



ORIGINAL RESEARCH PAPER

Physical Education

EFFECT OF WEIGHT TRAINING AND CIRCUIT WEIGHT TRAINING ON LEG STRENGTH AND VITAL CAPACITY AMONG MALE FOOTBALL PLAYERS

KEY WORDS: Weight training, circuit weight training, leg strength and vital capacity.

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ABSTRACT

The purpose of the study was to find out the impact of weight training and circuit weight training on leg strength and vital capacity. Forty five male football players studying in S.N. College, Kannur, Kerala, aged between 17 and 21 years were selected for the study. They were divided into three equal groups, each group consisting of fifteen subjects in which two experimental groups and one control group, in which the group I (n=15) underwent weight training, group II (n = 15) underwent circuit weight training for three days (alternative days) per week for twelve weeks, and group III (n=15) acted as control, which did not participate in any training. The subjects tested on selected criterion variables such as leg strength and vital capacity at prior to and immediately after the training period. For testing the leg strength, dynamometer was used and to measure the vital capacity expirograph was used. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in the present study, the Scheffé S test was used as post-hoc test. The selected criterion variables such as leg strength and vital capacity were improved significantly for the training groups when compared with the control group. Moreover, there were no significant difference was occurred between the training groups on selected criterion variables.

INTRODUCTION

The universe has been observing the evolution of sports performance for a while now. This development was unthinkable a few years ago, but it is now typical and helps sportsmen perform better on the world stage. Intense drive is a typical cause of the lengthy and arduous hours that sportsmen put in since sport is a demanding discipline. Additionally, coaching is a sophisticated profession that benefits from the assistance of sports scientists and athletic professionals. The players' knowledge base has expanded in recent years, which has an effect on coaching and training methods. Sports science has advanced from descriptive to scientific methodologies and their application.[1]

Training also helps to carried out for an important purpose of helping the working peoples to acquire and apply the knowledge, abilities, attitudes and skills needed for the particular work. It is also a methodological procedure of continuous and progressive exercise of performing work which involving, learning and acclimatization.[2] The schedule during dynamic training should take certain things into account since the functional and psychological traits developed throughout training would be displayed during competition. To attain the goal, the maximum number of training sessions/periods should be introduced. These sessions/periods should be guided by physical, physiological, or psychological characteristics.[3] The word training in sports is commonly unwritten that it is a synonym of performing physical exercise and in broad sense; sport training is doing physical exercises to improve the overall performance.[4] Dale S. Beach[5] defines coaching as 'the geared up system by means of which humans analyze know-how and/or ability for a precise purpose'. It is a technique of instructing of unique talent to somebody, both human or animal and the intention is to enhance the capacity, overall performance ability or productiveness of an character.[6]

The term "weight training" also refers to a type of physical activity that uses resistance to enhance muscular contractions that contribute to strength, increase the measurement of skeletal muscle, and increase anaerobic endurance. It can improve general health and fitness, including the measurement of muscle, tendons, ligaments, and joints, and decreases the risk of injury[7]. It can also increase bone density, fitness, metabolism, and heart function. [8.9]

Weight training has several fundamental concepts that are crucial for anyone looking to develop their strength. These

principles entail changing the number of repetitions, sets, pace, exercise kinds, and weights in order to increase muscular strength, endurance, and size. When lifting weights, a person should adjust the precise ratio of repetitions, sets, workout type, and weights based on their personal goals. The term "Circuit Weight Training" (CWT) was first used in the early 1950s to describe a training method for boosting leg strength and endurance. The weight training activities in CWT should be completed one weight exercise station to the next with the least amount of rest possible. In order to improve overall body fitness, CWT exercises typically require between 6 and 12 workout stations, with two to three sets at each circuit.

MATERIALS AND METHODS

The purpose of this study was to determine the impact of weight training and circuit weight training on the vital capacity and leg strength. In order to accomplish the goal, 45 male football players from S.N. College in Kannur, Kerala, were chosen as subjects. They were split into three equal groups of fifteen each, two experimental groups, and a control group. Group I (n = 15) underwent weight training, Group II (n = 15) underwent circuit weight training for three days (alternate days) each week for twelve weeks, and Group III (n = 15) acted as control which did not participate in any special training apart from the regular football coaching activities. For every training programme there would be a change in various structure and systems in human body. So, the researchers consulted with the experts and then selected the following variables as criterion variables: 1. leg strength, 2. vital capacity.

DATA ANALYSIS

The differences, if any, between the corrected post test means on several criteria variables were examined independently using analysis of covariance. The Scheffé S test was used as a post-hoc test if the adjusted post test mean's "F" ratio was shown to be significant. To evaluate the "F" ratio discovered using analysis of covariance, the level of significance was set at .05 level of confidence.

Table – I Analysis of Covariance and 'F' ratio for leg strength and Vital capacity of Weight training Group, Circuit weight training Group and Control Group

| Variable Name | Group Name | Weight training Group | Circuit weight training Group | Control Group | 'F' Ratio |
|---------------|------------|-----------------------|-------------------------------|---------------|-----------|
|---------------|------------|-----------------------|-------------------------------|---------------|-----------|

| | | | | | |
|-----------------------------------|---------------------------|------------------|------------------|------------------|----------|
| Leg strength (in Kg.) | Pre-test Mean \pm S.D. | 71.86 \pm 4.09 | 70.91 \pm 3.86 | 71.16 \pm 4.11 | 0.89 |
| | Post-test Mean \pm S.D. | 75.88 \pm 3.12 | 74.19 \pm 3.19 | 70.86 \pm 4.56 | 31.12 * |
| | Adj. Post-test Mean | 76.357 | 75.511 | 71.086 | 86.23 * |
| Vital capacity (in Liters) | Pre-test Mean \pm S.D. | 4.31 \pm 0.086 | 4.28 \pm 0.055 | 4.29 \pm 0.02 | 0.41 |
| | Post-test Mean \pm S.D. | 4.58 \pm 0.016 | 4.61 \pm 0.034 | 4.22 \pm 0.071 | 52.97 * |
| | Adj. Post-test Mean | 4.596 | 4.632 | 4.199 | 114.3 9* |

* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively).

Table – I shows that pre and post test means 'f' ratio of weight training group, circuit weight training group and control group on leg strength was 1.89, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 31.12 and 86.23 which was significant at 0.05 level of confidence. The pre test means 'f' ratio of weight training group, circuit weight training group and control group on vital capacity was 0.41, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 52.97 and 114.39, which was significant at 0.05 level of confidence. The overall study shows that there was a significant decrease in leg strength and vital capacity. Further, to find out which of the paired mean significantly differ, the Scheff S test was applied and presented below.

Table - II Scheff S Test for the Difference Between the Adjusted Post-Test Mean of leg strength and Vital capacity

| Weight training Group | Circuit weight training Group | Control Group | Mean Difference | Confidence Interval at 0.05 level |
|---|-------------------------------|---------------|-----------------|-----------------------------------|
| Adjusted Post-test Mean Difference on leg strength | | | | |
| 76.357 | | 71.086 | 5.271* | 2.68 |
| 76.357 | 75.511 | | 0.846 | 2.68 |
| | 75.511 | 71.086 | 4.425* | 2.68 |
| Adjusted Post-test Mean Difference on Vital capacity | | | | |
| 4.596 | | 4.199 | 0.397* | 0.0897 |
| 4.596 | 4.632 | | 0.036 | 0.0897 |
| | 4.632 | 4.199 | 0.433* | 0.0897 |

* Significant at 0.05 level of confidence.

Table – II shows that the Scheff S Test for the difference between adjusted post-test mean of weight training group and control group (5.271) and circuit weight training group and control group (4.425) which were significant at 0.05 level of confidence. But there was no significant difference between weight training group and circuit weight training group (0.846) on leg strength after the respective training programme.

Table – II shows that the Scheff S Test for the difference between adjusted post-test mean difference in vital capacity between weight training group and control group (0.397), and circuit weight training group and control group (0.433) were significant at 0.05 level of confidence in favour of circuit weight training group. But there was no significant difference between weight training group and circuit weight training group weight training group and circuit weight training group (0.181) on leg strength after the respective training programme.

CONCLUSIONS

1. The weight training and circuit training groups has shows their improvement in leg strength than the control group.

Hanson et al., (2009) [10] found that weight training has improved the upper extremity strength. Azeem and Ameer [11] that weight training has improved the leg strength. There was no significant difference have occurred between weight training group and circuit weight training group

2. Vital capacity were significantly improved for all the training groups, such as, resistance training group and circuit weight training group when compared with the control group. Khosravi, Tayebi and Safari, [12] has found that there was a significant improvement in inspiratory reserve volume, expiratory reserve volume and tidal volume but not in vital capacity after the circuit resistance training. V.P. Singh et al [13] found that resistance training has enhanced the vital capacity. The result of the study was revealed that the circuit weight training group has significantly improved the selected physiological variables such as, Tidal volume, inspiratory reserve volume, expiratory reserve volume, vital capacity and mean arterial pressure than the weight training group and control group and weight training group have significantly improved than the control group.

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