined and isolated effect of low and high intensity weight training on leg 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, leg 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 leg 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 combined and isolated effect of low and high intensity weight training programme.

**Keywords:** Low and high intensity weight training, leg strength

### Introduction

Weightlifting or doing a range of motion exercises while resisting a force is known as weight training. One can utilise their own body weight, machine tools, or even free weights as a resistive force. One can create this resistance by employing dumbbells, other tools, or even simply their own body weight. A typical component of many routine exercises is the usage of free weights or machines. Weights like dumbbells and barbells are employed, and the machines also use additional systems like the cable-and-pulley system. Weight lifting is any exercise that uses weights, whether they be in the form of barbells, dumbbells, or weight machines.

Resistance training includes several weight training routines that use the human body's natural muscles as well as equipment like dumbbells or barbells.

The Dictionary of Sport and Exercise Sciences defines metabolism as "chemical processes that use energy and result in tissue and compound formation or breakdown of substances and release of energy."

Three separate times throughout and after a strength training session-when more oxygen is used-and when more muscle is added-can all affect metabolism. An energy-intensive strength-training session results in increased energy use. The majority of anaerobic strength training programmes recommend consuming a lot of carbohydrates throughout a workout. After exercise, energy expenditure increases for two to fifteen hours when the body.

### Physical Fitness

Physical fitness is a state of health and wellbeing that includes the ability to engage in sports and games as well as perform daily activities and jobs. Correct nutrition, moderate to vigorous activity, and enough rest and recovery time are usually required to achieve it. The term "fitness" reached its peak of usage in 1950 as a result of the effects of World War II and the industrial revolution. Only individuals with a significant aerobic or anaerobic ability are allowed

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to work here. Only one of the fitness components, such as weight training or cardio respiratory endurance, is practised as part of a balanced fitness programme, which results in an increase in an individual's total fitness.

Lower body strength is the ability of the body to exert a maximum force against an object external to the body in one maximum effort of the lower body muscles. The muscles that make up the lower body are the large, strong muscles that allow us to get around.

**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 combined and isolated effect of low and high intensity weight training on leg

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, leg 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 leg 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 leg 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  | 25.296                              | 0.211 | 25.352                               | 0.196 | 25.295                         | 0.202 | 25.352        | 0.196 |
| Post test | 25.883                              | 0.208 | 26.267                               | 0.154 | 27.160                         | 0.172 | 25.283        | 0.158 |
| T-Test    | 4.62*                               |       | 3.96*                                |       | 4.66*                          |       | 0.12          |       |

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

From the table - I 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 4.62, 3.96, 4.66 and 0.12 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 leg 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 leg 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 leg 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 |                    |                |     |             |         |
| 25.891                              | 26.259                               | 27.168                         | 25.275        | Between            | 28.027         | 3   | 9.342       | 87.447* |
|                                     |                                      |                                |               | Within             | 2.741          | 395 | 0.050       |         |

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

Table - II shows that the adjusted post-test means of low intensity weight training, high intensity weight training, combined weight training and control groups are 25.891, 26.259, 27.168 and 25.275 respectively. The obtained f-ratio value is 87.447 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 leg 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 leg 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 |
| 25.891                              | 26.259                               | ---                            | ---           | 0.368*          | 0.0062                            |
| 25.891                              | ---                                  | 27.168                         | ---           | 1.277*          |                                   |
| 25.891                              | ---                                  | ---                            | 25.275        | 0.616*          |                                   |
| ---                                 | 26.259                               | 27.168                         | ---           | 0.909*          |                                   |
| ---                                 | 26.259                               | ---                            | 25.275        | 0.984*          |                                   |
| ---                                 | ---                                  | 27.168                         | 25.275        | 1.893*          |                                   |

\*Significant at 0.05 level of confidence

The above table 3 shows that the adjusted post-test means differences on leg strength between low intensity weight training and high intensity weight training is 0.368, low intensity weight training and combined weight training is 1.277, low intensity weight training and control group is 0.616, high intensity weight training and combined weight training is 0.909, high intensity weight training and control group is 0.984 and combined weight training and control group is 1.893 which are greater than the confidence interval value 0.0062, 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 leg 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 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.

Fig 1: 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 leg 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 leg 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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