

EFFECTS OF MULTIPLE SET RESISTANCE TRAINING ON STRENGTH POWER AND ENDURANCE OF COLLEGE SPORTSMEN

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Abstract:

The purpose of this study was to find out the effects of multiple set resistance training on strength, power and endurance of college sportsmen. To achieve the purpose of the study, thirty college sportsmen were randomly selected from Bharathiar University Coimbatore. Their age range from 18 to 25 years. They were divided into two equals Groups. The Group I was considered as Experimental Group and Group II were considered as Control group. The investigator did not made any attempt to equate the group. The control group was not given any treatment and the experimental group was given circuit training three days per week. The selected criterion variables such as arm strength was measured by 1 RM bench press, leg explosive power was measured by Sergeant vertical jump and cardio respiratory endurance was measured by step test. The data collected from the subject on multiple set resistance training on selected variables is statistically analyzed by using 't' ratio. It was concluded six week multiple set resistance training improved arm strength, leg explosive power and cardio respiratory endurance from base line to post test.

KEY WORDS:

arm strength, leg explosive power and cardio respiratory endurance.

INTRODUCTION

In the past a few studies have attempted to tackle this question with mixed results. Some research shows that single sets can be as effective as performing three sets while others show the benefits being in favour of multiple sets. However, methodological issues with some of these studies makes it difficult to use them to argue in favour of multiple sets as sometimes the multiple set group will be tested on a movement such as a free weight bench press while the single set group had previously trained on a machine version of the exercise. Similarly, examples where the subjects are tested on 1RM allows those performing multiple sets more practice with low reps in some instances as many comparisons of single versus multiple sets are also comparisons of single sets versus a periodical training program that leads into the testing week with workouts gradually reducing in reps which enables the multiple set group to garner more practice on the test.

Resistance training is an important tool for achieving a complete healthy life. Resistance training is not just for athletes, who want to build and tone muscle, or are using resistance training to achieve a better-looking body. According to the American Sports Medicine Institute (ASMI), resistance training is a "specialized method of conditioning designed to increase muscle strength, muscle endurance, and muscle power". Resistance training can be performed in a variety of ways; with resistance machines, free-weights (dumbbells and barbells), rubber tubing, or own body weight, as in doing pushups, squats, or abdominal

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crunches. The increases in muscular strength during the initial periods of a resistance training program are not associated with changes in cross-sectional area of the muscle Sale, (1988). Changes in strength evidenced in the first few weeks of resistance training are more associated with neural adaptations, Moritani & deVries, (1979), which encompass the development of more efficient neural pathways along the route to the muscle. The motor unit (motor nerve fiber and the muscle fibers it innervates) recruitment is central to the early (2 to 8 weeks) gains in strength. Collectively, the learned recruitment of additional motor units, which may respond in a synchronous (the coincident timing of impulses from 2 or more motor units) fashion (Wilmore & Costill, 1994), the increased activation of synergistic muscles, and the inhibition of neural protective mechanisms (Kraemer, 1994), all contribute to enhance the muscle's ability to generate more force. It is possible that two adjacent muscle fibers, with different motor nerves, could result in one fiber being activated to generate force while the other moves passively.

METHODOLOGY

The purpose of this study was to find out the effects of multiple set resistance training on strength, power and endurance of college sportsmen. To achieve the purpose of the study, thirty (N=30) college sportsmen were randomly selected from Bharathiar university, Coimbatore. Their age range from 18 to 25 years. They were divided into two (n=15) equals Groups. The Group I was considered as Experimental and Group II was considered as Control group. Pre test was conducted on the entire selected subject on arm strength, leg explosive power and cardio respiratory endurance and the scores were recorded in their respective units as pre test scores. After pre test the experimental group was treated with multiple set resistance training for three days for the period of six weeks. After six weeks of treatment the post test was conducted on all the subject on selected variables and the reading were recorded as post test scores. The collected pre and post scores were analyzed with 't' ratio and the result were presented in the form of tables and figures.

RESULT

Computation of 't' Ratio between Pre and Post Test Means of Control and Experimental Group arm strength

group	Pre-test mean	Standard deviation	Post-test mean	Standard deviation	't'-ratio
Experimental	6.53	1.12	7.80	1.08	8.91*
Control	6.00	.92	6.13	1.18	1.46

*significant at 0.05(2.14)

Table reveals the computation of 't' ratio between pre test and post on arm strength of college sportsmen the mean values of pre and post test of experimental group were 6.53 and 7.80 respectively. Since the obtained 't' ratio .891 was greater than the required table value 2.14 it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 14. The result clearly indicated the arm strength of experimental group had been improved. Due to the influence of multiple set resistance training, 't' between pre test and college sportsmen the mean values of pre and post test of control group were 6.00 and 6.13 respectively. Since, the obtained 't' ratio 1.00 was less than the required table value, it was found to be statistically not significant at 2.14 level of confidence degrees of freedom. The result clearly indicated the control group had not shown significantly improve.

Computation of 't' Ratio between Pre and Post Test Means of Control and Experimental Group on leg explosive power

group	Pre-test mean	Standard deviation	Post-test mean	Standard deviation	't'-ratio
Experimental	1.53	.19	2.24	.31	9.11*
Control	1.42	.18	1.46	.24	1.60

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***significant at 0.05(2.09)**

Table reveals the computation of 't' ratio between pre test and post on leg explosive power of college sportsmen the men values of pre and post test of experimental group were 1.53 and 2.24 respectively. Since the obtained 't' ratio 9.11 was greater than the required table value 2.14, it was found to be statistically significant at 0.05 level of confidence for degrees of freedom 1 and 14. The result clearly indicated the leg explosive power of experimental group had been improved. Due to the influence of multiple set resistance training. 't' between pre test and college sportsmen the mean values of pre and post test of control group were 1.42 and 1.46 respectively. Since, the obtained 't' ratio 1.60 was less than the required table value 2.14, it was found to be statistically not significant at 0.05 level of confidence degrees of freedom 1 and 14. The result clearly indicated the of control group had not shown significantly improved.

Computation of 't' Ratio between Pre and Post Test Means of Control and Experimental Group on cardio respiratory endurance

group	Pre-test mean	Standard deviation	Post-test mean	Standard deviation	t-ratio
Experimental	1939.19	458.98	2096.27	474.00	9.06*
Control	1650.64	285.48	1655.72	278.28	0.30

*significant at 0.05 (2.14)

Table reveals the computation of 't' ratio between pre test and post on cardio respiratory of college sportsmen the men values of pre and post test of experimental group were 1939.19 and 2096.27 respectively. Since the obtained 't' ratio 9.06 was lesser than the required table value 2.14, it was found to be statistically insignificant at 0.05 level of confidence for degrees of freedom 1 and 14. The result clearly indicated the cardio respiratory endurance of experimental group had been improved. Due to the influence of multiple set resistance training. 't' between pre test and college sports men the mean values of pre and post test of control group were 1650.64 and 1655.72 respectively. Since the obtained 't' ratio 0.30 was less than the required table value 2.14, it was found to be statistically not significant at 0.05 level of confidence degrees of freedom 2.14. The result clearly indicated the control group had not shown significantly improved.

FINDINGS

The following are the findings of the study

1. Significant improvement was observed on arm strength due to six weeks of circuit training.
2. Significant improvement was observed on leg explosive power due to six weeks of circuit training.
3. Insignificant improvement was observed on cardio respiratory endurance due to six weeks of circuit training.
4. No significant difference was observed on arm strength, leg explosive power and cardio respiratory endurance on control group.

CONCLUSION

It was concluded that multiple set resistance training would produce significant improvement on arm strength, leg explosive power and cardio respiratory endurance due to six weeks of multiple set resistance training. No significant changes on arm strength, leg explosive power and cardio respiratory endurance on control group.

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