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## Effects of plyometric combined weight training on muscular strength

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### Abstract

The purpose of the present investigation was to find out the effect of plyometric combined weight training on improving muscular strength. To achieve this purpose, twenty men students were selected randomly as subjects. They were assigned randomly into experimental and control groups on ten each. Group I underwent plyometric combined weight training and group II acted as control. All the subjects of two groups were tested on muscular strength. Analysis of covariance was used to determine the significantly difference existing between pre test and post test on muscular strength. The result of the study proved that due to the effect of plyometric combined weight training improved muscular strength of the subjects.

**Keywords:** Plyometric combined weight training, muscular strength

### Introduction

Weight training increases muscle strength by pitting muscles against a weight, such as a dumbbell, barbell or other type of resistance. A rubberized band can even be used. Weight training can increase muscle strength and bone density and reduce body fat. Weight training, also called weight training or strength training, is pitting muscles against a resistance such as a weight or other type of resistance, to build the strength, anaerobic endurance, and/or size of skeletal muscles. A well-rounded program of physical activity includes strength training, to improve bone, joint function, bone density, muscle, tendon and ligament strength, as well as aerobic exercise, to improve our heart and lung fitness. These activities should work all the major muscle groups of our body (*legs, hips, back, chest, abdomen, shoulders, and arms*).

Building strong leg, arm and abdominal muscles along with other muscle groups will assist in the execution of sports fundamentals and the enjoyment of the game. All strength training involves the microscopic tearing of the muscle fibers by exceeding their capacity to move a weight or resist a force. As the body rebuilds the fibers, strength increases.

### Methodology

#### Subjects and Variables

The purpose of the study was to find out the effects of plyometric combined weight training on muscular strength. To achieve the purpose of the study twenty students from department of agriculture, Annamalai University were selected as subjects. The age, height and weight of the subjects ranged from 18 to 23 years, 162 to 175 centimeters and 50 to 65 kg respectively. They were assigned randomly into experimental and control groups on ten each. Group I underwent weight training and group II acted as control. All the subjects of two groups were tested on muscular strength. Analysis of covariance was used to determine the significantly difference existing between pre-test and post-test on muscular strength. Muscular strength was measured by 1 RM bench press test.

#### Training Protocol

The training programmes were scheduled for one session a day each session lasted between thirty five to forty five minutes approximately including warming up and warming down. During the training period, the experimental groups underwent plyometric combined weight training programme three days per week (alternative days) for six weeks.

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The weight training group performed in the gym the initial intensity start from 45% to 70% of their 1RM and it was progressively increased every week by 5% for 6 weeks.

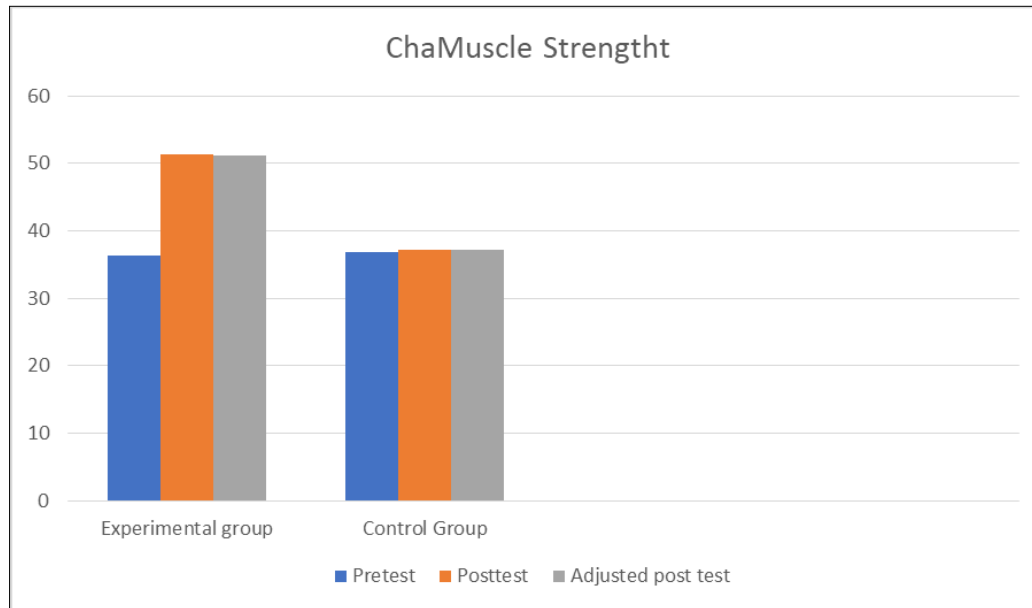
## Experimental Design and Statistical Results

**Table 1:** Analysis of covariance on muscular strength of experimental and control groups

	Experimental Group	Control Group	SoV	Sum of Squares	df	Mean squares	F <sup>**</sup> ratio
Pre-Test	36.4	36.9	B	1.2	1	1.2	0.57
Mean SD	1.57	1.3	W	39.3	18	2.1	
Post-test Mean	51.3	37.2	B	994.0	1	994.0	208.78*
SD	2.5	1.7	W	85.7	18	4.7	
Adjusted Post Test Mean	51.2	37.2		949.5	1	949.5	192.01*
				84.0	17	17 4.1	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 17 is 4.45 and degree of freedom 1 and 18 is 4.41.)

\*Significant at .05 level of confidence



**Fig 1:** ChaMuscle Strength

Table – I shows that the pre-test means and standard deviation on muscular strength of weight training and control groups are 36.4 + 1.5 and 36.9 + 1.37 respectively. The obtained F<sup>\*</sup> ratio value is 0.57 of muscular strength was less than the required table value of 4.45 for the degrees of freedom 1 and 18 at 0.05 level of confidence. The post-test means and standard deviation on muscular strength of weight training and control groups are 51.3 + 2.5 and 37.2 + 1.6 respectively. The obtained F<sup>\*</sup> ratio value is 208.78 of muscular strength was greater than the required table value of 4.45 for the degrees of freedom 1 and 18 at 0.05 level of confidence. The adjusted post-test means on muscular strength of weight training and control groups are 51.2 and 37.2 respectively. The obtained F<sup>\*</sup> ratio value is 192.01 of muscular strength was greater than the required table value of 4.41 for the degrees of freedom 1 and 17 at 0.05 level of confidence. Hence it was concluded that due to the effect of six weeks of weight training the muscular strength of the subjects was significantly improved.

### Discussion and Conclusions

The result of the study shows that due to the six weeks of weight training improved the muscular strength of subjects. The following studies are supporting the above findings. Sherk *et al.*, (2012) [4] study results showed that the upper and lower body strengths were still significantly higher than baseline values. Eric *et al.*, (2002) [1] found that resistance training increased muscular strength for women. Mikel *et al.*,

(2006) [2] investigation demonstrated a potential beneficial stimulus of improving strength and power for men.

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