



EFFECT OF PLYOMETRIC TRAINING ON EXPLOSIVE POWER AND ELASTIC POWER AMONG COLLEGE MEN STUDENTS

Anwerpasha Mohammed* & M. Velmurugan**

* Research Scholar, Department of Physical Education, Annamalai University, Tamil Nadu, India

** Assistant Professor, Department of Physical Education, Annamalai University, Tamil Nadu, India

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Abstract:

The purpose of the study was designed to examine the effect of plyometric training on explosive power and elastic power 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 plyometric 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 explosive power and elastic power were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables by using vertical jump and bunny hops 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 plyometric training group and control group on explosive power and elastic power. And also it was found that there was a significant improvement on explosive power and elastic power due to twelve weeks of plyometric training.

Key Words: Plyometric Training, Explosive Power, Elastic Power, College Men Students

Introduction:

Plyometric training is a dynamic and high-intensity training method designed to enhance muscular power, speed, and neuromuscular efficiency. The term plyometrics is derived from the Greek words "pleythein" (to increase) and "metric" (measure), indicating exercises that aim to increase the explosive capability of muscles. Plyometric exercises involve rapid stretching of a muscle (eccentric phase) immediately followed by a powerful shortening contraction (concentric phase), a process known as the stretch-shortening cycle (SSC).

The primary objective of plyometric training is to improve the ability of the neuromuscular system to produce maximal force in the shortest possible time. This form of training enhances the elastic properties of muscles and tendons and improves motor unit recruitment, firing frequency, and inter-muscular coordination. As a result, plyometric training is widely used in sports that require explosive movements such as jumping, sprinting, throwing, and rapid changes of direction, including athletics, volleyball, basketball, football, and badminton.

Plyometric training exercises include movements such as jump squats, bounding, hopping, depth jumps, and medicine ball throws. These exercises simulate sport-specific actions and help athletes transfer strength gains into functional, explosive performance. When performed systematically and with proper technique, plyometric training contributes significantly to improvements in vertical and horizontal jump performance, sprint speed, agility, and reactive strength.

In addition to performance enhancement, plyometric training plays an important role in injury prevention when appropriately prescribed. It improves joint stability, proprioception, and muscle-tendon resilience, particularly in the lower extremities. However, due to its high mechanical and neuromuscular demands, plyometric training should be introduced progressively and is recommended for individuals with an adequate strength base and sound movement mechanics.

Plyometric training is an effective and scientifically supported training method that bridges the gap between strength and speed. Its application in physical education and sports training programmes contributes to the development of explosive power, athletic performance, and overall functional fitness.

Methodology:

The purpose of the study was designed to examine the effect of plyometric training on explosive power and elastic power 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 plyometric 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 explosive power and elastic power were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables by using vertical jump and bunny hops 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.

Analysis of the Data:

Explosive Power:

The analysis of covariance on explosive power of the pre and post test scores of plyometric training group and control group have been analyzed and presented in table 1.

Table 1: Analysis of Covariance of the Data on Explosive Power of Pre and Post Tests Scores of Plyometric Training and Control Groups

Test	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	38.87	39.20	Between	0.83	1	0.8333	0.10
S.D.	2.75	2.22	Within	230.13	28	8.2190	
Post Test							
Mean	43.00	39.27	Between	104.53	1	104.5333	10.11*
S.D.	2.79	2.72	Within	289.47	28	10.3381	
Adjusted Post Test							
Mean	43.14	39.13	Between	120.10	1	120.0953	116.90*
			Within	27.74	27	1.0273	

* 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 plyometric training group and control group are 43.14 and 39.13 respectively on explosive power. The obtained "F" ratio of 116.90 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 explosive power.

The results of the study indicated that there was a significant difference between the adjusted post-test means of plyometric training group and control group on explosive power.

Elastic Power:

The analysis of covariance on elastic power of the pre and post test scores of plyometric training group and control group have been analyzed and presented in table 2.

Table 2: Analysis of Covariance of the Data on Elastic Power of Pre and Post Tests Scores of Plyometric Training and Control Groups

Test	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	4.85	4.87	Between	0.0039	1	0.0039	0.81
S.D.	0.06	0.11	Within	0.1328	28	0.0047	
Post Test							
Mean	5.20	4.90	Between	0.6660	1	0.6660	19.74*
S.D.	0.07	0.08	Within	0.9445	28	0.0337	
Adjusted Post Test							
Mean	5.21	4.89	Between	0.7358	1	0.7358	117.79*
			Within	0.1777	27	0.0066	

* 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 plyometric training group and control group are 5.21 and 4.89 respectively on elastic power. The obtained "F" ratio of 117.79 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 elastic power.

The results of the study indicated that there was a significant difference between the adjusted post-test means of plyometric training group and control group on elastic power.

Conclusions:

- There was a significant difference between plyometric training group and control group on explosive power and elastic power.
- And also it was found that there was a significant improvement on selected criterion variables such as explosive power and elastic power due to plyometric training.

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