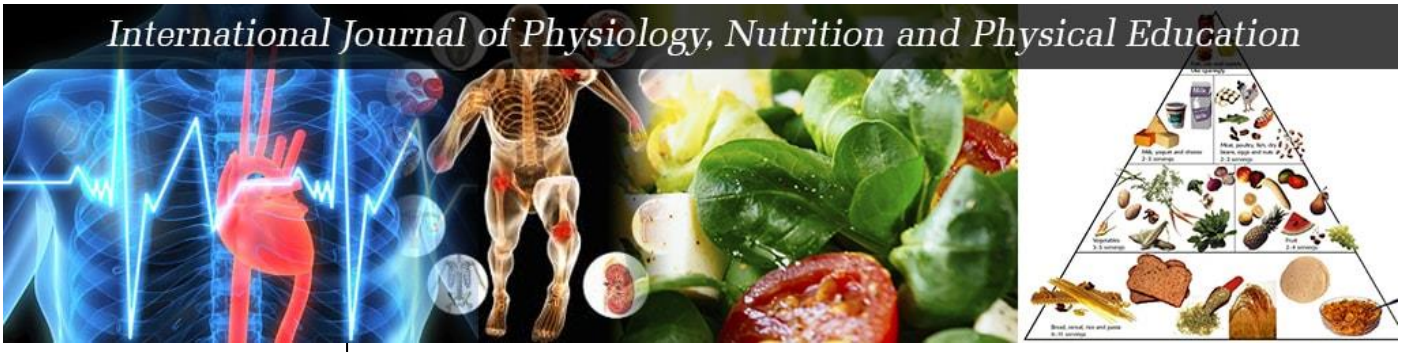

ISSN: 2456-0057
IJPNPE 2019; 4(1): 1725-1728

www.journalofsports.com
Received: 01-11-2018
Accepted: 03-12-2018

Vivek R
PhD Research Scholar, Department of Physical Education & Sports, Pondicherry University, Pondicherry, Tamil Nadu, India

Dr. R Ram Mohan Singh
Assistant Professor Department of Physical Education & Sports, Pondicherry University, Pondicherry, Tamil Nadu, India

Correspondence
Vivek R
PhD Research Scholar, Department of Physical Education & Sports, Pondicherry University, Pondicherry, Tamil Nadu, India

Effect of plyometric training on explosive strength of volleyball players

Vivek R and Dr. R Ram Mohan Singh

Abstract
The purpose of the study was to identify the effect of Plyometric training on explosive strength of volleyball players. Plyometrics is also known as jumping training. It is a training technique designed to improve muscular power and explosiveness. For this purpose thirty players were randomly selected from the Spider Volleyball Club in Puducherry and their age ranged from 14-18 years. The selected subjects were randomly assigned to experimental group A and control group B. Each group consisted of 15 subjects each. Group A acted as experimental group and were subjected to trained for six weeks and group B acted as control group. The variables selected for this study was upper body explosive strength and lower body explosive strength. The testing tool used for measuring upper body explosive strength was 2kg medicine ball throw and for lower body explosive strength standing broad jump test was administered. The results of pre and post-test were statistically treated by using ANOVA.

Keywords: Plyometrics, muscular power, explosive strength, volleyball players

Introduction
The term "plyometrics" came into being in the late 1970s in the United States thanks to the work of Fred Wilt (1920-1994), a long-distance runner and member of the U.S. Olympic Team in 1948 and 1952. After his retirement from racing, Wilt became the coach of the women's running team at Purdue University. His greatest merit was to have popularized in the United States the "jump training" method of the coaches from the Soviet Union, thus coining the term "plyometrics." Plyometrics (“plyo,” for short) used to be called “jump training.” It’s a technique that can be used in many different ways. For instance, you can do plyometrics to help train for basketball, volleyball, tennis, or any other activity that incorporates explosive movements. The physical demands of an athlete differ greatly from a ‘normal person who exercises in a gymnasium looking to build huge muscles. Explosiveness–a combination of muscle power and strength – is what an athlete needs to work on rather than ‘slow-repetition’ bodybuilding exercises such as bench press or bicep curls. This is where Plyometric exercises come in handy. Plyometric exercises are moves associated with a power component – so, if you were to do a ‘clap press-up’ that would be a Plyometric move as opposed to a traditional press-up. Likewise, jump squats are Plyometric compared to normal squats. The three key benefits of Plyometric training are increased muscular power, injury prevention, and boost high speed abilities like sprinting or jumping.
The physiological character of Volleyball is determined by the specific offensive and defensive performance of the players such as jumps to spike, leaps in different directions or sprints to the ball for distances up to 10 meters. All these techniques require strength and speed that predominantly depend on the energy generated through anaerobic pathways. During the match, a Volleyball player performs over 100 jumps in any of the four elements: attack, block, serve or playing the ball. The number of jumps differs according to the player’s role and his specialization. However, the technique of jumping strongly depends on the rules of the game, which are often changed. Nowadays, the high-power jumps, performed especially during attacks, are most preferable. Therefore, exercises developing the ability to jump high in players (for example plyometric exercises) are the crucial element of a training program. This occurs as an effect of the reduction in the time required for the switch from a stretch to contraction.

Conditioning for plyometrics

Higher-than-normal forces are put on the musculoskeletal system during plyometric exercises so it is important for the athlete to have a good sound base of general strength and endurance. Most experts state that a thorough weight-training is essential before you start plyometrics. It is advisable that one should start an intense plyometrics workout without proper preparation beforehand.

However, less intensive plyometric exercises can be incorporated into general circuit and weight training during the early stages of training so as to progressively condition the athlete. Simple plyometric drills such as skipping, hopping and bounding should be introduced first. More demanding exercises such as flying start single-leg hops and depth jumps should be limited to thoroughly-conditioned athletes.

Plyometrics

Plyometrics is a method of developing explosive power. It is also an important component of most athletic performances. As coaches and athletes have recognized the improvements plyometrics can bring to performance, they have integrated it into overall training programs in many sports and made it a significant factor in planning the scope of athletic development-JAMES RADCLIFFE.

Muscular power

The ability to exert a maximal force in a short time as possible as in accelerating, jumping and throwing implements. While strength is the maximal force you can apply against a load, power is proportional to the speed at which you can apply this maximal force-To pend Sports.

Explosive strength

Explosive strength is the quality of strength produced very quickly, but not necessarily relating to speed of movement. Explosive strength is the ability to reach absolute peak force as fast as possible. With power you are aiming to reach whatever force is required for the task at hand and do so quickly throughout the range of a given movement. Explosive strength is about generating absolute peak force, the maximum amount of force one is capable of, at a rapid pace-

Statement of the problem

The purpose of the study was to identify the effect of plyometric training on explosive strength of volleyball players.

Hypothesis

It was hypothesised that there would be significant improvement on explosive strength of volleyball players due to the influence of Plyometric training of volleyball players.

Delimitations

1. The study was confined to 30 players from Spider Volleyball Club in Puducherry.
2. The age of the subjects ranged from 14-18 years.
3. The training was restricted to six weeks of plyometric activities.
4. The dependent variables were upper body explosive strength and lower body explosive strength.
5. Only players with minimum three years training were considered.

Limitations

1. In this study the possible effect of the diet, sleep, climate and habits of the subjects were ignored.
2. Socio economic background of the subjects was not taken into consideration.
3. Hereditary factors which may have some influence the result of this study could not be controlled.

Significance of the study

1. This study may help the players to improve the performance in volleyball
2. This study will help to develop the volleyball skills.
3. This study will help to improve the fitness of the subjects.
4. Improved fitness level will indirectly help subjects to avoid injuries.
5. It will help them to gain better knowledge about their training programme.

Methodology

Selection of subjects

For this study 30 subjects were selected from Spider Volleyball Club from Puducherry. Their age ranged from 14 to18 years. The subjects were randomly assigned to two groups of 15 subjects each. Group 'A' was the Experimental and group 'B' as Control group.

Selection of variables

The variables selected for this study were

1. Upper body explosive strength
2. Lower body explosive strength

Testing procedure

1. Medicine ball throws to evaluate.
2. Standing broad jumps to evaluate.

Statistical Technique

Analysis of Variance was used to examine the collected data from the two groups before and after training program. The level of significance was fixed at 0.05. The statistical technique for this study was carried out using the SPSS software.

Analysis of data and results of the study

In this study influence of independent variables namely plyometric upper body and lower body explosive strength was investigated. To identify the changes in the selected criterion variables, analysis of variance (ANOVA) was applied on each criterion variables.

Analysis of variance was used to analysis the collected data. The obtained scores in pre and post-test of the control and experimental groups have been presented in tables.

Table 1: Analysis of variance for the control and experimental groups on Medicine ball throw

	Control group	Experimental group	SOV	SS	DF	M. SQ	F-ratio
Pre-test Mean S.D±	8.40 0.33	8.40 0.27	B W	0.00 2.58	1 28	0.00 0.92	0.00
Post-test Mean S.D±	8.39 0.31	8.93 0.21	B W	2.15 1.98	1 28	2.15 0.71	30.45*

*Significant at 0.05 level of confidence

The table value required for significant at 0.05 level of confidence with DF 1 and 28 was 4.20

Table 1 shows that the pre-test means on medicine ball throw of the control and experimental groups are 8.40 and 8.40. The obtained F ratio value is 0.00 for the pre-test mean is lesser than the required table value 4.20 for significance at 0.05 level. Hence it is not significant and it reveals that there is no significance difference between the control and experimental groups on medicine ball throw before the commencement of experimental training.

Post-test means on medicine ball throw of the control and experimental groups are 8.39 and 8.93. The obtained F ratio value 30.45 for the post-test mean is greater than the required table value 4.20 for the significance at 0.05 level. Hence it is significant and it reveals that there is a significant difference between the control and experimental groups on medicine ball throw after experimental training.

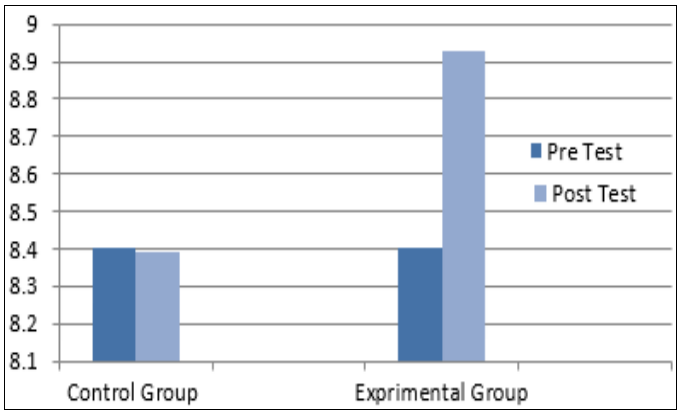

Fig 1: Medicine ball throws in meter

Table 2: Analysis of variance for the control and experimental groups on Standing Broad Jump

	Control Group	Experimental Group	SOV	SS	DF	M. SQ	f- ratio
Pre-test mean S.D±	2.37 0.18	2.35 0.21	B W	0.11 1.09	1 28	0.11 0.04	2.797
Post-test mean S.D±	2.25 0.17	2.50 0.20	B W	0.16 0.93	1 28	0.16 0.03	4.858*

*significant at 0.05 level of confidence

The table value required for significance at 0.05 level of confidence with DF 1 and 28 was 4.20

The table 2 shows that the pre-test mean on standing broad jump of the control and experimental group.

The table 2 shows that the pre-test means on standing broad jump of control and experimental groups are 2.37 and 2.35. The obtained F ratio value is 2.797 for the pre-test mean lesser than the required table value 4.20 for significance at 0.05 level. Hence it is not significant and it reveals that there is no significance difference between the control and experimental groups on standing broad jump before the commencement of experimental training.

The pre-test means on standing broad jump of control and experimental groups are 2.25 and 2.50. The obtained F ratio value 4.858 for the post-test mean is greater than the required table value 4.20 for significance at 0.05 level. Hence it is not significant and it reveals that there is a significance difference between the control and experimental groups on standing broad jump before the commencement of experimental training.

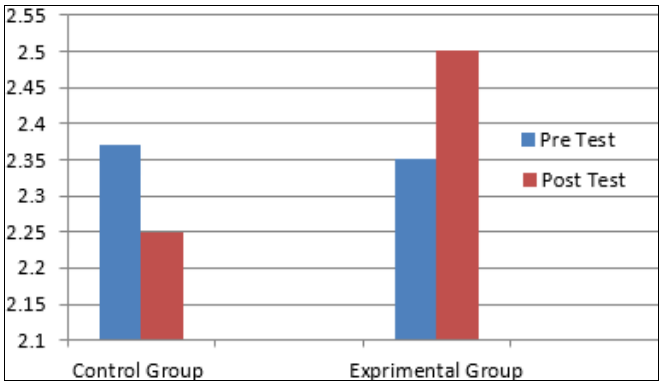

Fig 2: Standing broad jump in meters

Discussion

The purpose of the present study was to analyse the effect of six weeks plyometric training program of volleyball players of Puducherry. The study reveals that there was a significant difference on explosive power in experimental group than the control group after six weeks of plyometric training as expected in the hypothesis. The present results have supported the findings of several researchers who have found that the explosive strength in general can be improved by plyometric jump. Adam, T.M (1984) [1] plyometric training exercises on muscular leg strength and power. Blanter, S.R. Noble (1979) [3] isokinetic and plyometric training on vertical jumping performance. Paul E LUEBBERS (2003) [4] training and recovery on vertical jump performance and anaerobic power. THOMAS, K *et al* (2009) [8]. Muscular power and agility in youth soccer players.

Conclusion

On the basis of this study, the conclusion was drawn. The study concluded that there was a significant improvement in experimental group than control group in upper and lower body explosive strength. The study also helps to improve the performance and develop the volleyball skills. The subjects even improved their fitness. The subjects could avoid injuries due to improved fitness and showed more awareness about their training programme.

References

1. Adams TM. An investigation of plyometric training exercise on muscular strength, 1984.
2. James Radcliff, Robert Farentinous C. Human kinetics; high-powered plyometrics, 1958. ISSBN: 987-1-4504-9813-5
3. Blattner SE, Noble C. Relative effects of isokinetic and plyometric training on vertical jumping performance; Research Quarterly, 1979; 583-588.
4. Luebbers PE *et al*. Effect of plyometric training on recovery on vertical jump performance and anaerobic power. The journal of strength and conditioning research. 2003; 17(4):704-709.
5. Markovic G. Does plyometric training improve vertical jump height? A meta-analytical review. British journal of

sports medicine. 2007; 41(6):349-355.
6. Markovic G, Jukic. Effect of sprint and plyometric training on muscle function and athlete performance. The journal of strength & conditioning research. 2007; 21(2):543-549.
7. Matavulj D *et al*. Effects of plyometric training on jumping performance in junior basketball players. Journal of sports medicine and physical fitness. 2001; 41(2):159.
8. Thomas K *et al*. The effect of two plyometric training techniques on muscular power and agility in youth soccer players. The journal of strength and conditioning research. 2009; 23(1):332-335.
9. www.topendsports.com/fitness/power.htm
10. http://www.endlesshumanpotential.com/explosive-strength.html