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# Efficacy of intensive and extensive interval training on leg strength of physical education students of Annamalai University

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**Abstract**
The purpose of the study was to analyze the effect of intensive and extensive interval training on leg strength. To achieve the purpose of the study, forty-five male students studying bachelor's degree in physical education, from the Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu, India were selected as subjects at random. The age, height and weight of the subjects ranged from 19 to 21 years, 160 to 175cms and 50 to 60 kg respectively. The selected subjects were medically examined by a qualified physician and certified that they were medically and physically fit enough to undergo the intensive and extensive interval running programme.
The selected subjects were randomly assigned into three groups of 15 each namely experimental group I, experimental group II and a control group. The experimental group I underwent Intensive Interval Training and experimental group II underwent Extensive Interval Training and group III acted as control, who did not participate in any special training apart from their regular physical education programme of the curriculum. The experimental groups underwent the respective training programme for three days a week for twelve weeks. It is inferred that twelve weeks of intensive interval training and extensive interval training have significantly improved the leg strength as compared to the control group. The results also reveal that the increase in leg strength is significantly more for intensive interval training group than the extensive interval training group.

**Keywords:** intensive and extensive interval training and leg strength

## Introduction

### Intensive interval training

The interval training constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are short exertion periods with high load intensity (Competition Specific Endurance or Intensive Strength Endurance) with the duration of the recovery periods being short enough as to not result in full recovery.

### Objectives of the Study

The purpose of the study was to analyze the effect of intensive and extensive interval training on Leg Strength.

### Methodology

The interval running programmes were scheduled for one session a day. The training schedule was administered for both the experimental groups. During the training period the experimental groups underwent their respective training programme three days per week (alternate days) for twelve weeks in addition to their regular programme of the course of study as per their curriculum. Group I underwent high intensity with low repetition interval running, Group II underwent moderate intensity with high repetition interval running. Prior to every training sessions both the groups had ten to fifteen minutes of warm-up exercise involving jogging, calisthenics and stretching exercises.

### Leg strength (Leg Lift with Dynamometer)

**Purpose**
To assess the leg strength.

**Equipment**
Leg dynamometer.

**Procedure**
The subject stood on the dynamometer base with feet placed parallel and body weight equally balanced on both feet. A belt was wrapped around the subject's hip to stabilize the bar, as the lifting force of the legs was too great to be held by the hands. The subjects held the center of the bar, palms down at the level of the pubic bone. The tester attached the belt lopo to the left end of the bar. The belt was then brought around the lower portion of the sacrum to be attached to the right end of handle. The knees were flexed, heads up and back straight. The handle was hooked on to the chain so that the subject knees were flexed between 115 and 125 degrees. The bar was on the subjects high during the life and hands either in the middle or at the end of the bar. The subjects were directed to lift the knee-joint almost completely to ensure maximum effort.

**Scoring**
As instructed in the Back and Leg Dynamometer Manual, the score shown in the dial during the maximal lift was multiplied

Into two to arrive at the final score. The best of the three trials was recorded in kilograms.

**Collection of the Data**

**Experimental Design and Statistical Procedure**

The selected subjects were randomly assigned into three groups of 15 each namely experimental group I, experimental group II and a control group. The experimental group I underwent Intensive Interval Training and experimental group II underwent Extensive Interval Training and group III acted as control, who did not participate in any special training apart from their regular physical education programme of the curriculum.

The data on selected speed were collected by administrating standard test and procedure. Pretest data were collected two days before the training programme and post-test data were collected two days after the training programme. The data collected from the three groups were statistically analyzed by analysis of covariance (ANCOVA). To make adjustment for difference in initial means, the adjusted post means were calculated. Post hoc test was applied to determine which of the paired mean difference was significant, since three groups are involved. In all cases to test the significance 0.05 level of confidence was utilized.

**Analysis of the data**

The pre and post test data collected from the experimental and control groups on explosive power parameters were statistically analyzed by analysis of covariance (ANCOVA) and the results are presented below.

**Leg strength**

The pre and post test data on leg strength of the intensive interval training, extensive interval training and control groups have been analysed statistically and the results are presented in table-I.

**Table 1:** Analysis of covariance on leg strength of intensive interval training extensive interval training and control groups

| | Group I | Group II | Group III | Source of variance | Sum of Squares | df | Mean squares | 'F' ratio |
|---|---|---|---|---|---|---|---|---|
| Pretest Mean SD | 102.86 | 97.8 | 100.86 | Between | 195.37 | 2 | 97.68 | 2.35 |
| | 5.75 | 5.79 | 7.59 | Within | 1741.86 | 42 | 41.47 | |
| Posttest Mean SD | 107.13 | 99.13 | 100.06 | Between | 574.04 | 2 | 287.02 | 8.02* |
| | 5.22 | 5.09 | 7.43 | Within | 1502.4 | 42 | 35.77 | |
| Adjusted Posttest Mean | 105.02 | 101.57 | 99.68 | Between | 213.25 | 2 | 106.62 | 38.36* |
| | | | | Within | 113.97 | 41 | 2.78 | |

* Significant at. 05 level of confidence.

(The table values required for significance at. 05 level of confidence for degree of freedom 2 and 41 is 3.23 and degree of freedom 2 and 42 is 3.22.)

The pretest means on leg strength of intensive interval training, extensive interval training groups and control group are 102.86, 97.8 and 100.86 respectively. The obtained 'F' ratio value on the scores of pretest means 2.35 was lesser than the required F ratio value 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. The result of the study reveals that there was no significant differences existed between the experimental and control groups during the pretest period.

The posttest means on leg strength of intensive interval training, extensive interval training groups and control group are 107.13, 99.13 and 100.06 respectively. The obtained posttest 'F' ratio value of 8.02 was greater than the required table value of 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It reveals that significant differences existed between the groups after twelve weeks of training.

The adjusted posttest means on leg strength of intensive interval training, extensive interval training groups and control group are 105.02, 101.57 and 99.68 respectively. The obtained 'F' ratio value 38.36 was greater than the required table value of 3.23 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted posttest mean of the intensive interval training, extensive interval training and control groups in improving the leg strength.

Since the adjusted posttest mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table- II.

**Table 2:** Scheffe's test for the adjusted posttest paired means differences on leg strength

| adjusted posttest MEANS | | | | Confidence Interval |
|---|---|---|---|---|
| Intensive Interval Training Group | Extensive Interval Training Group | Control Group | Mean Difference | |
| 105.02 | 101.57 | | 3.45* | 1.42 |
| 105.02 | | 99.68 | 5.34* | 1.42 |
| | 101.57 | 99.68 | 1.89* | 1.42 |

*Significant at. 05 level of confidence

Table–II indicates that the adjusted posttest mean difference on leg strength between intensive interval training and extensive interval training groups, intensive interval training and control groups, extensive interval training and control groups are 3.45, 5.34 and 1.89 respectively, which are higher than the confidence interval value of 0.53 at 0.05 level of confidence.

**Result**

It is inferred that twelve weeks of intensive interval training

and extensive interval training have significantly improved the leg strength as compared to the control group. The results also reveal that the increase in leg strength is significantly more for intensive interval training group than the extensive interval training group.

**Reverences**


1. Clarke, Harrison H, David H. Clarke. Advanced Statistics with Application to Physical Education, Englewood Cliffs, New Jersey: Prentice Hall, 1972.
2. Crowwell L. Biomedical Instruments and measurement, NewDelhi: Prentic Hall of India Pvt Ltd, 1996.
3. Christopher Westgarth-Taylor á John A. Hawley Scott Rickard á Kathryn H. Myburgh á Timothy D. Noakes Steven C. Dennis.
4. Metabolic and performance adaptations to interval training in endurance-trained cyclists.
5. Effects of Endurance and Resistance Training on Total Daily Energy Expenditure in Young Women: A Controlled Randomized Trial.
6. Eric T, Poehlman, Walter F, Denino, Travis Beckett, Kristen A, Kinaman, Isabelle J. Dionne, Roman Dvorak and Philip A. Ades. Sci Med Sport J. 2006-2007; 10(1):27-35.
7. Manipulating high-intensity interval training: effects on VO2max, the lactate threshold and 3000 m running performance in moderately trained males. Esfarjani F, Laursen PB.
8. Chidambara Raja S. Comparative Analysis of the Effects of Continuous and interval Running on Cardio-respiratory Endurance, Unpublished M.Phil., Dissertation, Annamalai University, 1992.
9. Taylor EB, *et al*. The Effect of Work and Rest Distribution on Lactate Production during Interval Training, Medicine and Science in Sport and Exercise. 2003; 34(5):274.
10. Gaessar GA, Wilson LA. Effect of Continuous and Interval Training on the Parameters of the Power-Endurance Time Relationship of High-Intensity Exercise, International Journal of Sports Medicine. 1988; 9(6):417 - 421.
11. Mac Dougall D, Sale D. Effect of Interval Training and Continuous Training on Endurance, Canadian Journal of Sports Sciences. 1981; 6(2):93-97.
12. Arun Kumar Uppal. Effects of Interval Training and Two Continuous Load Methods on Cardio Respiratory and Selected Physiological Parameters, Unpublished Doctoral Dissertations, Jiwaji University, Gwalior, 1980.
13. John Loweri Macbeth. The Effect of Continuous and Interval Training on Cardiovascular Fitness and Tennis Skills of Beginning Tennis Students, Dissertation Abstracts International, 1974, 3961.