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Effect of Upper and Lower Limb Plyometric Training on Performance Variables of Basketball Players

Dr.S.Chidambara Raja

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

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Abstract

The purpose of the present study was to find the effect of upper and lower limb plyometric training on performance variables of female college basketball players. For this purpose, twenty basketball players studying in various courses and departments of Annamalai University with the age group of 19 – 25 years were selected as subjects. They were divided into two equal groups, each group consisted of ten subjects, in which group – I underwent upper and lower limb plyometric training and group – II acted as control that did not participate in any special activities apart from their regular curricular and basketball related activities. The training period for this study was three days (alternative days) per week for eight weeks. Prior to and after the training period, the subjects were tested for passing, dribbling and shooting in basketball by administering Johnson Basketball ability test. The Analysis of Covariance (ANCOVA) was used as statistical tool to find out any significant difference that was exist between the upper and lower limb plyometric training group and control group on selected criterion variables, such as, field goal speed test, basketball throw for accuracy and dribble. The result of the study shows that upper and lower limb plyometric training group has improved the basketball playing ability significantly (P > .05) when compared with the control group. It was concluded from the result of the study that the basketball players those who were undergone the upper and lower limb plyometric training has improved their basketball playing ability significantly when compared with the basketball players those who were in control group.

Keywords: Upper and Lower Limb Plyometric Training, Basketball, Passing, Dribbling, Shooting.

Introduction

Training is a systematic process of repetitive progressive exercise of work involving, learning and acclimatization. (C.E. Kalf & D.D. Arnheim, 1983). In sports the word "Training" is generally understood to be a synonym of doing physical exercises. In a narrow sense, training is doing physical exercises for the improvement of performance. (Hardhayal Singh, 1993). Sports training is a scientifically based and pedagogically organized process which through planned and systematic effect on performance ability and performance readiness aims at sports perfection and performance improvement as well as at the contest in sports competition. Plyometric training enhances the tolerance of the muscle for increased stretch loads. This increased tolerance develops efficiency in the stretch shortening cycle of muscle action. During the stretching (eccentric lengthening phase) of muscle action a greater amount of elastic energy is stored in the muscle.

Correspondence
Dr. R.Chidambara Raja,
Annamalai University
E-mail: rajadi42@gmail.com, Ph. 094435 40215

Plyometrics include trouncing, jumping and a depth jumping exercises. The principle applies to any activity where the body is falling and the kinetic energy developed by the loaded muscle is utilized. Plyometric - concentric contractions while involving strength reflex, found in depth jumping and other bounding activities. The upper body plyometric drills allow maximum power to be generated because, unlike barbells or dumbbells, the medicine ball can be released into the air.

For that first game of basketball in 1891, Naismith used as goals two half-bushel peach baskets, which gave the sport its name. The students were enthusiastic. After much running and shooting, William R. Chase made a midcourt shot—the only score in that historic contest. Word spread about the newly invented game, and numerous associations wrote Naismith for a copy of the rules, which were published in the January 15, 1892, issue of the *Triangle*, the YMCA Training School's campus paper. While basketball is competitively a winter sport, it is played on a 12-month basis—on summer playgrounds, in municipal, industrial, and church halls, in schoolyards and family driveways, and in summer camps—often on an informal basis between two or more contestants.

Plyometric training is an excellent way to train for the demands of basketball. Training programs should include repeated high intensity work, followed by periods of recovery that mimic the specific tasks associated with basketball. Plyometric drills should be progressive in nature and extend through the preparatory and preseason cycles of training. In season plyometric training is often too much for players who are maintaining a full schedule of two to four games per week. (Chu, 2013)

Methods

In this study it was to find out the effect of upper and lower limb plyometric training on performance variables of college basketball players. To achieve the purpose twenty female basketball players studying in various classes in the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects. They were divided into two equal groups of ten each and further divided as on plyometric training group and one control group, in which group - I (n=10) underwent plyometric training for three days (alternative days) per week for eight weeks and the group - II (n=10) acted as control who did not participate any special training apart from the regular basketball practice.

For every training programme there would be a change in game skills. So, the researchers consulted with the experts, then selected the Johnson Basketball Ability Test consists of the following: 1. field goal speed test, 2. basketball throw for accuracy and 3. dribble test.

Results and Discussion

Analysis of covariance was used to determine the differences, if any, among the adjusted post test means on selected criterion variables separately. The level of significance was fixed at .05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

Table 1. Analysis of Covariance and 'F' ratio for Passing Dribbling and Shooting Ability of Plyometric Training Group and Control Group

Variable Name	Values	Plyometric Group	Control Group	'F' Ratio
Field Goal Speed Test (Points/30 seconds)	**Pre-test Mean ± S.D**	15.11 ± 0.889	14.51± 0.9315	0.716
	Post-test Mean ± S.D.	18.15 ± 0.1136	14.87 ± 1.0003	7.1238*
	Adj. Post-test Mean	18.237	14.632	14.553*
Throw for Accuracy (Points/10 trials)	**Pre-test Mean ± S.D**	15.41± 1.083	14.86 ± 0.876	0.996
	Post-test Mean ± S.D.	18.212 ± 1.026	14.99 ± 0.223	9.123*
	Adj. Post-test Mean	18.3673	15.01282	41.236*
Dribble (Points/30 seconds)	**Pre-test Mean ± S.D**	10.897 ± 0.454	9.863 ± 0.1136	0.069
	Post-test Mean ± S.D.	12.23 ± 0.0897	9.973 ± 0.2356	7.364*
	Adj. Post-test Mean	12.368	9.833	12.367*

* Significant at .05 level of confidence. (The table value required for significance at .05 level with df 1 and 18 and 1 and 17 are 4.41 and 4.45 respectively).

The result of the study shows that there was a significant improvement on selected criterion variables such as, field goal speed test (P>0.05, 14.553), throw for accuracy (P>0.05, 41.236) and dribble test (P > .05, 1,17) in favor of plyometric training group (Aman Singh & Abhinav, 2012, and Komal & Nandalal Singh, 2013). However the improvement was in favour of experimental group. The result of the study also shows that there was a significant difference between plyometric training group and control group on all the criterion variables.

Conclusions

There was a significant improvement in Johnson Basketball Ability test after eight weeks of upper and lower limb plyometric training when

compared with the control group.

There was a significant difference between the upper and lower limb plyometric training group when compared with the control group.

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