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Effects of plyometric training with ladder training on leg explosive power and abdominal strength endurance on inter collegiate women basketball players

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Abstract

In mandate to measure the real facts the detective made an attempt to inspect the effect of plyometric training with ladder training on leg explosive power and abdominal strength endurance of inter collegiate volleyball players. To achieve the purpose of the study 30 Subjects from Coimbatore district. Their age ranged from 18 to 23 years. The subjects were randomly assigned to three equal groups. Group- I (n=15) underwent plyometric training group (PTG) and Group - II (n=15) acted as control group (CG). The plyometric training with ladder training was given to the experimental group for the periods of 8 weeks. The control group was not given any sort of training except their routine work. The following variables were measured with standard test items: arm explosive power and abdominal strength endurance. Pre and post test was conducted on separate days with warmup. The leg explosive power assessed by standing broad jump test with unit of measurements in centimeters and abdominal strength endurance assessed by modified sit-ups test with unit of measurement in points. The data collected from the subjects were statistically analyzed using 't' test to find out whether significant mean difference existed at 0.05 level of confidence. This study may help trainers to assess the applicability of plyometric training with ladder training to improve leg explosive power and abdominal strength endurance one of the most important factors determining the inter collegiate volleyball players. Further, the findings confirmed the plyometric training and combination of plyometric training is suitable protocol to bring out the desirable changes over leg explosive power and abdominal strength endurance of inter collegiate basketball players.

Keywords: Plyometric training, combination of plyometric training, leg explosive power and abdominal strength endurance and inter collegiate basketball players

Introduction

Plyometric exercises are used to develop explosive power. In plyometric exercise, overload is applied to skeletal muscle in a manner that rapidly stretches the muscle (an eccentric or stretch phase) immediately prior to the concentric or shortening phase of action. It is this "pre stretch" that activates the muscles natural elastic recoil elements. Research has indicated that with plyometric training, greater power will be produced if the depth and rate of the movement is short and rapid rather than large and slow. This means that bounding/jumping should be done quickly and depth jump heights should not be too large. With plyometric exercise similar rules to weight training apply. Generally, up to ten reps can be done per exercise with 2-4 sets of each. Rests should allow quality to be maintained and technique is very important. A sound base of strength is required to perform more difficult exercises safely. Plyometrics or jump training volleyball exercises should be done quickly with the purpose of training muscles to be more powerful. The purpose of jump training is to train the muscles to pre-stretch before jumping. During this pre-stretch, energy is stored in the muscle which can be used to jump higher. For example, when performing a counter movement prior to jumping, elastic energy is stored in the muscles of the legs. If the counter movement is performed quickly, the energy that's stored can be used to aid in jumping higher. If the counter movement is performed too slowly, the energy will be lost. The intensity of volleyball exercises or jumping drills refers to how much stress is placed on muscles, connective tissues, and joints. Basketball players will simply leave their arms down to the side which will not help increase jump height for spiking and blocking. The double arm swing is really important.

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The proper shuffle with the bands should have feet wide and never touch. Similar to a basketball shuffle volleyball players must not cross their feet because it may cause them to fall. When basketball players are shuffling they need to be conscious not to let the knees shift in front of the toes. In the squatted position volleyball players, or any athlete for that matter, must be sure to keep the body's forces shifting in their hips and not their knees. Plyometrics exercises are great for increasing basketball player's vertical jumps for spiking and jumping. (Scholich, 1999) [10].

Experimental Approach to the Problem

In order to address the hypothesis presented herein, we selected 30 inter collegiate women basketball players from Coimbatore District. Their age ranged from 18 to 23 years. The subjects were randomly assigned in to three equal groups namely, plyometric training Group - I (n=15) (PTG) and Group - II (n=15) underwent Control Group. The respective training was given to the experimental group the 5 days per weeks for the training period of eight weeks. The control

group was not given any sort of training except their routine.

Design

The evaluated parameters were the leg explosive power assessed by standing broad jump test with unit of measurements in meters and abdominal strength endurance assessed by modified sit-ups test with unit of measurement in points. The parameters were measured at baseline and after 8 weeks of plyometric training with ladder training were examined. The intensity was increased once in two weeks based on the variation of the exercises.

Training Programme

The training programme was experimental group I underwent plyometric with ladder training for the period of 8 weeks. The training was given 3 days per week during morning time. Each training session lasted for 45 minutes that included 5 minutes warm-up and 5 minutes warm down. The load was increased from low intensity to high intensity as mentioned in the training schedule.

Table 1: Computation of 'T' Ratio on Leg Explosive Power on Experimental Group and Control Group (Scores In Numbers)

Groups	Pre-Test	Post-Test	SD	"T" Ratio
Plyometric with Ladder Training Group	2.31	2.68	0.33	7.84*
Control Group	2.10	2.12	1.17	0.94

*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table 1 reveals the computation of mean, standard deviation and 't' ratio on selected variables namely arm explosive power of plyometric with ladder training group. The obtained 't' ratio on leg explosive power were 7.84 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant.

Further the computation of mean, standard deviation and 't' ratio on selected variables parameters namely leg explosive power of control group. The obtained 't' ratio on leg explosive power were 0.94 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.

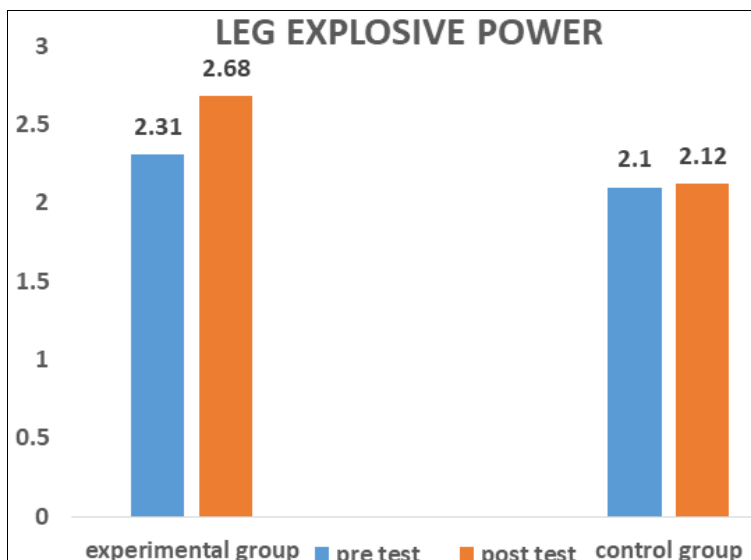


Fig 1: Bar Diagram Showing the Mean Value on Leg Explosive Power on Experimental Group and Control Group (Scores in Numbers)

Table 2: Computation of 'T' Ratio on Abdominal Strength Endurance on Experimental Group and Control Group (Scores in Numbers)

Groups	Pre Test	Post Test	SD	"T" Ratio
Plyometric with Ladder Training Group	41.55	48.20	8.20	7.91*
Control Group	41.10	39.20	1.53	0.95

*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table 2 reveals the computation of mean, standard deviation and 't' ratio on selected variables namely abdominal strength

endurance of plyometric with ladder training group. The obtained 't' ratio on abdominal strength endurance were 4.25

and 7.91 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant.

Further the computation of mean, standard deviation and 't' ratio on selected variables parameters namely abdominal

strength endurance of control group. The obtained 't' ratio on abdominal strength endurance were 0.95 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.

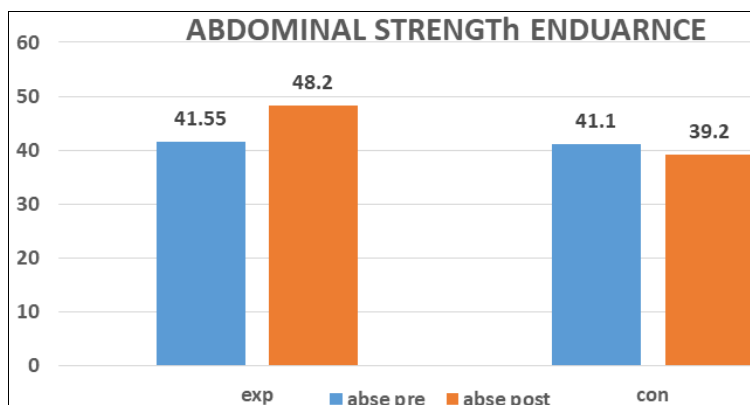


Fig 2: Bar Diagram Showing the Mean Value on Abdominal Strength Endurance on Experimental Group and Control Group (Scores in Numbers)

Discussion and Findings

The present study experimented the influence of eight weeks plyometric with ladder training on the selected parameters of the inter collegiate women basketball players. The results of this study indicated that plyometric with ladder training is more efficient to bring out desirable changes over the leg explosive power and abdominal strength endurance of the inter collegiate women basketball players. Perrier *et al.*, (2008) [16] reported that Athletes in sports requiring lower-extremity power should use stretching techniques in warm-up to enhance flexibility while improving performance. Pacheco *et al.*, (2011) [17] suggest that static active stretching in AT can be recommended during the warm-up for explosive force disciplines. Khelifa *et al.*, (2002) [18] indicated that standard plyometric training program may result in greater vertical and horizontal-jump performances in basketball players. French *et al.*, (2006) [19] suggested that plyometrics are worthwhile training activities for improving power and agility in youth soccer players. Chatzinikolaou *et al.*, (2010) [20] revealed that plyometric exercises training sessions. Improving repeated sprint ability in young elite soccer players: repeated shuttle sprints vs. explosive strength training.

This review shows there is a lack of proposals of tools to support these basketball players during their training. Therefore, this encourages us to participate actively in the generation of interactive systems which address the skill development needs motivating and engaging context. Hence, it concluded that for leg explosive power and abdominal strength endurance changes of inter collegiate women basketball players.

Conclusion

From the results of the study and discussion the following conclusions were drawn.

Based on the result of the study it was concluded that the 8 weeks training of plyometric with ladder training have been significantly changes on leg explosive power and abdominal strength endurance changes of inter collegiate women basketball players.

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