



ISSN: 2456-0057
IJPNPE 2018; 3(1): 1363-1366
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www.journalofsports.com
Received: 01-11-2017
Accepted: 03-12-2017

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Effect of plyometrics on the vertical jumping ability on basketball players

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Abstract

Plyometric exercises are especially useful in sports that require speed strength. Speeds Strength is the ability to exert. To maximal force during high speed movements sport that requires speeds strength include track and field jump, throwing & sprinting; volleyball & basketball (which require maximal jumping ability.) The ability to rapidly to apply force (reactive force) is the major goal of plyometric training. Plyometric are use to apply and overload to muscles speed strength goal. Plyometric training is considered to be more effectively used to improve performance in a wide variety of sports ranging form field events to volleyball. Plyometric training include bounces, hops, jumps, that significantly improve speed, explosive strength and aerobic power (Thomas 1988). The research sample numbered 34 examinees; it is drawn from the Junior and youth age level. The basic criteria for selections: all the examinees were experienced form= 5 years. They had all been training basketball for a period of four to six years; they all Participated as competitions in the various competitions; They all had five training sessions a week during the preliminary period, and the sessions lasted from 90 to 120 minutes; They were tested at the start and at the end of the experiment; All the basketball players were physically healthy and the data on the injured players was not used in the statistical analyses. By means, the examinees were divided into an experimental group, numbering 17 basketball players, and a control group numbering 17 players.

Due to the nature of experiment, it was necessary that the data for the experimental and control group be gathered at both the initial and final measuring. For the purpose of analyzing the changes in the results for the dependent variables in the period between the initial and final measuring, the dependent sample test was used, and the relevance of the conclusions drawn was determined at the p<0.05 levels for the data collected at the final measuring, the covariance analysis was used. The data had been shown graphically, using MS Excel and further processed with the SPSS Software for Windows. Researchers to find out the improvement of jumps through statistical treatment.

Keywords: effect, plyometrics, vertical jumping, ability, basketball players

Introduction

Plyometric is a method of developing explosive power an important component of most athletic performances. From a practical point of view plyometric training is relatively easy to teach and learn and it places fewer physical demands on the body than strength or endurance training. Plyometric rapidly becoming an integral part of the overall training program in many sports.

Plyometric an advanced training technique aimed at linking strength with speed of movement to produce power. Trainers judge plyometric workouts to be more effective than weight training alone because plyometric focus not only developing strength but on velocity as well which weight training fails to do. Strength and velocity together equal power.

Plyometric exercises are especially useful in sports that require speed-strength. Speed-strength is the ability to exert maximal force during high speed movements. Sports that require speed strength include jumping in shooting and activities in basketball.

It is thought that plyometric exercise was initiated in 1970 by soviet block and eastern European coaches. But is not true because at that time the word plyometric was that much popular. This exercise was started by coaches Track and Field by keeping in mind the future prospectus. In this field Fred Wilt played important role.

The actual term "plyometric" was first coined in 1975 by Fred Wilt, one of the America's more forward thinking track and field coaches. Based on Latin origin, plyometric is interpreted

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to mean “measurable increases”. This seemingly exotic exercises were thought to be responsible for the rapid competitiveness and growing superiority of Eastern Europeans in track and field events. Plyometric rapidly became known to coaches and athletes as exercises or drills aimed at linking strength with speed of movement to produce power, plyometric training became essential to athlete who jumped, lifted or threw.

Plyometric also develop the whole neuromuscular system for power movements not merely the contractile tissue alone. By performing regular plyometric work outs neural pathways and muscle fiber recruitment are improved over time. Plyometric training has gained worldwide acceptance and credibility through scientific research.

Plyometric is a popular training technique used by many coaches today. It has been touted as a way to the bridge gap between sheer strength and power. The term plyometric can be used to describe any exercise that allows the athlete to take advantage of the stretch-shortening cycle to produce an explosive movement. Although plyometric has been around many years there is still debate on it effectiveness and safety.

In theory of strength training the specific training for the increase of explosive type strength is referred to as “plyometric training” and training method is called “plyometric method”. “plyometric is a speed-strength training a combination of strength and speed

Methodology

This chapter describes the methodology and procedure adopted for the selection of subjects, selection of variables, administration of test, collection of data and statistical technique employed for analysis of data.

Selection of subject

The purpose of the study was to examine the Vertical Jumping ability of college students. To achieve this purpose 34 male subjects from Christ College Irinjalakkuda were selected as subjects. The investigator explained to them about the purpose and nature of the study and seek the willingness of the subjects to volunteer for the study. Only male subjects aged 18-25 years were contacted and around 34 gave their volunteer consent to work as subject for the study. Only 34 of them, as plyometric exercise (N=17) and control group (N=17) were selected as subjects. The selected 34 subjects were divide in to two.

Selection of variables

Variables are the conditions or characteristics that the researcher manipulates or observe.

- Dependent variable – Vertical Jumping ability
- Independent variable – Plyometric Exercise

Experimental design

The experimental design used in this study was used the purposive random group design, in which thirty four male subjects were divided into two equal groups. Group1 (experimental group) and Group 2 (controlgroup) underwent their regular practice.

Reliability of data

The reliability of data was measured by ensuring instrument reliability and tester reliability. To ensure that the investigator was well versed with the techniques of conducting the test, the investigator had a number of practice sessions in testing procedure, under the guidance of an expert.

Orientation of the subjects

An orientation session was conducted for the selected subjects and they were given a detailed account of the whole study and test which they had to undergo.

Collection of data

After six week of training, Vertical Jumping height was measured by using JCR test respectively.

Test administration

The nature and importance of study was explained to the subjects for their optimum participation. The researcher verbally explained the Plyometric exercise to the experimental group was given six weeks of Plyometric exercise training.

The vertical jump test

- **purpose:** to measure the leg muscle power
- **The instruments:** a wooden case used in gymnastic training, thin rubber carpeting of a rough surface, a board with darkened background which has been fastened to the wall, magnesium and a steel measuring tape.
- **Directions:** The performer should stand with one side toward a wall heels together and hold a 2.54 centimetre piece of chalk in the hand nearest to the wall. Keeping the heels on the floor, he reaches upward a high possible and makes a mark on the wall. The performer then jumps as high possible and makes another mark at the height of the jump. The use of arm swing is allowed.
- **Scoring:** The number of centimetres between the reach and jump marks measured to the nearest centimetre is the score. Three trials are allowed and the best trial is recorded as the scorer.
- **Additional pointers:**
 1. A double or a crow hop should not be permitted upon take off;
 2. The chalk should not be extended more than necessary beyond the finger tips to make the standing and jumping marks.
 3. Given adequate space and trained student assistants, more than one subject can be tested at one time.
“Scoresfor the vertical jump test may be reported as the vertical distance between standing height and jumped height”.

- **Training elements**

Stretching: you might be surprised to know that it still hasn't been proven that stretching prevents injuries. The reason you should stretch is to improve your performance.

Warm up: This is a very important part of your workout. A warm muscle (high temperature, more blood flow in the muscle tissue) will stretch more effectively and will perform more effectively than a cold muscle.

Training surface: perform plyometrics only on surfaces with good shock absorbing properties, such as soft grassy areas, sand, well-padded artificial turf, and gym mats. Never do them on asphalt or gymnasium floors.

Use footwear with a good ankle and arch support, lateral stability and a wide non-slip sole.

Statistical technique

In order to find the significance of different among the pre-

test and post-test on selected variables the t-ratio was applied. To compare the significance of difference the level of significance chosen was 0.05.

**Control Group Vertical Jump
T-Test
Paired Sample Statistics**

Table 4.1.1

Control Group		Training	Mean	N	Std.Deviation	Std.Error
Pair 1	Improvement Of Vertical Jump	After	.4947	17	.0551	.0134
		Before	.4847	17	.0564	.0137

Null Hypothesis H0 = There is No significant difference between Means of Vertical Jump of After & Before training.

Alternate Hypothesis H1 = There is significant difference between Vertical Jump of After & before training.
Paired Sample Test

Table 4.1.2

Control Group	Paired Differences	T	p-Value
	Mean		
Improvement of vertical jump (After & Before training)	.0100	1.971	0.066 NS

*As p-Value>0.05 the difference between mean is Not significant (NS)

Conclusion: The Null Hypothesis H0 is accepted & Alternate Hypothesis H1 is rejected

**Experimental Group Vertical Jump
T-Test
Paired Sample Statistics**

Table 4.1.3

Control Group		Training	Mean	N	Std.Deviation	Std.Error
Pair 1	Improvement of Vertical Jump	After	.5876	17	.0885	.0215
		Before	.5241	17	.0702	.0170

Null Hypothesis H0= There is no significant difference between Means of Vertical Jump of After and before training.

between Vertical Jump Before and after training
Paired Sample Test

Alternate Hypothesis H1 = There is significant difference

Table 4.1.4

Control Group	Paired Differences	T	p-Value
	Mean		
Improvement of Vertical Jump (Before & After training)	.0635	7.198	0.0000*

*As p-Value <0.05 the difference between mean is significant

Conclusion: The Null Hypothesis H0 is rejected & Alternate Hypothesis H1 is accepted.

Summary

Plyometric exercises are especially useful in sports that require speed strength. Speeds Strength is the ability to exerts. To maximal force during high speed movements sport that requires speeds strength include track and field jump, throwing & sprinting; volleyball & basketball (which require maximal jumping ability). The ability to rapidly to apply force (reactive force) is the major goal of plyometric training. Plyometric are use to apply and overload to muscles speed strength goal. Plyometric training is considered to be more effectively used to improve performance in a wide variety of sports ranging form field events to volleyball. Plyometric training include bounces, hops, jumps, that significantly improve speed, explosive strength and aerobic power (Thomas 1988).

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Conclusion

At the initial measuring, it was necessary to determine any possible differences between the Experimental and the Control Groups. For that it was necessary to apply t-test for testing the difference between the means of the variables. Vertical Jump:- Experimental group the percent improvement

was 12.11% As compared to group it was only 2.06%. The results are also further verified by the Statistical t-test

The growth increase of the numerical values for the jumps in evident in both groups of players, but it is necessary to determine whether is a difference between the growth increase in the results of experimental and control groups. For this purpose t-test was used for testing the average difference between the growth increase.

Guided by the general principles of using a plyometric method in an experimental research on a sample consisting of cadets, individual plans for each basketball player were made. It has been proven experimentally that an six-week training model using the plyometric method can have an effect on the statistically relevant increase in the explosive type strength of the leg muscles, which in turn leads to an increase in the vertical jump. It can be pointed out that, if plyometric exercises are applied correctly and specifically, it may prove to be beneficial in a number of situations for professional athlete.

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