Journal of Advances and Scholarly Researches in Allied Education
Vol. 16, Issue No. 4, March-2019, ISSN 2230-7540

Effect of Plyometric Training on Selected Physical and Physiological Variables among Physical Education Students in Volleyball Players

Dr. A. Senthilkumar*

Director of Physical Education, Karpagam Institute of Technology, Coimbatore

Abstract – This study was designed to investigate the Effect of plyometric training on selected physical and physiological variables among physical education students in volleyball players. 30 inter-collegiate male volleyball players from Karpagam Institute of Technology, Coimbatore, were selected for the purpose of the research. Two similar classes (n=15) were randomly allocated to the subjects. Group I underwent Plyometric Training (PTG) and Group - II served as a monitoring group (CG). The experimental group was given plyometric training for 3 days per week (Monday, Wednesday and Monday). The physical parameters of speed (50 mts dash), leg explosive power (vertical jump) and physiological parameters (Breath Holding Time, Resting Heart Rate) before and after training period. The data collected from the subjects was statistically analyzed with't' test to find out significant improvement if any at 0.05 level of confidence. The result of the speed, leg explosive power and Breath Holding Time, Resting Heart Rate speculated significant improvement due to influence of plyometric training with the limitations of (diet, climate, life style) status and previous training. The result of the present study coincide findings of the investigation done by different experts in the field of sports sciences. Plyometric training group significantly improved speed, leg explosive power and Breath Holding Time, Resting Heart Rate college male Volleyball players.

Keywords: Plyometric Training, Speed, Leg Explosive Power, Breath Holding Time, Resting Heart Rate

----------X----------

INTRODUCTION

Plyometric Training Plyometric (also known as "ploys") is a method of training designed to generate fast, powerful movements and enhance the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements in which a muscle is loaded and then contracted in rapid sequence, depending on the intended training intent, use the strength, elasticity and innervation of the muscle and surrounding tissues to jump higher to 23, run faster, throw deeper, or strike harder. Plyometric movements in which a muscle is primed and then contracted in fast sequence, depending on the intended training intent. Plyometric is used to improve muscle contraction speed or strength, offering explosiveness for a number of sports-specific contractions. Benefits range from injury prevention, power development and sprint performance amongst others. In both your upper and lower body, plyometrics will boost strength. Tuck bounces, squat jumps, box jumps, and depth jumps are examples of lower-body plyometrics. The purpose of these jumps is to get higher, using your leg strength to raise the height of your leap. The plyometric upper body involves clapping push ups, tossing of the medicine ball chest press and overhead throws. In your upper body, these help increase strength. Plyometric exercises, since they are extremely intense, take a lot of energy. They use the whole body and activate the majority of muscle groups. The repetitive landing causes your cardiovascular exercise, allowing you to "kill two birds with one stone.

VOLLEYBALL

Volleyball is a dynamic, fast-paced game. The goal of strength training in volleyball is not to build big muscles, but to learn the physical skills needed to improve a player's performance. For volleyball, strength training is also very necessary and should not be learned independently of other skills, such as stamina, speed and endurance. The one word that comes to mind is "quick" while watching a great volleyball player. Everything the player does is short and quick. There are no long drawn out

motions like sprinting in other sports. There is simply a succession of explosive bursts that keep the ball in play and control the flow of the game. The quickness that must be focused on, when training a volleyball player is not only quickness from side to side and front to back, but also quickness from up to down. Different to other sports, volleyball players must be able to change direction quickly from the upward motion of a vertical leap to the downward motion of a point-saving dig (or vice versa).To play volleyball one has to be good at vertical jump, known as explosive power. For five sets, a volleyball match can be played, meaning a match can last about 90 minutes, during which a player can perform 250-300 acts dominated by the explosive type of leg muscle strength. The total number of actions as jumps takes up around 50-60% high speed movements and change of direction in space about 30% and as falls about 15%. The spike and block actions are entire leg muscles to contract, helping to improve overall tone and definition. Plyometric incorporates strength training and is dominated by the corresponding form of explosive force known as the vertical jump of a player, which is typically the key to the winning point.

METHODS

Experimental approach to the issue To solve the problem the hypothesis presented herein, we selected 30 inter-collegiate men volleyball players from Karpagam Institute of Technology, Coimbatore**.** The participants were randomly assigned to two equivalent groups, namely the Plyometric Training Group (PTG) (n=15) and the Control Group (CG) (n=15). In order to repair the load, a pilot study was performed to determine the initial ability of the subjects. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine.

DESIGN

The evaluated physical parameters were physical parameters of speed (50 mts dash), leg explosive power (vertical jump) and the unit of measurement was in counts, and Breath Holding Time, Resting Heart Rate the unit of were measured at baseline Yogic activities were reviewed after 12 weeks.

TRAINING PROGRAMME

The training program lasted 45 minutes a day for each course, 3 days a week for a total of 12 weeks. The 45 minutes included 10 minutes of warm-up, 25 minutes of plyometric training and 10 minutes of warm-down. 5 percent of the load strength was raised from 65 percent to 80 percent of the work load every three weeks of preparation. The aerobic dance training volume is recommended on the basis of the number o. The intensity of exercise for 10 weeks before tapering off during 11th and 12th weeks as removal by Piper and Erdman (1998). Training intensity has been decreased, so that exhaustion during post-testing is not a factor.

Table 1: Plyometric Training Schedule for Impact per Session

Training week	Name of the Plyometric Exercises	Sets & Repetition	Intensity
I & II	Side to side ankle hops	3X6	60%
	Double leg hops	3X6	
	Lateral cone hops	3X6	
	Single leg bounding	3X6	
III & IV	Side to side ankle hops	4X8	65%
	Double leg hops	4X8	
	Split jumps	4X8	
	Lateral cone hops	4X8	
	Single leg bounding	4X8	
V & VI	Side to side ankle hops	3X8	70%
	Double leg hops	3X8	
	Split jumps	3X8	
	Lateral cone hops	3X8	
	Single leg bounding	3X8	
VII & VIII	Side to side ankle hops	4X9	75%
	Double leg hops	4X9	
	Split jumps	4X9	
	Lateral cone hops	4X9	
	Single leg bounding	4X9	
IX & X	Side to side ankle hops	5X8	80%
	Double leg hops	5X8	
	Split jumps	5X8	
	Lateral cone hops	5X8	
	Single leg bounding	5X8	
XI & XII	Side to side ankle hops	4X10	85%
	Double leg hops	4X10	
	Split jumps	4X10	
	Lateral cone hops	4X10	
	Single leg bounding	4X10	

STATISTICAL ANALYSIS

The collected data before and after training period of 12 weeks on the above said variables due to the effect of Plyometric training was statistically analyzed with The major improvement between pre and posttest is discovered by't 'test t. The criterion for statistical significance was set at a degree of confidence of 0.05 in all cases.

Table 2: Computation of 'T' Ratio on Selected Plyometric Training Variables of College Men Volleyball Players on Experimental Group and Control Group

Group	Variables	Test	Mean	Std. Deviation	Std. Error	T ratio
Experimental group	Speed	Pre Test	7.81	0.04	0.003	13.43*
		Post Test	7.7	0.43		
	leg explosive power	Pre Test	28.60	2.16	0.62	8.46*
		Post Test	33.93	2.68		
	Breath Holding Tim	Pre Test	30.26	4.12	0.26	4.34*
		Post Test	31.37	3.53		
	Resting Heart Rate	Pre Test	76.53	2.45	0.22	8.67*
		Post Test	74.67	2.09		
Control group	Speed	Pre Test	7.81	0.41	0.02	0.48
		Post Test	7.82	0.43		
	leg explosive power	Pre Test	26.73	3.01	0.80	1.07
		Post Test	27.60	3.06		
	Breath Holding Tim	Pre Test	29.14	4.28	0.67	1.01
		Post Test	29.84	4.60		
	Resting Heart Rate	Pre Test	77.33	4.15	0.44	1.50
		Post Test	76.67	3.83		

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

Table 2 shows the mean, standard deviation and non-ratio measurement on selected physical and physiological parameters, namely speed, explosive

strength, Breath Holding Time, experimental group Resting Heart Rate. The obtained 't' ratio on speed, explosive power, Breath Holding Time, Resting Heart Rate were 13.43, 8.46 and 4.34, 8.67 respectively. The required table value was 2.14 for the degrees of freedom 1and 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. In addition, the mean, standard deviation and non-ratio computation on selected physical and physiological parameters, namely speed, explosive strength, Breath Holding Time, Resting Heart Rate control group. The obtained 't' ratio on speed, explosive power, Breath Holding Time, Resting Heart Rate were 0.48,1.07 and 1.01, 1.50 respectively. The required table value was 2.14 for the degrees of freedom 1and 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.

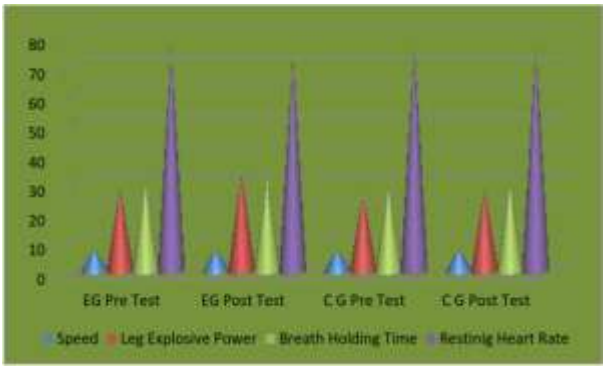

Fig 1: Bar diagram displaying the mean value on physical and physiological Parameters of inter collegiate male volleyball players on experimental and control group

DISCUSSION FINDINGS

The present study investigated the impact of plyometric training on the physical and physiological parameters of male volleyball players. The outcome of the study showed that the Plyometric training improved the physical parameters such as speed, explosive strength, Breath Holding Time, Resting Heart Rate, and the results of the present study were close to the results of the investigations referred. Ahilan, Singh Harman deep, (2015) reported that the Vertical Jumping for Plyometric training program on effective for volleyball players. Vladan Milić et al., (2008) reported that the plyometric training on statistically significant deferens in explosive strength of cadet volleyball players. Shaikmannan (2015) suggestion that the volleyball specific plyometric training can improve arm and leg explosive power of male volleyball players. Annadurai (2014) [2] revealed that the selected dependent variables such as speed, explosive power, serving Ability and passing ability have significant improvement due to the Swiss ball and plyometric training Programme. From of result of the present study, it is speculated that the observed changes in speed, explosive power, Breath Holding Time, Resting Heart Rate may properly designed Plyometric training which are suitable for men Volleyball players at college level.

CONCLUSIONS

1. It was concluded that 12 weeks twelve weeks Plyometric training significantly improved the speed, explosive power, Breath Holding Time, Resting Heart Rate of the male volleyball players.

2. Plyometric training is one among the most appropriate means to bring about the desirable changes over physical and physiological variables of volleyball players. Hence, suggested that coaches and the experts deal with Volleyball players to incorporate. Plyometric training as a component in their training Programme.

REFERENCES

1. Abolghasem et. al. (2014). Effects of plyometric training on skill performance in soccer players. International Journal of Current Research and Academic review; 2: pp. 242-247.

2. Annadurai R. (2014). Effect of swiss ball and plyometric training Programme on selected physical variables and skill performance of inter collegiate men volleyball players. Academic Sports Scholar; 3(5).

3. Andrija Atanaskovic (2013). Effect of plyometric training on the Explosive power of the lower extremities of handball players. Sport - Science & Practice; 3: pp. 17-27.

4. Andrade et. al. (2013). Effects of plyometric training volume and training surface on explosive strength. Journal of Strength and Conditioning Research Publish Ahead of Print; 27(10): pp. 2714-2722.

5. Eskandar Taheri et. al. (2014). The Effect of 8 weeks of plyometric and resistance training on agility, speed and explosive power in soccer players. European Journal of Experimental Biology; 4(1): pp. 383-386.

6. Altena T.S., Michaelson J.L., Ball S.D., Guilford B.L., Thomas T.R. (2006). Lipoprotein subfraction changes after continuous or intermittent exercise training. Medicine Science Sports and Exercise; 38: pp. 367-372.

doi:10.1249/01.mss.0000185088.33669.fd [Back to text]

7. Astrand P.O., Rodhal K. (1986). Textbook of work physiology. New York: McGraw-Hill. [Back to text]

8. Bompa T.O. (1999). Periodization training for sports. Champaign, IL: Human Kinetics. [Back to text]

9. Burnham T.R., Ruud J.D., Mcgowan R. (2010). Bench press training program with attached chains for female volleyball and basketball athletes. Perceptual Motor Skills; 110: pp. 61-68. DOI:10.2466/pms.110.1.61-68 [Back to text]

10. Carbuhn A.F., Fernandez T.E., Bragg A.F., Green J.S., Crouse S.F. (2010). Sport and training influence bone and body composition in women collegiate athletes. The Journal of Strength and Conditioning Research; 24: pp. 1710-1717. doi:10.1519/JSC.0b013e3181d09eb3 [Back to text]

Corresponding Author

Dr. A. Senthilkumar*

Director of Physical Education, Karpagam Institute of Technology, Coimbatore