



Effect of Plyo Pyramid and Combo Exercises on Explosive Strength Parameters among College Students

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ABSTRACT

The study was to examine the isolated and combined plyo pyramid and combo exercises on explosive strength of college students. Total recruited randomly N=60 (sixty) men students their age period ranged from 18 years to 25 years as per subject's secondary board of education certificate and, who at least participated collegiate level competition in any one sports from various college of Anantapur Andhra Pradesh. The recruited students were randomly recruited into four groups each group n=15 men student's i.e. empirical groups I underwent: plyometric pyramid exercises group (PPE), empirical group II students underwent: combo exercises group (CEG), empirical group III underwent: combined plyo pyramid and combo exercises group (PCE), and control group students (CGS). CGS was practiced only their respective specialization game. The training period was fixed for 14- week's duration and three sessions in a week. The measurement of explosive strength abilities scores was collected through standing broad jump (meters) before and after the completion of specific training. The collected score's were analyzed through ANCOVA and level of significant was restricted at 0.05 levels. The study found that isolated, combined plyo pyramid and combo exercises program had positive significant impact in increasing the explosive strength parameter performance of students of three empirical group's players comparative to control group.

Keywords: – Plyometric, Pyramid, Combo, Exercises, Explosive Strength

Introduction:

The word plyometrics, popularized by the American Fred Wilt in his writings in the 1960s and 1970s, is derived from the Greek words plethyein (to increase) and isometric (in relation to the muscle action). Plyometrics is a method of training muscle elastic strength and explosiveness to enhance athletic performance. The three components of plyometric exercises are Eccentric Pre-Stretch. The eccentric pre-stretch phase has also been described as the readiness, pre-loading, pre-setting, preparatory, facilitatory, readiness, potentiation, counter-force, or counter-movement phase, Amortization Phase (Time to Rebound) and Concentric Shortening Phase.

Combination Training is an integrated form of training that combines lower body, upper body, trunk musculature and balance training all into one exercise, accomplishing three times as much training in the same amount of time. Combination Training is also a more natural and functional way of training. A combo exercise also improves power, and helps to train for everyday life. Combo lifts are often done when you perform 1 rep of an exercise + another, then repeat. For example, curl the dumbbells + Overhead press.

Statement of the Research Problem:

To analyze the “isolated and combined plyo pyramid and combo exercises on explosive strength of college students”.

Objectives of this research study

1. The primary objective of this research study is to evaluate the 12-weeks influence of plyometric pyramid and combo exercises on explosive strength of college students.
2. The secondary objective of this research are
 - To compare the selected training methods between plyometric pyramid, combo exercises and combined plyometric pyramid and combo exercises on explosive strength of college students.
 - To judge the best suitable training program among selected three treatments for enhancement of explosive strength of students.

Research Hypothesis:

- There will be a significant increase in score of explosive strength parameters performance of empirical group's students after the twelve weeks impact of isolated and combined plyometric pyramid and combo exercises when compared with control group students.
- The combined plyometric pyramid and combo exercises will be more effective than the isolated training program.

Methodology:

The study was to examine the isolated and combined isolated and combined plyometric pyramid and combo exercises on explosive strength of college students. Total recruited randomly N=60 (sixty) men students their age period ranged from 18 years to 25 years as per subject's secondary board of education certificate and, who at least participated collegiate level competition in any one sports from various college of Anantapur Andhra Pradesh. The recruited students were randomly recruited into four groups each group n=15 men student's i.e. empirical groups I underwent: plyometric pyramid exercises group (PPE), empirical group II students underwent: combo exercises group (CEG), empirical group III underwent: combined plyo pyramid and combo exercises group (PCE), and control group students (CGS). CGS was practiced only their respective specialization game. The training period was fixed for 14- week's duration and three sessions in a week. The measurement of explosive strength abilities scores was collected through standing broad jump (meters) before and after the completion of specific training. The collected score's were analyzed through ANCOVA and level of significant was restricted at 0.05 levels.

Table - I
Analysis of Covariance for Explosive Strength – Standing Broad Jump of the PPE, CEG, PCE and CGS groups Students

Groups	PPE	CEG	PCE	CGS	SOV	Sum of squares	df	Mean Square	F' Ratio
Pre test mean	1.898	1.857	1.864	1.867	B	0.015	3	0.005	0.076 ^{NS}
SD	0.296	0.256	0.236	0.237	W	3.733	56	0.067	
Post test mean	2.059	1.996	2.231	1.788	B	2.152	3	0.717	15.26*
SD	0.277	0.168	0.189	0.215	W	2.631	56	0.047	
Adjusted mean	2.046	2.004	2.323	1.791	B	2.154	3	0.718	23.984*
					W	1.647	55	0.030	
Mean difference	+0.161	+0.139	+0.367	-0.079	-	-	-	-	-

Note: Table F-ratio value at 0.05 level of confidence for 3 and 55 (df) =2.77, 3 and 56 (df) =2.77*Significant & NS: Not significant.

PPE : Plyometric pyramid exercises group.
 CEG : Combo exercises group.
 PCE : Combined plyo pyramid and combo exercises group.
 CGS : Control group Students

The above table-I shows that there is a significant difference on explosive strength performance among the four groups such as PPE : Plyometric pyramid exercises group, CEG : Combo exercises group, PCE : Combined plyo pyramid and combo exercises group and CGS : Control group Students. Since the 'F' value required being significant at 0.05 level for d/f 3, 56 and 3, 55 are 2.77 and 2.77, but the computation values of explosive strength post and adjusted posttest 'F' values are 15.26 and 23.984 respectively. Which are greater than the tabulated value, it shows that training is effective for positive changes in explosive strength performance. Since the obtained 'F' ratio is found significant.

TABLE: 2

The Explosive Strength Results of Scheffe's Method Test Mean Differences between PPE, CEG, PCE and CGS Group's Students

PPE	CEG	PCE	CGS	MD	CI
2.046	2.004	-	-	0.042 ^{NS}	0.182
2.046	-	2.323	-	0.277*	
2.046	-	-	1.791	0.255*	
-	2.004	2.323	-	0.319*	
-	2.004	-	1.791	0.213*	
-	-	2.323	1.791	0.532*	

Note: * Significant & NS: No significant

PPE : Plyometric pyramid exercises group.

CEG : Combo exercises group.

PCE : Combined plyo pyramid and combo exercises group.

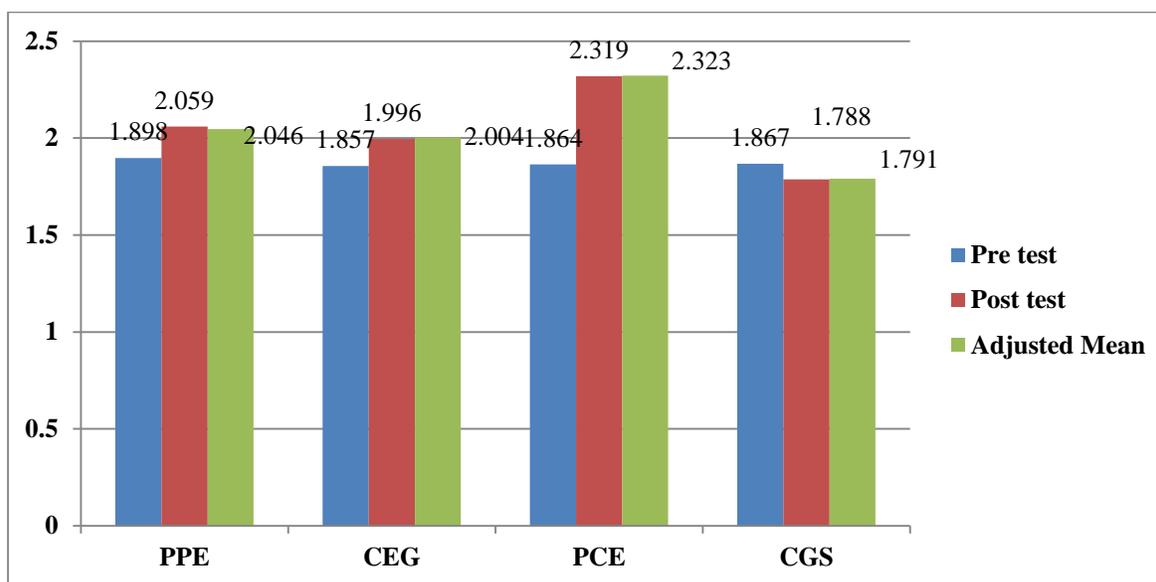
CGS : Control group Students

In above table: 2 display the mean differences between the as PPE : Plyometric pyramid exercises group, CEG : Combo exercises group, PCE : Combined plyo pyramid and combo exercises group and CGS : Control group Students.

The mean differences between PPE : Plyometric pyramid exercises group and PCE : Combined plyo pyramid and combo exercises group, PPE : Plyometric pyramid exercises group and CGS : Control group Students, CEG: Combo exercises group and PCE : Combined plyo pyramid and combo exercises group, CEG: Combo exercises group and CGS : Control group Students, PCE : Combined plyo pyramid and combo exercises group and CGS : Control group Students are 0.277, 0.255, 0.319, 0.213 and 0.532 These means differences values are higher than CI value 0.182. Therefore researcher noted significant differences present between training groups and control groups after treatment period.

The mean differences between PPE : Plyometric pyramid exercises group and CEG : Combo exercises group is 0.042. This means differences value, which is lower than CI value 0.182. Therefore researcher noted no significant differences present between both isolated training groups after twelve weeks treatment program.

FIGURE: 1 THE EXPLOSIVE STRENGTH PRE POST AND ADJUSTED POST TEST MEAN NUMBERS OF PPE, CEG, PCE and CGS GROUPS PRESENTED IN BAR GRAPH



PPE : Plyometric pyramid exercises group.

CEG : Combo exercises group.

PCE : Combined plyo pyramid and combo exercises group.

CGS : Control group Students

Discussion on Hypothesis:

- The first hypotheses stated that there will be a significant increase in score of explosive strength parameters performance of empirical group's students after the twelve weeks impact of isolated and combined plyometric pyramid and combo exercises when compared with control group students. The statistical analysis proved that isolated, combined plyometric pyramid and combo exercises program significantly increased the explosive strength performance. Hence research first hypothesis accepted.
- The second hypotheses stated that combined plyometric pyramid and combo exercises will be more effective than the isolated training program. The statistical analysis proved combined training is superior to isolated training method. Hence research second hypotheses accepted.

Discussion and Findings:

The implementation of 12-weeks progressive plyometric pyramid and combo exercises training program are effective for increasing explosive strength – standing broad jump performance of students comparative to control group students. The various sports training effect on explosive strength are Aditya (2014) found that combined complex training with core exercises program has capability to bring positive increase in explosive strength of football players. Khadijeh and Morteza (2014) study shown that applying plyometric exercises, strength training exercises and combined training to increase leg explosive power parameters performance especially in young male Kabaddi players. Vinoth and Logeswaran (2023) study results proved that 12-weeks core strength training resulted significant impact for increasing leg explosive power of inter-school boy's handball players. Amir et al., (2021) experiment shows that exercises using vertical and horizontal plyometric training protocol varied style of deep jumps are effective in the development of muscular capacity of long jumpers, which resulted in sports excellent performance for increasing in vertical jump, and long jump performance of

athletes. Camelia et al., (2020) experiment study concluded that plyometric exercises workouts including depth jumps contribute for reaching the target of increasing lower body explosive strength scores. Srinivasa (2020) suggested that the application of varied exercises resulted in improvement of explosive strength performance.

Conclusions:

Investigator recorded that impact of 12-weeks progressive impact of plyometric pyramid and combo exercises training program are effective for increasing explosive strength of empirical group's students. Whereas combined plyometric pyramid and combo exercises training program is more effective than isolated training for enhancing the explosive strength. Therefore isolated plyometric pyramid and combo exercises training program is equally effective for improving explosive strength parameters.

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