



## Effect of Plyometric Training Programme on Back Strength and Explosive Power

Dr. R. Venkatachalapathy

Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu, India.

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### Abstract

The purpose of the study was to find out the effect of plyometric training programme on back strength and explosive power. To achieve this purpose, 20 male students were randomly selected as subjects from the Department of Physical Education and Sports Sciences, Annamalai University studying in various classes. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into two equal groups of 10 subjects each in which group - I underwent plyometric training programme for three days per week for eight weeks and group - II acted as control who were not undergo any special training programme. The selected criterion variables such as back strength and explosive power in terms of vertical distances were assessed by administering back lift with dynamometer and Sergeant Jump respectively, before and after the training period. The collected data were statistically analysed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant improvement on back strength and explosive power for plyometric training group when compared with the control group.

**Keywords:** Plyometric Training, Back Strength, Explosive Power.

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### Introduction

The major objective in training is to cause biological adaptation in any to improve performance in a specific task, to enhance physiological improvement effectively and to bring about a change. Specific exercise and overload must be followed, by exercising at a level above normal a variety of training adaptation take place in the body that makes it to function more efficiently. Numerous training procedures are in practice to improve each and every physical and motor fitness. Basic training procedures will serve better when utilized with modification suited to the individual or a group dealt with the best training program is that which increases the desired quality at as higher rate without cause unwanted effects.

Training involves constructing an exercise programme to develop an athlete for particular event. This increasing skill and energy capacities are equal consideration. Without competition, training is meaningless to-day. Sports training are based on the competitive motive. Each nation is trying to achieve top level performance and to win laurels in international competitions. To days records are proved to be lower performance of tomorrow. This is because greater stages less been laid on the quality rather than quantity of training.

Plyometrics refers to a type of intense training that maybe undertaken by an athlete who wants to improve speed power. This type of training also refers to very fast, explosive excision (normally performed with body weight) to improve power out-put and neural activation of the mussels (the ability for a muscle to contract quickly). Basically phonetics relies on an element of physiology call the stretch-shorten cycle (S & C). This stretch-shorten cycle means that the muscle is rapidly stretched and then contracted which increases the force applied on the muscle. Receptors within the muscle called muscle spindles react to this sudden stretching by sending a signal to the brain saying this stretching is potentially dangerous than the train contracts the muscle to stop the stretching this serves to protect the stretch and prefect against any possible injury.

Polymeric training is specific work for the enhancement of explosive power. It improves the relationship between maximum strength and explosive power plyometric training utilizes the elastic energy and myopic reflex in the development of power. The muscle will resist overstretching and the kinetic energy developed in the amortization phase will be utilized to cause a powerful contraction to prevent over stretching of the affected muscle. Thus the movement generated by the athlete acts as the overload to eccentrically stretch the muscle before concentric contraction, a greater amount of elastic. Energy is stored in the muscles, this elastic energy is then re-used in the following concentric contraction, making that contraction stranger the key is a shot coupling time or the time it takes for the muscle to switch from the lengthening/yielding phase to the

### Correspondence

Dr.R.Venkatachalapathy  
E-mail: rvenkitan@gmail.com

shorting over coming work phase. This leads to a fundamental plyometric principle: the rate, not the magnitude of the strength is what determined. The use of elastic energy and the transfer of chemical energy into mechanical work the improvement is skeletal muscle performance that occurs with initial pre-stretching can be identified as the combined effects of both storage of elastic energy and the myotatic reflex activities of the muscle. However the percentage of contribution from each component is not known.

### Methodology

The purpose of this study was to find out the effect of plyometric training on back strength and explosive power in terms of vertical distances. To achieve the purpose of this study 20 collage male students who were studying in the Department of Physical Education and Sports Sciences, Annamalai University during the academic year 2017-2018 were randomly selected as subjects. The age of the subjects were ranged from 18 to 25 years. The selected subjects

were divided into two groups of ten subjects each. Group I considered as experimental group who underwent plyometric training for eight weeks and Group II considered as control that did not undergo any special training programme.

The experimental group underwent plyometric training programme for 3 days per week for 8 weeks. The control group did not participate in any special training programme on strenuous physical activities apart from their day to day activities. The experimental group underwent their plyometric training programme under the instruction and supervision of the investigators.

The data were collected on selected criterion variables such as back strength and explosive power in terms of vertical distances were measured by using back lift with the dynamometer and Sergeant jump at before and after the eight weeks of step aerobic as pre and post test. Analysis of covariance (ANACOVA) was applied to find out significant difference if any between the experimental and control group.

**Table I.** Analysis of covariance for back strength and explosive power in terms of vertical distances for plyometric training group and control group

Variable Name	Group Name	Plyometric Training Group	Control Group	'F' Ratio
<b>Back Strength (in Kilograms)</b>	<b>Pre-test Mean ± S.D</b>	65.67 ± 1.55	65.93 ± 1.91	1.263
	<b>Post-test Mean ± S.D.</b>	68.13 ± 1.26	65.87 ± 1.26	32.99*
	<b>Adj. Post-test Mean ± S.D.</b>	68.56	65.23	71.39*
<b>Explosive Power (in cms)</b>	<b>Pre-test Mean ± S.D</b>	35.15 ± 1.35	34.90 ± 1.13	0.59
	<b>Post-test Mean ± S.D.</b>	39.11 ± 0.96	34.26 ± 1.91	21.89*
	<b>Adj. Post-test Mean ± S.D.</b>	39.89	34.561	43.55*

\* Significant at 0.05 level of confidence.

(The table values required for significance at 0.05 level of confidence for 1 and 18 & 1 and 17 are 4.41 and 4.45 respectively).

### Results

Table-I showed that the results of the study there was a significant difference between experimental and control group on back strength and explosive power in terms of vertical distances. Further the results of the study showed that there was a significant improvement in the performances of back strength and explosive power in terms of vertical distances due to eight weeks of plyometric training programme. However the improvement was in favour of experimental group.

### Conclusions

1. There was a significant difference between experimental and control groups on back

strength and explosive power in terms of vertical distances.

2. There was a significant improvement in the performances of back strength and explosive power in terms of vertical distances. However this improvement was in favour of experimental group due to eight weeks of plyometric training programme.

### Reference

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