IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

COMBINED EFFECT OF PLYOMETRICS TRAINING ASSOCIATED WITH SPECIFIC SKILL TRAINING ON VERTICAL EXPLOSIVE POWER AND SPEED AMONG VOLLEYBALL PLAYERS

[1]SHUNMUGA PRABHA, T., & [2]Dr. P. SIVAGNANAM

[1]Ph.D Research Scholar & [2]Director of Physical Education

[1]Department of Physical Education and Sports, Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli, Tamilnadu, India

[2]V. O. Chidambaram College, Thoothukudi, Tamilnadu, India

ABSTRACT: The purpose of this study was to look at how volleyball players' vertical explosive power and speed were affected by plyometric and specialized skill training. Twenty-four female volleyball players, ages 18 to 23, from Thoothukudi City were chosen at random to serve as the subjects. Two groups of participants were formed: Group II was the control group (CG), and Group I received plyometric training in addition to specific skill training (PMTASST). For eight weeks, the experimental group participated in evening sessions of a structured training program five days a week (Monday through Friday). Vertical explosive power and speed were the dependent variables in this study, and plyometric training combined with specific skill training (PMTASST) was the independent variable. These were evaluated using established test procedures: the 50-meter run (in seconds) was used to gauge speed, and the vertical leap test (in cm) was used to quantify vertical explosive force.A randomized design was used for both the pre-test and post-test. Each participant's data was gathered both before and after the training session, and paired sample t-tests and analysis of covariance (ANCOVA) were used for analysis. The outcomes showed that the volleyball players' vertical explosive power and speed had significantly increased, highlighting the value of the combined training method.

Keywords: Volleyball, Plyometric Training, Specific Skill Training, Vertical Jump, Speed

1. INTRODUCTION

A common training method used to improve sports performance is plyometric exercise. This technique involves quickly stretching the muscle-tendon unit and then contracting it. A key component of plyometric training is the stretch-shortening cycle (SSC), which is the fast shortening and elongation of muscles. The muscle-tendon unit's capacity to generate maximal force in the shortest amount of time is improved by the SSC. Plyometric training is an essential component of strength development and sport-specific power and speed because of these benefits **(Chu & Myer, 2013)**.

As plyometric training methods have developed throughout time, so too has the language used to describe them. The term "plyometrics" was used differently in previous physiological investigations, but it is now often used in American sports literature. This type of muscle activity was known as the stretch-shortening cycle in Sweden, Italy, and the Soviet Union. Plyometrics was first developed as a shock training technique by Russian national track and field jump coach Yuri Verkhoshansky. According to Verkhoshansky, a stimulus different from traditional training methods were necessary to achieve improved muscular performance **(Chu & Myer, 2013)**.

The terms "plyometrics" and "stretch-shortening cycle" are commonly used interchangeably, in spite of some distinctions held by certain scholars. Combining the Greek terms "plio" (more), "plythein" (increase), and "metric" (measure), "plyometrics" means "to increase measurement." In physiological literature, natural sports actions like running, jumping, and throwing are sometimes referred to as the stretch-shortening cycle. However, identical movements are specifically referred to as "plyometrics" in rehabilitation and conditioning contexts when they are employed in structured training regimens meant to maximize force generation and enhance athletic performance **(Chu & Myer, 2013)**.

It is commonly known that plyometric exercise is a beneficial tool for enhancing neuromuscular efficiency and motor learning. It increases the neuromuscular system's sensitivity, reactivity, and excitability, which helps with synchronization, force production, motor unit recruitment, and firing frequency.

The benefits of plyometric training—also referred to as ballistic training or stretch-shortening exercise—have been extensively examined in both athletic and non-athletic populations. This training method has been shown to increase muscular strength and power, enhance joint stability and function, reduce the risk of severe knee injuries, and improve running efficiency. Additionally, while research findings vary, many studies suggest that jump-specific plyometric exercises, such as depth jumps and drop jumps, significantly enhance vertical jump (VJ) performance. These improvements are largely attributed to increased power output, a higher rate of force development, and muscle fiber growth, all of which result from the stretch reflex, high eccentric loading, and the explosive nature of plyometric movements.

Despite the many advantages of land-based plyometric training, its high impact and intensity can cause musculoskeletal injuries, muscle damage, and acute discomfort. It might be necessary to postpone standard plyometric exercises until they can be properly incorporated into a rehabilitation program for people recuperating from an injury. Aquatic plyometric training, in which movements are done in water, is a workable substitute to reduce impact forces and eccentric stress while maintaining training effects.

The physiological demands of training for sports-specific skills have been examined in a number of studies, and they were compared with real competitive play. Even while the goal of sports-specific skill training is to emulate the general physical demands of team-sport competition, latest study demonstrates that it may not sufficiently replicate the repetitive high-intensity sprinting needs of actual gameplay.

Sports-specific skill training successfully replicates the demands of general competition, according to the majority of research. It might not, however, accurately capture the intense sprinting needed for games. Traditional conditioning programs and sports-specific skill training have both shown similar increases in physical fitness, but it's still unclear how best to combine the two training modalities.

2. METHODOLOGY

The purpose of this study was to look at how volleyball players' vertical explosive power and speed were affected by plyometric and specialized skill training. Twenty-four female volleyball players, ages 18 to 23, from Thoothukudi City were chosen at random to serve as the subjects. Two groups of participants were formed: Group II was the control group (CG), and Group I received plyometric training in addition to specific skill training (PMTASST). For eight weeks, the experimental group participated in evening sessions of a structured training program five days a week (Monday through Friday). Vertical explosive power and speed were the dependent variables in this study, and plyometric training combined with specific skill training (PMTASST) was the independent variable. These were evaluated using established test procedures: the 50-meter run (in seconds) was used to gauge speed, and the vertical leap test (in cm) was used to quantify vertical explosive force.A randomized design was used for both the pre-test and post-test. Each participant's data was gathered both before and after the training session, and paired sample t-tests and analysis of covariance (ANCOVA) were used for analysis. The outcomes showed that the volleyball players' vertical explosive power and speed had significantly increased, highlighting the value of the combined training method.

3. TRAINING PROGRAMME

Among female volleyball players, the combined effect of plyometric and specialized skill training was examined. With repetitions ranging from 6 to 18 each set and 2 to 18 sets per exercise, the 8-week training program changes in intensity from 45% to 80%. Between sets, there is a 50–80 second recovery period**.**

TRAINING SCHEDULE FOR SPECIFIC SKILL TRAINING	TRAINING SCHEDULE FOR PLYOMETRIC TRAINING
Fore Arm Pass Drills with Pair	Med ball Box Jump
Over Head Pass with Partner	Box Skip
Jump Service (Continuous)	Alternate Leg Bound
Blocking the Target	Double Leg Bound
Forward Roll with Ball	Lateral Bound
Spiking with Sprint	Double Leg Box Bound
Fore Arm Pass with Half Squad	Ankle Box Hop
Over Head Pass with 180^0 (Degree) Turning	Single Leg Stride Jump
Jump Service with Target	Med Ball Twister
Forward Roll and Fore Arm Pass	Depth Jump
Dropping Drills	
Fore Arm Pass with Floor touch	
Over Head Pass with Forward Roll	
Spiking Drills on the Target Zone	
Jump Service on the Target Zone	
Blocking Action with Pairs	

4.RESULTS AND DISCUSSION:

Table- I

Mean and paired sample ‘t’ test of experimental and control groups on selected variables

Variables	**Mean**	**PMTASST**	**Control Group**
Vertical Explosive Power	Pre test Mean	43.92	45.00
	Post test Mean	45.25	44.92
	‘t’ test	**7.09***	**1.00**
Speed	Pre Test Mean	7.42	7.38
	Post Test Mean	7.33	7.39
	‘t’ test	**11.00***	**1.00**

Significant at 0.05 level of confidence (11) = 2.201

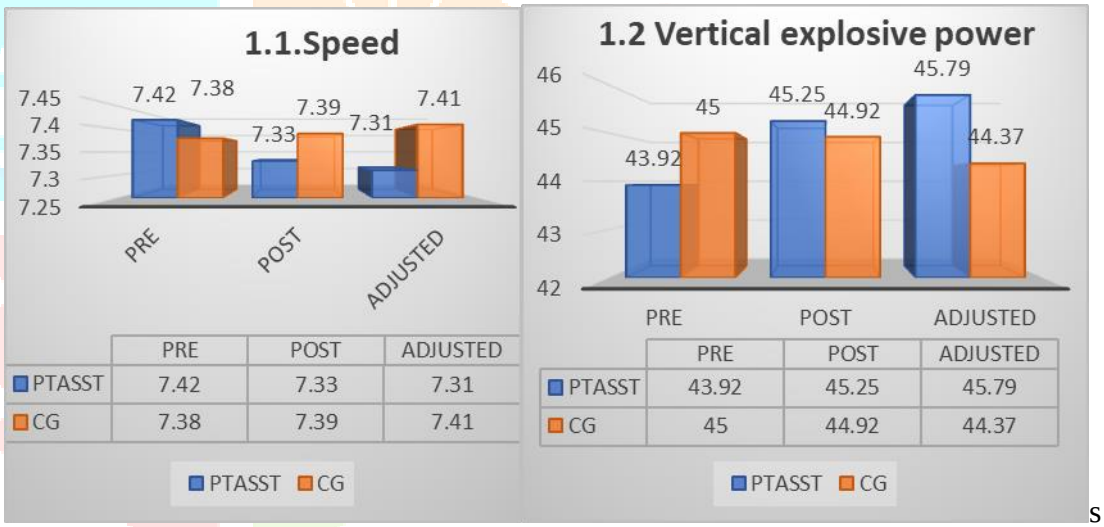
The paired sample 't' test was used to analyze the data belonging to the variables in this study in order to identify significant improvements, and analysis of covariance (ANCOVA) was used to each variable independent in order to evaluate differences. Every test was run with a significance level of 0.05. Table I displays the findings of the Vertical Explosive Power and Speed paired sample 't' test, which compares the experimental and control groups' pre- and post-test means.

TABLE- II
ANALYSIS OF COVARIANCE OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Adjusted Post Test Means		Source of Variance	SS	df	Mean Squares	'F'- Ratio
	Plyometric Training and Specific Skill Training	Control Group					
Vertical Explosive Power	45.79	44.37	Between	11.35	1	11.35	**42.71***
			Within	5.58	21	.266	
Speed	7.31	7.41	Between	.062	1	.062	**87.37***
			Within	.015	21	.001	

*Significant at .05 level of confidence, df (1, 21) = 4.32

As shown in Table II, the derived "F" ratio values are 42.71 and 87.37, which are greater than the table value of 4.32 with df 1 and 21 needed to be significant at the 0.05 level. An important difference has been made between the adjusted post means for the combined effect of plyometric training associated with specific skill training and the control group on vertical explosive power and speed, as indicated by the obtained value of the "F" ratio being higher than the table value.



Bar diagrams 1.1 and 1.2 display the pre, post, and adjusted post test mean values for college-level volleyball players' 1.1 speed and 1.2 vertical explosive power.

Vertical explosive power and speed may differ significantly depending on the combined effects of plyometric exercise and specialized skill training.

5. CONCLUSIONS

1.Vertical explosive power and speed were considerably increased by the combined effect of plyometric training associated with specific skill training (PMTASST) techniques.
2. The Combined Effect of Plyometrics Training Associated with Specific Skill Training (PTASST) and Control group (CG) adjusted post-test averages for vertical explosive power and speed differed significantly.

6. REFERENCE

[1] Donal A.Chu and Gregory D. Myer. (2013). Plyometrics. USA:IL, Human Kinetics, PP- 13-14.
[2] Tim Gabbett., David Jenkin., & Bruce Abernethy. (2009). Game based training for improving skill and physical fitness in team sports athletes. International Journal of Sports Science & Coaching, 4:2, PP-274-277.
[3] Tim Gabbett., David Jenkin., & Bruce Abernethy. (2009). Game based training for improving skill and physical fitness in team sports athletes. International Journal of Sports Science & Coaching, 4:2, PP-274277.

[4] Ana Filipa Silva, Filipe Manuel Clemente, Ricardo Lima, Pantelis T Nikolaidis, Thomas Rosemann, Beat Knechtle (2019) The Effect of Plyometric Training in Volleyball Players: A Systematic Review International Journal of Environmental Research Public Health 17(16) 2960. doi: 10.3390/ijerph16162960.

[5] Ashok, K. R., Balamurugan, B. & Karthik, R. V. (2012). Combined Effect of Plyometric Training and Skill Training on the Development of Fitness Related Parameters and Skill Performance variables among Male Volleyball Players. International Journal of Health, Physical Education and Computer Science in Sports. 8, 1.15-17.

[6] Beato, M., Bianchi, M., Coratella, G., Merlini, M. & Drust, B. (2018). Effects of plyometric and directional training on speed and jump performance in elite youth soccer players. J Strength Cond Res 32(2): 289296.

[7] Chidambararaja, S. (2014). Effect of Upper and Lower Limb Plyometric Training on Performance Variables of Basketball Players. International Journal of Recent Research and Applied Studies, 2 (1), 1 -3.

[8] Chundu Venkata Rao, & Kishore, Y. (2014). Combined Effect of Strength and Plyometric Training Programme on Selected Motor Fitness Components of Male Kabaddi Players. International Journal of Recent Research and Applied Studies, 2 (11), 4345.

[9] Gnaneshwar, M.N. & Gopinath, R. (2013). Effect of Plyometric Training Isotonic Training and Combination of Isotonic And Plyometric Training on Speed and Muscular Endurance. International Journal of Health, Physical Education and Computer Science in Sports, 11, 1.125-127.

[10] Marcello, R., Greer, B.K. & Greer, A.E. (2017). Acute effects of plyometric and resistance training on running economy in trained runners. Journal of Strength and Conditioning Research, 31(9), 2432-2437.

[11] Mohammad Javad Rahmanian, Mohsen Ghanbarzadeh & Saeid Shakerian (2017). Acute Effects of Plyometric Exercises Performed on Land and in Water on the Parameters of Bone Metabolism in Middle Aged Males. Annals of Military and Health Sciences Research, 15 (1).