Effect of Plyometric Exercises on Shot-put Performance on Selected High School Boys

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ABSTRACT:
The aim of this study is to present the effect of plyometric exercises on performance of school boys. The researcher selected sixty (N=60) high school boys from Chimmapudi, Khammam dist. Telangana, region as subjects at random sampling and their ages are in between 14- 17 years. The subjects were divided into two identical groups of thirty subjects each. Group –I defined as Experimental Group (Plyometric Exercise Training (PT). Group – II treated as Control Group (CG). The dependent variables namely shot put performance, and standing broad jump were selected and measured by shot-put through test and standing broad jump test for this study. The data was analysed by descriptive measures, data visualisation and small sampling test for paired mean difference‘t’ test. The obtained t-statistic value tested at 0.05 level of significance. The entire analysis of the data revealed that there was a significant improvement on the two variables namely shot-put performance and standing broad jump by the application of plyometric exercise training..

Key words: *Plyometric exercise, shot-put, standing broad jump, paired t-test*

I. INTRODUTION

Plyometric, also popularly known as "jump training" or "plyos", are exercises in which muscles exert maximum force in short intervals of time span, with the goal of increasing power (speed-strength). This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, such as in specialized repeated jumping. Plyometric are primarily used by athletes, especially martial artists, sprinters and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree. Plyometric includes explosive powerful training exercises that are trained to activate the quick response and elastic properties of the major muscles in the body. It was initially made well-known by Soviet Olympians in the 1970s, providing the core element in the strength programs of elite sporting athletes worldwide. Sports using plyometric include basketball, tennis, badminton, squash and volleyball as well as the various codes of football.(Wilt, Fred 1984). The shot-put performance and standing broad jump were explained briefely as below.

a. Shot-put Performance:

Shot-put is a dynamic event demanding high power production (Terzis et al. 2003). One of the parameters, which determine the power production of a muscle group (or the whole body), is muscular strength but the relationship between strength and shot-put performance has not been thoroughly examined. They investigated the relationship between squat and bench press muscular strength and shotput performance. The study was to investigate the effect of plyometric exercises on shot-put performance.

b. The Standing Broad Jump

The standing broad jump is an effective way to measure development in athletes and gym users and is one of the most impressive tests. It's a true measure of lower-body power and an excellent indicator of overall athleticism. For skill positions, like running back, wide receiver and defensive back, this test is critical. Like other Combine tests, the Standing Broad Jump may seem simple to the uninitiated; however, the correct technique that enables 10- or 11-foot jumps is quite complex. We have to use your upper body as well as your lower body to propel yourself up and out on each attempt. The study emphasise the effect of plyometric exercises on performance.

Motor fitness components-A study

The term components of motor fitness refers to the several key components required to facilitate quality overall fitness. In most traditional circles, there are considered to be five general components of fitness: cardio respiratory endurance, muscular strength, muscular endurance, flexibility, and body composition, although healthy body composition is most often a by-product of the other components, and is therefore not recognized in some circles as an actual "component" of fitness. Following the five general components of fitness are the components of "motor" fitness, which most affect athletic performance. These include muscular power, speed, balance, coordination, accuracy, and agility. Reaction time is also considered by some to be a component of motor fitness, however, some also contend that it is a type of speed, i.e. "reaction speed". Improvements in endurance, stamina, strength, and flexibility come about through conditioning/training. Training refers to activity that improves performance through a measurable organic change in the body. Concurrently, improvements in coordination, agility, balance, and accuracy are developed through practice. Practice refers to activity that improves performance through changes in the nervous system. Power and speed are adaptations of both training and practice.(Brookes, Douglas S 2004).

II. RESRACH METHODOLOGY

For this study, sixty (N=60) male shot put performance schoolboys who represented for their schools from ZPSS High School, Chimmapudi, Khammam dist. Telangana state were selected as subjects at random and their ages ranged from 14 to 17 years. The subjects were divided into two equal groups of thirty each. Experimental Group was given 12 weeks (Duration - 12 weeks, Session - 3 days / week, Duration of one session - One hour) of plyometric exercise training and the control group was not given any specific training. Experimental Group –I (Plyometric exercise Training (PT) were given to experimental group. The subjects were tested in selected variables namely shot-put performance and standing broad jump by shot-put and standing broad jump test for this study. Before and after the training period the data were collected. Data analysis was done by paired t-test using SPSS tool. The level of significance was considered at 0.05 Level.

III. OBJECTIVES OF THE STUDY

The study has been planned with the following two objectives:

1. To study the effect of plyometric exercises on Shot-put Performance on High School Boys.
2. To study the effect of plyometric exercises on standing broad jump on High School boys

IV. HYPOTHESES OF THE STUDY

It has been set up the hypotheses that the plyomertic training will improve physical fitness and skills among the selected high school boys

1. There is no significant effect of physical fitness and skills such as shot-put performance among the high school boys in Control Group
2. There is a significant effect of physical fitness and skills such as shot-put performance among high school boys in Experimental Group

V. SELECTION OF VARIABLES

The research scholar reviewed the available scientific literature pertaining to the problem from books, journals, magazines, websites, and research papers which revealed the importance of Plyometric Exercise Training. Taking into consideration of feasibility criteria and availability ofthe instruments the following variables were selected for this study.

Dependent Variables: Motor Fitness Components

1. Shot-put performance.
2. Standing broad jump.

Independent Variable: Plyometric Exercise Training.

VI. TABULATION OF DATA AND ANALYSIS

TABLE-I

COMPUTATION OF 'T'-RATIO BETWEEN THE PRE AND POST TESTS ON SHOT PUT PERFORMANCE OF EXPERIMENTAL AND CONTROL GROUPS

Group	Test	M	SD	σ DM	DM	t-ratio	'P' value
Experimental	Pre Test	4.91	1.15	0.25	0.46	10.239*	0.01
	Post Test	5.37	1.14				
Control	Pre Test	4.23	1.26	0.26	0.01	2.021	0.06
	Post Test	4.24	1.27				

* significance at 0.05 level.

The table I indicates that there was a significant improvement on the shot-put performance through the plyometric exercise training. It reveals that the obtained t-ratio 10.239 is significant since 'p' value is lesser than the 0.05, there was a significant improvement between pre and post tests on shot-put performance. So there was a significant improvement on the strength between the pre and post tests of the experimental group, whereas control group showed no significant improvement. Hence the results indicate that the significant improvement on the shot-put performance was due to the plyometric exercise (PT) training alone.

FIGURE-I

Figure Showing the Mean Difference of Pre and Post Tests on shot of Experimental and Control Groups

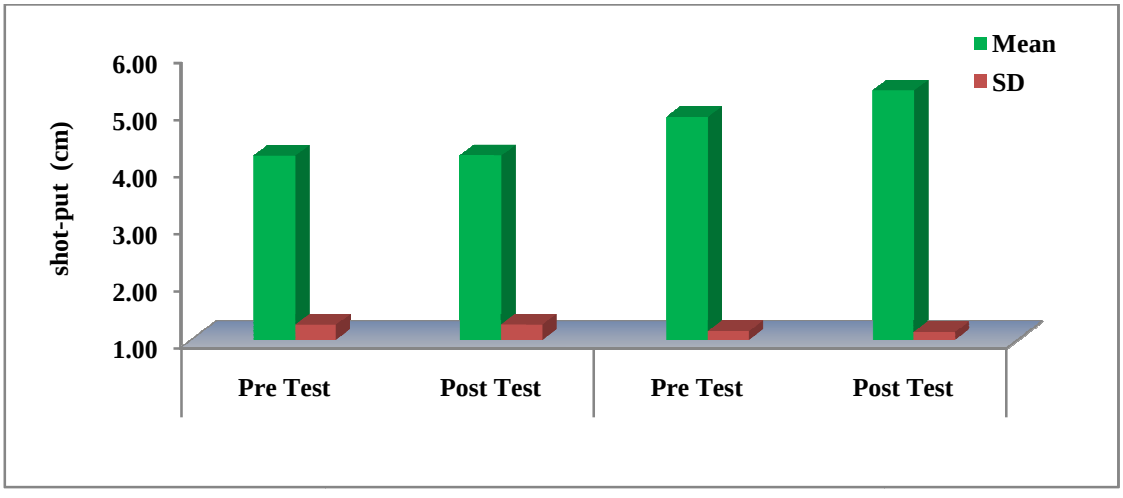


TABLE-II

COMPUTATION OF 'T'-RATIO BETWEEN THE PRE AND POST TESTS ON STANDING BROAD JUMP OF EXPERIMENTAL AND CONTROL GROUPS

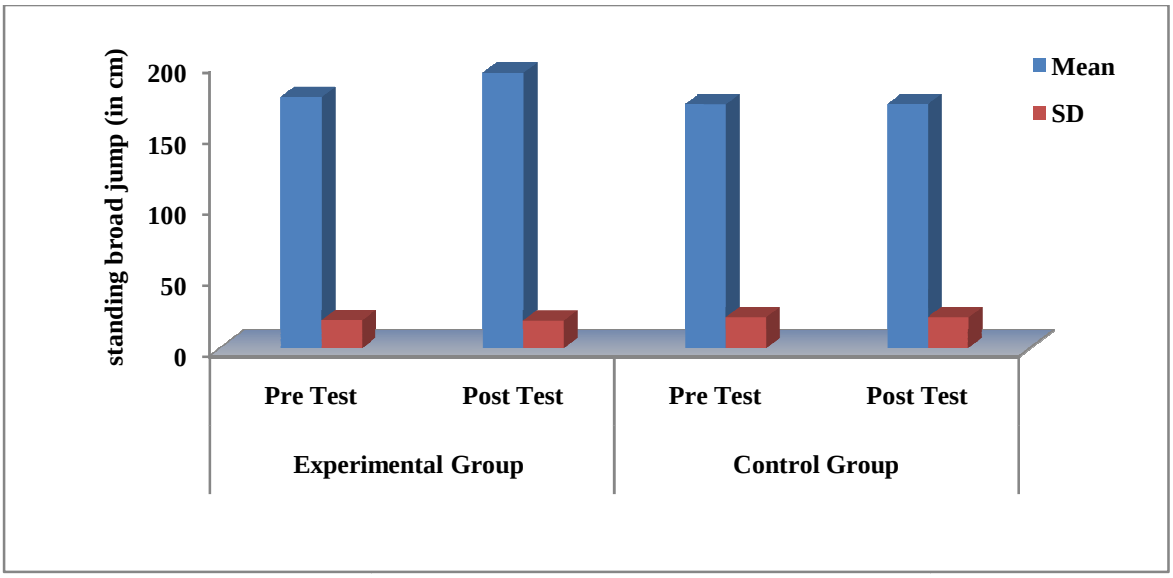
Group	Test	M	SD	σ DM	DM	t-ratio	'P' value
Experimental	**Pre Test**	176.97	19.68	0.66	17.20	25.815*	0.01
	Post Test	194.17	19.52				
Control	**Pre Test**	171.77	21.81	.056	0.10	1.795	0.08
	Post Test	171.87	21.84				

* Significance at 0.05 levels

The table II indicates that there was a significant improvement on the standing broad jump through the of plyometric exercise training. It reveals that the obtained t-ratio 25.815is significant since 'p' value is lesser than the 0.05, there was significant improvement between pre and post tests on the selected motor fitness components namely shot-put performance. So there was a significant improvement on the shot-put performance between the pre and post tests of the experimental group, whereas control group showed no significant improvement. Hence the results indicate that the significant improvement on the shot-put performance was due to the plyometric exercise (PT) training alone.

FIGURE-II

Figure Showing the Mean Difference of Pre and Post Tests Shot-put performance of Experimental and Control Groups



VII. RESULTS AND FINDINGS

The result of the study reveals that the twelve weeks of plyometric exercise training on selected dependent variables. There was a significant improvement on shot-put through the plyometric exercise training (PT). It reveals that mean ± sd values in experimental group were found to be 176.97 ± 19.68 and 194.17 ± 19.52 in pre and post test respectively and the obtained t-ratio 25.815 is significant and since 'p' value is lesser than the 0.05 there was a significant improvement between pre and post tests on shot-put performance. So there was a significant improvement on the shot-put performance between pre and post-tests of experimental group, whereas control group showed no significant improvement since mean±sd values in control group were 4.23 ± 1.26, 4.24 ± 1.27, t-ratio 1.795 with p-value 0.06.

Hence the results indicate that the significant improvement on the shot-put performance was due to the plyometric exercise (PT) training alone. The results of the study were in supporting with the research done by Nanda Kumar and (2015).

The result of the study showed that the twelve weeks of plyometric exercise training on the selected dependent variables. There was a significant improvement on standing broad jump through the plyometric exercise training (PT). It reveals that mean±sd values in experimental group were found to be 4.91 ±1.15, 5.37 ±1.14 in pre and post test respectively and the obtained t-ratio 10.239 is significant and since 'p' value is lesser than the 0.05 there was a significant improvement between pre and post tests on strength. So there was a significant improvement on the strength between pre and post-tests of experimental group, whereas control group showed no significant improvement since mean ± sd values in control group were 171.77±21.81, 171.87± 21.84 with p-value 0.06.

Hence the results indicate that the significant improvement on standing broad jump was due to the plyometric exercise (PT) training alone. The results of the study were in agreed with the research done by Faigenum et al. (2011).

VIII. CONCLUSIONS

In this section from the above results, data analysis and findings conclusions were made.

Results of the present study suggest that there was a significant improvement on the selected Motor Fitness Components dependent variables namely shot-put performance and standing broad jump by applying the plyometric exercise training (PT). This kind of analysis is very useful in dimensioning the performance of shot-put players.

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