



RESEARCH ARTICLE

EFFECT OF PLYOMETRIC EXERCISE ON VERTICAL JUMP PERFORMANCE OF INTERS COLLEGIATE PLAYER

*Dr. K. Usha Rani

Dept. of Physical Education & Health Science, Alagappa University, Karaikudi, Sivagangai Dist. Tamilnadu, India

ARTICLE INFO

Article History:

Received 19th January, 2017

Received in revised form

14th February, 2017

Accepted 22nd March, 2017

Published online 30th April, 2017

Key words:

Plyometric exercise,
Vertical jump,
Volley ball player,
Training.

ABSTRACT

Plyometric is another type of body weight exercise that is taking on popularity among women. It is a form of exercise training designed to produce quick and powerful movements. It is a form of exercise training designed to produce quick and powerful movements. Plyometric training is a high intensity work out and only well conditioned athletes should use them as a training tool. Even then athletes should be under the supervision of a qualified coach or trainer. It is also suggested athletes check themselves for signs of injury and over training. Contractions are what cause muscles to move. The importance of plyometric revolves around the basic concept that a pre-stretched muscle is capable of generating more force. It is also proven that plyometric training mixed with strength training can result in greater gains in both. Plyometric training will bridge the gap between strength and speed. It will benefit athletes of all ages correctly. The purpose of this study was to find out the effect of plyometric exercise on vertical jump performance of inter collegiate players. To achieve this purpose of the study twenty five volleyball players and twenty five non volley ball inter collegiate players of Alagappa University College of Physical Education, Karaikudi were randomly selected as subject. The group was equated based on the initial test. The standing broad jump was used to equate the group. Each group fifteen players were selected for research. The age group of the subjects was between 22 years to 25 years. Experimental design, equated group design was used. Control group was not subjected to any treatment. Experimental group was subject to the experimental treatment At the end of six weeks of experiments, the vertical jump performance of the control and experimental groups were taken. The collected data were subjected to statistical analysis. The 't' ratio was used.

Conclusion: Based on the limitation, delimitation of the study it was concluded that plyometric exercise improves the vertical jump performance of the players.

Copyright©2017, Usha Rani. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Dr. K. Usha Rani, 2017. "Effect of plyometric exercise on vertical jump performance of inters collegiate player", *International Journal of Current Research*, 9, (04), 49634-49636.

INTRODUCTION

Many athletes and trainers use plyometric jumping exercises to build power and speed, improve coordination and agility and effectively improve sports performance. It's also important to recognize that these are high risk exercises and if performed incorrectly or performed without a solid base of training, plyometrics can increase the risk of injury. To tremendous force generated during these moves requires that athletes use them sparingly and with proper training. The most important aspect of a safe and effective plyometric program is developing a safe landing technique. Plyometrics is another type of body weight exercise that is taking on popularity among women. It is a form of exercise training designed to produce quick and powerful movements. Plyometric training is a high intensity work out and only well conditioned athletes

should use them as a training tool. Even then athletes should be under the supervision of a qualified coach or trainer. It is also suggested athletes check themselves for signs of injury and over training. Contractions are what cause muscles to move. Athletes have observed after an eccentric their muscle contractions are much more powerful. The main focus of plyometrics training is to shorten the time between stretching and contracting muscles. The exercises required take the form of explosive work outs such as jumps and bounds which in turn cultivate explosive bursts of speed and power. Plyometric training is stretching muscles while they are contracting, teaching them to have an explosive contraction after the muscles are stretched. Using plyometric increases gains in power. The importance of plyometrics revolves around the basic concept that a pre-stretched muscle is capable of generating more force. It is also proven that plyometric training mixed with strength training can result in greater gains in both. Plyometric training will bridge the gap between

*Corresponding author: Dr. K. Usha Rani,

Dept. of Physical Education & Health Science, Alagappa University, Karaikudi, Sivagangai Dist. Tamilnadu, India.

strength and speed. It will benefit athletes of all lone correctly. Mathews says, "Strength is basic to performance in activity"

MATERIALS AND METHODS

Review of Relevant Literature

Fowler (2003), *et al*, The effectiveness of a pendulum swing for the development of leg strength and counter-movement jump performance. Various training devices have been developed to facilitate plyometric training, one such device being the 'pendulum swing'. To assess the effectiveness of the pendulum swing, the results of a 3 week training programme using a combination of pendulum swing and weight-training exercises were compared to those of a weight-training programme. Subjects were 5signed to one of two groups (n = 9) for weight-training only or for combined pendulum and weight-training Both groups performed the same number of exercise repetitions Measurements of isometric knee and hip extension-flexion, 1- PM squat weight, maximum jump height and power for a counter-movement jump were taken pre-training, 2 days after the end of the programme and 2 weeks after the end of the programme The data were analyzed using two-way MANOVA and MANCOVA techniques Both methods showed significant ($P < 0.05$) increases in knee and hip extension strength Hip and knee flexion strength increased only for the weight-trained group. Counter-movement jump height increased for both groups (weight-trained, $P < 0.05$; combined, $P < 0.01$). Maximum power increased only for the combined group ($P < 0.05$). When the pre-training scores were used as a covariate, the weight-trained group showed a greater increase in hip flexion and extension strength and knee flexion strength than the combined training group ($P < 0.05$). The combined group showed the greatest increase in knee extensor strength. It is concluded that the pendulum system induces a training effect which could be used to supplement weight-training for improving vertical jump performance.

Objectives

Vertical jumping is of considerable importance in numerous sports and games. The player's ability to jump higher and quicker is important keys to successful performance. Plyometric training is a new technique of training which is based on specificity principle. In this study, the researcher was trying to estimate the effect of plyometric training on the vertical jumping ability of high school volleyball players.

Hypothesis

It was hypothesis that the plyometric exercise improve the vertical jump of the inter collegiate players.

Methods

The purpose of this study was to find out the effect of plyometric exercise on vertical jump petrformance of inter collegiate players. To achieve this purpose of the study twenty five volleyball players and twenty five non volley ball inter collegiate players of Alagappa University College of Physical Education, Karaikudi were randomly selected as subject. The group was equated based on the initial test. The standing broad jump was used to equate the group. Each group fifteen players were selected for research. The age group of the subjects was between 22 years to 25 years. Experimental design, equated

group design was used. Control group was not subjected to any treatment. Experimental group was subject to the experimental treatment the following eight exercises, 1. Jump to box 2. Single leg lateral hops, 3. Truck jump 4. Baox & rill with rings 5. Lateral jump to box 6. Boundary with ring 7. Lateral handle jump 8. Depth jump were for six weeks three days in a week in the order Monday, Wednesday and Friday. In each day the plyometric group performed three sets of ten repetitions, with an interval and rest period of two minutes. Every day before starting the practice, the subjects took usual warming up. The subjects performed the depth jumping in the presence of the investigator. At the end of six weeks of experiments, the vertical jump performance of the control and experimental groups were taken. The collected data were subjected to statistical analysis. The 't' ratio was used. The t-ratio was calculated to find out the difference between the two groups. To calculate the 't' ratio the formula suggested by Clarke and Clarke was used

Test-vertical jump

The subjects were taught the technique of vertical jumping by the research with proper demonstration and explanation. The subjects were given sufficient time for practice. While conducting the test, the subject was asked to stand close facing the board with hands fully extended and heels touching the ground. The top of the fingers in this position was marked. Then the subject was asked to turn to one side and then a crouched position leap vertically making a mark on the board at maximum height. Before jumping the subject had to chalk his fingers. This distance between the top of the fingers when the subject standing on the floor with fully extended hands at the top of the fingers at the height of the jump was taken as the measurement. The best of three consecutive jumps was recorded to the nearest half centimeter.

1. Before jumping, they were asked approximately to ninety degree at the hip.
2. While jumping the subjects were asked to take off from both the feet.
3. While taking the standing height, the subjects were asked to stand close facing the board.
4. The tester was standing on a table on the right side of the board so that he could see clearly the exact marking.

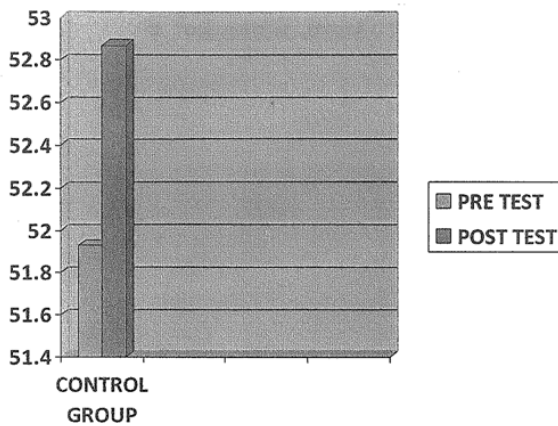
Table 1. Computation of t – Ratio between control group and experimental group

Groups	Pre Test Mean	Post Test Mean	Difference between Means	Mean Gain	't' ration
Control Group	51.93	52.87	0.94	7.47	3.14*
Experimental Group	51.93	60.07	8.41		

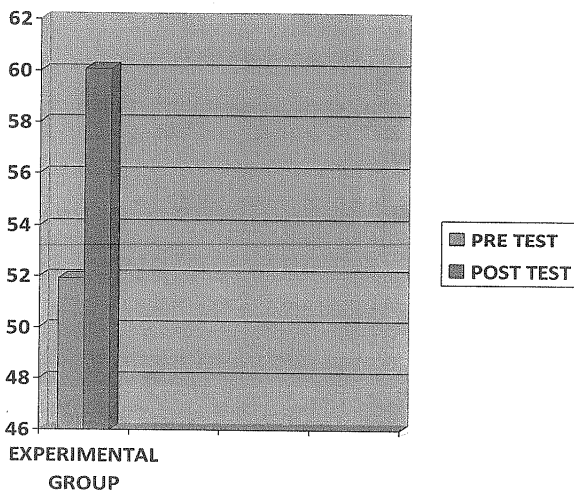
*Significant at 0.05 levels of confidence with the Degrees of freedom 28. The table 't' 2.05.

The Table-1 shows the pre test mean of experimental group and control group 51.93, 51.93 respectively. The post test means of the experimental group and control group 60.07, 52.87 respectively. The obtained 't' value 3.14 is significant at 0.05 level of confidence with the degree of freedom 28. The table 't' value is 2.05. Hence the hypothesis was accepted

The bar Diagram-1 shows the Pre and Post test of Control group in vertical jump.

Diagram-1**The mean value of control group pre and post test on vertical jump**

The bar diagram-2 shows the Pre and Post test Mean of Experimental group in vertical jump.

Diagram-2**The mean value of experimental group pre and post test on vertical jump****Conclusion**

Based on the limitation, delimitation of the study it was concluded that plyometric exercise improves the vertical jump performance of the players. The below study is support the researcher. According to Bunn, The value of building strength is found in experimental with the sergeant jump. It was found

that the effective angle that a muscle operates is dependent on the strength of the muscles. In the sergeant jump the stronger the muscle, the greater the crouch to obtain the greatest height in the jump. In plyometric training the muscle contracts eccentrically immediately prior to a powerful concentric contraction. This study was supported by Menzel HJ, Chages MH, szmuchrowski LA, Araujo SR, Campos CE, Giannetti MR Usefulness of the hump and reach test in assessment of vertical jump performance. Percept Most skills. The objective was to estimate the reliability and criterion related validity of the jump and Reach test for the assessment of squat, countermovement, and drop jump performance of 32 male Brazilian professional volleyball players. Performance of squat, countermovement, and drop jumps with different dropping heights was assessed on the jump and reach test and the measurement of flight time, and then compared across different jump trials. The very high reliability coefficients of both assessment methods and the lower correlation coefficients between scores on the assessments indicate a very high consistency of each method but only moderate conveyation which means that they measure partly different items. As a consequence, the Jump-and- reach test has good ecological validity in situations when reaching height during the flight phase is critical for performance (e.g. basketball and volleyball) but only limited accuracy for the assessment of vertical impulse production with different jump techniques and conditions.

Suggestion

1. The plyometric exercise must include in the training program.
2. The plyometric training improves the leg explosive power so it should be practiced according to the event or game.
3. The use of proper technique during the practice session of plyometric exercise may avoid injuries.
4. The plyometric exercise influences the performance of various jumps related event or sports. Example high jump, long jump, volley ball, basketball etc...

REFERENCES

- Donald K. Mathes, Measurement in Physical Education (Philadelphia: W.B. Saunders Company, 1968,) P.
- Fowler NE, Trzaskoma Z, Wit A, Iskra L, Lees A. PMID: 7595979 [PubMed - indexed for MEDLINE] *J Strength Cond. Res.*, 2003 Nov; 17(4):704-9.
- John W. Bunn, Scientific Principle of Coaching (Englewo Clifs, New Jersey: Prentice Hall Inc., 1972), P. 101.
- Luebbbers PE, Potteiger JA, Hulver MW, Thyfault JP, Carper MJ, Lockwood RH. PMID: 14636088 [PubMed - indexed for MEDLINE] *Int J Sports Med.*, 2004 Jul; 25(5):391-8.
