



EFFECT OF MAXIMAL RESISTANCE TRAINING ON LEG STRENGTH AND BACK STRENGTH AMONG COLLEGE MEN STUDENTS

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Abstract:

The purpose of the study was designed to examine the effect of maximal resistance training on leg strength and back strength of college men students. For the purpose of the study, thirty men students studying in and around the colleges, Kadapa District, Telangana state, India were selected as subjects. They were divided into two equal groups. Each group consisted of the fifteen subjects. Group I underwent maximal resistance training for three days per week for twelve weeks. Group II acted as control who did not undergo any special training programme apart from their regular physical education programme. The following variables namely leg strength and back strength were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables by using leg lift with dynamometer and back lift with dynamometer respectively at prior to and immediately after the training programme. The analysis of covariance was used to analyze the significant difference, if any among the groups. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered appropriate. The results of the study showed that there was a significant difference between maximal resistance training group and control group on leg strength and back strength. And also it was found that there was a significant improvement on leg strength and back strength due to twelve weeks of maximal resistance training.

Key Words: Maximal Resistance Training, Leg Strength, Back Strength, College Men Students

Introduction:

Maximal Resistance Training (MRT) is a systematic strength-training method that involves lifting very high loads, typically ranging from 85% to 100% of an individual's one-repetition maximum (1RM), for a low number of repetitions and multiple sets. The primary objective of maximal resistance training is to develop maximal muscular strength by eliciting adaptations in the neuromuscular system rather than focusing solely on muscle hypertrophy.

This form of training places significant demands on the central nervous system, leading to improved motor unit recruitment, firing frequency, and synchronization of muscle fibres. As a result, maximal resistance training is considered one of the most effective methods for enhancing absolute strength, which is a foundational component for many athletic performances, particularly in sports requiring power, speed, and explosive movements.

Maximal resistance training is widely used by athletes across various disciplines, including weightlifting, power lifting, track and field, and team sports such as football and volleyball. Increased maximal strength achieved through this training enhances an athlete's ability to generate greater force against external resistance, thereby improving performance in activities such as sprinting, jumping, throwing, and tackling. Furthermore, improved strength contributes to better joint stability, injury prevention, and overall functional capacity.

In addition to its performance benefits, maximal resistance training induces positive physiological adaptations such as increased muscle fibre cross-sectional area, enhanced connective tissue strength, and improved bone mineral density.

Methodology:

The purpose of the study was designed to examine the effect of maximal resistance training on leg strength and back strength of college men students. For the purpose of the study, thirty men students studying in and around the colleges, Kadapa District, Telangana state, India were selected as subjects. They were divided into two equal groups. Each group consisted of the fifteen subjects. Group I underwent maximal resistance training for three days per week for twelve weeks. Group II acted as control who did not undergo any special training programme apart from their regular physical education programme. The following variables namely leg strength and back strength were selected as criterion variables. All the subjects of two groups were tested on

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Analysis of the Data:

Leg Strength:

The analysis of covariance on leg strength of the pre and post test scores of maximal resistance training group and control group have been analyzed and presented in table 1.

Table 1: Analysis of Covariance of the Data on Leg Strength of Pre and Post Tests Scores of Maximal Resistance Training and Control Groups

Test	Maximal Resistance Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	91.67	92.13	Between	1.63	1	1.63	1.69
S.D.	0.79	1.14	Within	27.07	28	0.97	
Post Test							
Mean	95.40	92.20	Between	76.80	1	76.80	18.10*
S.D.	1.09	1.22	Within	118.80	28	4.24	
Adjusted Post Test							
Mean	95.53	92.07	Between	85.12	1	85.12	69.62*
			Within	33.01	27	1.22	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 28 and 2 and 27 are 3.34 and 3.35 respectively).

The table 1 shows that the adjusted post-test means of maximal resistance training group and control group are 95.53 and 92.07 respectively on leg strength. The obtained "F" ratio of 69.62 for adjusted post-test means is more than the table value of 3.35 for df 1 and 27 required for significance at .05 level of confidence on leg strength.

The results of the study indicated that there was a significant difference between the adjusted post-test means of maximal resistance training group and control group on leg strength.

Back Strength:

The analysis of covariance on back strength of the pre and post test scores of maximal resistance training group and control group have been analyzed and presented in table 2.

Table 2: Analysis of Covariance of the Data on Back Strength of Pre and Post Tests Scores of Maximal Resistance Training and Control Groups

Test	Maximal Resistance Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	92.20	92.62	Between	1.34	1	1.34	1.11
S.D.	0.98	1.31	Within	33.71	28	1.20	
Post Test							
Mean	94.47	92.93	Between	17.63	1	17.63	7.93*
S.D.	1.13	1.12	Within	62.30	28	2.22	
Adjusted Post Test							
Mean	94.62	92.78	Between	24.22	1	24.22	23.59*
			Within	27.73	27	1.03	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 28 and 2 and 27 are 3.34 and 3.35 respectively).

The table 2 shows that the adjusted post-test means of maximal resistance training group and control group are 94.62 and 92.78 respectively on back strength. The obtained "F" ratio of 23.59 for adjusted post-test means is more than the table value of 3.35 for df 1 and 27 required for significance at .05 level of confidence on back strength.

The results of the study indicated that there was a significant difference between the adjusted post-test means of maximal resistance training group and control group on back strength.

Conclusions:

- There was a significant difference between maximal resistance training group and control group on leg strength and back strength.

- And also it was found that there was a significant improvement on selected criterion variables such as leg strength and back strength due to maximal resistance training.

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