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Effects of Plyometric Training With Core Exercises Program on Jump Service Ability among Men Volley Ball Players

Mr. P. Suryachandra Rao[1]* Dr. P. Johnson[2]

[1] PhD Research Scholar, University College of Physical Education and Sports sciences, Acharya Nagarjuna University, AP

[2] Principal, University College of Physical Education and Sports Sciences, Acharya Nagarjuna University, AP

Abstract – The present study was undertaken to analyze the effects of Plyometric training with core exercises on jump service ability among men volley ball players. The investigator has selected N=60 men inter collegiate level/state level participated volley ball players at random from various college of Rajiv Gandhi University of Knowledge Technologies Nuzvid, Krishna district, of Andhra Pradesh and their age range from eighteen to twenty five years as per their college record. The volley ball players chosen for the study were divided into four equal groups n=15 and designated as experimental group 'A' experimental group 'B' experimental group 'C' and control group 'D'. plyometric exercises training were given to group 'A' core training were given to group 'B', Combined training of plyometric exercises and core training were given to group 'C' and the 'CG' control group 'D' were restricted to participate in any activities. The trainings were given for a period of twelve weeks. The data were collected before and after the training by conducting Russell–Lange Volley ball Test – Jump service ability. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels. The results of the study showed that plyometric exercises, core training and combined training significantly improved jump service ability of the volley ball players when comparative with control group volley ball players.

Keywords: – Plyometric Exercises, Core Exercises, Jump, Service

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INTRODUCTION

The word plyometric exercises come from Greek, which means "length". Length refers powerful movements for enhanced performance. Plyometric exercises are key to develop maximal explosive power and speed movements (Hatfield, 1986). Plyometric exercises movements enable a muscle to reach maximal strength in as short a time as possible (Baechle, 1994). The fundamental movements of volleyball game are spike jump and block jump. Explosive power means jumping abilities. Volleyball players jumping ability are frequently used to measured lower limb explosive strength. Spike jump and block jump needed explosive power of leg to do successfully. Plyometric training program increase spike jump and block jump of volleyball players (Milic et al., 2008). Explosive strength exercises improve volleyball player's movement and reduce the risk of injury (Hrzenjak 2004). Plyometric training improves the volleyball player's vertical jumping ability. Plyometric exercises that exploit the stretch-shortening cycle of muscle, during stretch [deceleration phase] muscle store energy and during shortening [acceleration phase] muscle release energy (Asmussen, 1974 & Bosco, et. al., 1982). Wager and Kocak (1997) found that the rapid eccentric movement of muscles creates a stretch reflex that produces a more forceful concentric muscle action.

Bergmark (1989) stated that centre of gravity is located in lumbo pelvic-hip region. Lumbo pelvic-hip region is the core area of the body with twenty nine muscles of insertion from where all physical movements begin. Core stability is the motor control. Clark et al., (2000) stated that main function of core muscles to maintain dynamic postural equilibrium and postural alignment during physical functional activities, which assist to avoid distortion patterns and thus improve athletic performance. King (2000). Stated that core stabilization exercises used in rehabilitation programs in patients with low back pain to increase the muscular strength and endurance of lumbo pelvic-hip region 29 muscles. Some studies found that core stabilization training improves balance in people with mentally retarded and deaf students (Hessari et al., 2011). Core

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exercises training gain optimum strength and endurance of core abdominal and lower back muscles to stabilize the torso and allow the whole body to move freely (Latey, 2001).

STATEMENT OF THE PROBLEM:

The purpose of the study was to investigate the "effects of plyometric training with core exercises on jump service ability performance among men volley ball players".

OBJECTIVES OF THIS STUDY

1. To measure the influence of plyometric training treatment on jump service performance ability of volley ball players.
2. To evaluate the impact of core training treatment on jump service ability performance of volley ball players.
3. The examined the effect of combined training treatment on jump service ability performance ability of volley ball players.
4. To understand the changes between plyometric training, core training, and combined training on jump service performance ability of Volley ball players.

HYPOTHESES:

- It was hypothesis that there will be a significant improvement on jump service ability performance after the twelve weeks of training in plyometric group, core training group volley ball players and combined training group [plyometric and core training] group volley ball players when compared with control group volley ball players.
- It was hypothesis that combined training group volley ball players will be superior to the plyometric training group and core training group volley ball player on jump service ability performance.

METHODOLOGY:

The purpose of this study was to find out the effects of Plyometric training with core exercises on jump service ability performance among men volley ball players. To achieve the purpose of this study investigator has selected N=60 men inter collegiate level and state level participate volley ball players at random from various college of various college of Rajiv Gandhi University of Knowledge Technologies Nuzvid, Krishna district, of Andhra Pradesh and their age range from eighteen to twenty five years as per their college record.. The volley ball players chosen for study was divided into four groups each groups consisted of twelve volley ball players and designated as experimental group 'A' experimental group 'B' experimental group 'C' and control group 'D'. Plyometic training were given to group 'A' [PTG] core training were given to group 'B' [CTG], Combined training of plyometric and core training were given to group 'C' [CPCTG] and the 'CG' control group 'D' was restricted to participate in any of the training programme other than their regular activities.

Training was given three days in a week for twelve weeks to PTG, CTG and CPCTG volley ball players. The subject were tested on jump service ability performacne at the beginning (Pre-test) and at the end of the experimental period (Post-test). To measure the jump service ability performance Russell–Lange Volley ball Test were used respectively because of their simplicity and availability of necessary facilities, instrument and equipment's. The analysis of data on Russell–Lange Volley ball test data have been examine by ANCOVA in order to determine the differences if any among the group at pre and posttest.

Table – I

Analysis of Covariance of PTG, CTG, CPCTG and CG Volley ball players for Jump service ability performance [In number]

TEST	PT GROUP	CT GROUP	CPCT GROUP	C GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	31.86	31.93	30.80	31.40	Between	12.33	3	4.11	0.34
SD	3.29	2.40	3.32	4.54	Within	668.00	56	11.94	
Post Test Mean	38.066	35.40	39.33	28.86	Between	978.98	3	326.32	27.37
SD	3.23	2.55	2.91	4.70	Within	667.00	56	11.92	
Adjustal Post Test Mean	37.79	35.07	39.85	28.94	Between	1009.85	3	336.61	62.19
					Within	297.69	55	5.41	
Mean Diff	6.2	3.47	8.53	2.54	-	-	-	-	-

PTG: Plyometric training group Volleyball players; CTG: Core training group Volleyball players; CPCTG: Combined plyometric and core training group Volleyball players; CG: Control group Volleyball players

Required table F-ratio at 0.05 level of confidence for 3 and 56 (df) =2.77, 3 and 55 (df) =2.77.

*Significant.

The above table-I shows that there is a significant difference on jump service ability perofrmance among the four groups such as plyometric training group [PTG], core training group (CTG), combined training of plyometric and core training [CPCTG] and control group (CG). Since the calculated 'F' value required being significant at 0.05 level for d/f 3, 56 and 3, 55 are 2.77 and 2.77, but the calculated values of jump service ability performance post and adjusted posttest 'F' values are 27.37 and 62.19 respectively. Which are higher than the tabulated

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value. Since the obtained 'F' ratio is found significant.

Table – II

Scheffes Post hoc test for mean difference between PTG, CTG, CPCTG and CG Volley ball players for Jump service ability performance [In number]

ADJUSTED POSTTEST MEANS VALUES					Required C I
PT GROUP	CT GROUP	CPCT GROUP	C GROUP	Mean Difference	
37.79	35.07	-	-	2.72*	2.44
37.79	-	39.85	-	2.06	2.44
37.79	-	-	28.94	8.85*	2.44
-	35.07	39.85	-	4.78*	2.44
-	35.07	-	28.94	6.13*	2.44
-	-	39.85	28.94	10.91*	2.44

**Significant at 0.05 level of confidence*

The mean difference PTG volley ball players and CTG volley ball players, PTG volley ball players and CG volley ball players, CTG volley ball players and CPCTG volley ball players, CTG volley ball players and CG volley ball players, CPCTG and CG volley ball players were 2.72, 8.85, 4.78, 6.13 and 10.91 which are higher than the CI value 2.44. Therefore study approved that there is significant differences exist between above groups on volley ball players. Further the study proved that there is no significant difference between PTG and CPCTG.

The prior test mean value, post test mean values and adjusted post test mean values of PTG, CTG, CPCTG and CG volley ball players for jump service ability performance displayed in bar graph

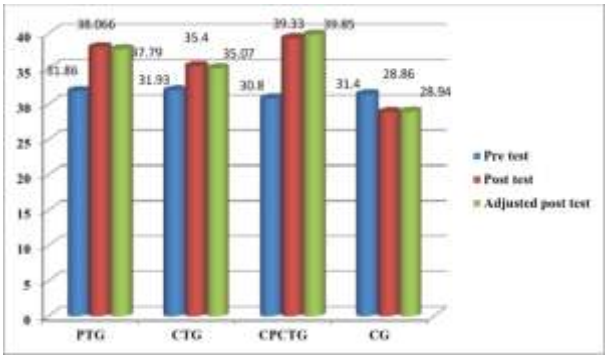

Figure –I display the line graph of pre test, post test and adjusted post test mean values for jump service ability of PTG, CTG, CPCTG and CG volley ball players.

DISCUSSION ON HYPOTHESIS:

- In the first hypothesis it was stated that there will be a significant improvement on jump service ability after the twelve weeks of training in plyometric group, core training group volley ball player, and combined training group [plyometric exercises and core training] group volley ball players when compared with control group volley ball players. The result of the study found that experimental group's volley ball players jump service ability performance level improved when compared with control group. Hence the research hypothesis is accepted.

- In second hypothesis mention that combined training group volley ball players will be superior to the plyometric training group and core training group badminton player. The study found no significant difference between plyometric training groups and combined training group volley ball players. Hence research second hypothesis rejected.

DISCUSSION AND FINDINGS:

The study analysis report proved that jump serve ability and volleying ability of the three empirical group's volleyball players: PTG, CTG and CPCTG significant improved as more point secured in Russell–Lange Volley ball Test due to the training of explosive strength exercises [Plyometric], core exercises, combined explosive strength exercises [plyometric] and core exercises. The research articles related to the experimental treatment effect on volleyball skill related performance parameters were Rama and Ratnakara (2016) after statistical analysis of data concluded that plyometric training positively improved the jump serve ability of the intercollegiate men volleyball players. Satyanarayana and Johnson (2019) study result revealed that serving ability of the three experimental group's volleyball significantly improved with plyometric training, circuit training and combined plyometric and circuit training. Aysegul (2019) study found significant positive improvement on serve accuracy score test performance and velocity of the service performance of volleyball players with six weeks core exercises program. Sandipkumar et al., (2014) research study found plyometric exercises and pilates exercises were effective to improve Vertical Jump height, Block jump, attack jump and agility of volleyball players. Nasuka and Asdi (2019) study concluded that squat jump exercises are effective to increase the spike jump and block jump reach of volleyball players. Hamdy and Mohamed (2015) study proved that core stability training was more effective which led to improve the accuracy performance of spike from back row attack. Selvakumar & Palanisamy (2017) research study proved that strength exercises and explosive strength exercises improved the serving and passing ability of volleyball players.

CONCLUSIONS:

The statistical result on jump service ability - Russell–Lange Volley ball Test concluded that plyometric training group volley ball players [PTG], core training group volley ball players [CTG],

combined plyometric and core training group volley ball players [CPCTG] had score more numbers comparison to control volley ball players group [CG]. The study further proved that plyometric training group volley ball players [PTG] score more numbers on jump service ability - Russell–Lange Volley ball Test than core training group volley ball players [CTG]. Whereas no significant changes between plyometric training group volley ball players [PTG] and combined plyometric and core training group volley ball players [CPCTG] on jump service ability **-** Russell–Lange Volley ball test. Finally combined plyometric and core training group volley ball players [CPCTG] score more number than core training group volley ball players [CTG] on jump service ability.

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Corresponding Author

Mr. P. Suryachandra Rao*

PhD Research Scholar, University College of Physical Education and Sports sciences, Acharya Nagarjuna University, AP