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Influence of plyometric training programme on selected physical fitness variables among volleyball players

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Abstract
The reason of this study was to discover the influence of plyometric training programme on selected physical fitness variables among inter-collegiate level men volleyball players. To realize this purpose of the study thirty various colleges of Virudhunagar district, Tamil Nadu state, India. The subject had past experience of at least three years in volleyball and was randomly selected as subjects. Their age ranged in between 19 and 22 years. The subjects were divided into two groups namely plyometric group and control group. The plyometric group was subjected to plyometric training (for weekly three days Monday, Wednesday, Friday) at evening session for six weeks. Speed, agility and leg explosive power was selected as dependent variable. After the collection of appropriate data, it was statistically analyzed by using paired 't' test. The level of significance was set at 0.05. The result of the present study showed that the plyometric training has significant improvement on speed, agility and leg explosive power of inter-collegiate level men volleyball players.

Keywords: Plyometric training, physical fitness variables, volleyball players

Introduction
Plyometric (in any case called "ploys") is such a movement planning proposed to convey fast, amazing turns of events, and improve the components of the tactile framework, all things considered to improve execution in sports. Plyometric advancements, in which a muscle is stacked and subsequently contracted in speedy game plan, use the strength, adaptability and innervations of muscle and enveloping tissues to 23 bob higher, run faster, throw further, or hit all the more energetically, dependent upon the ideal planning objective. Plyometric is used to accelerate or force of strong tightening influences, offering sensitivity to a variety of game express activities. Plyometric has been showed up across the composition to be helpful to a grouping of contenders. Benefits range from injury expectation, power improvement and run execution among others. Plyometric practice insinuates those activities that enable a muscle to show up at maximal force in the briefest possible time. "Plyometric" is a blend of Greek words that from a genuine perspective expects to extend assessment plyometric practice is an expedient, inconceivable improvement using a pre-stretch or counter turn of events, which incorporates the stretch-shortening cycle (SSC). The justification plyometric practice is to assemble the power of coming about improvements by using both the typical adaptable pieces of muscle and tendon and the stretch reflex. To effectively use plyometric as a component of an arrangement program, it is fundamental to get: the mechanics and physiology of plyometric work out norms of plyometric program plan and techniques for safely and sufficiently performing unequivocal plyometric works out. Plyometric incorporate force bouncing, dull hopping and quick force creation. Exactly when your muscles unusually contract, or curtail, by then rapidly expand and stretch, they produce maximal power ideal for athletic conditions. It is a fast improvement that happens over a concise period. Plyometric are ideal for contenders or people wanting to improve solid power, speed and strength (Baechle, 2008). Volleyball is a gathering action where two gatherings of six players are secluded by a net. Each gathering endeavours to score centres by building up a ball in the other gathering's court under composed rules. It has been a piece of the power program of the Summer Olympic Games since 1964. The all out guidelines are expansive. In any case, just, play proceeds as follows:

a major part in one of the gatherings begins a 'rally' by serving the ball (tossing or conveying it and a while later hitting it with a hand or arm), from behind as far as possible line of the court, over the net, and into the tolerating gathering's court. As volleyball coordinate incorporates a more noteworthy measure of aptitude execution. Which build the parts for the game, as an investigation specialist unprecedented masterminded plyometric getting ready program for the school level young fellows volleyball players (Holyoke, 1985).

Methodology

The reason of this study was to discover the influence of plyometric training programme on selected physical fitness variables among inter-collegiate level men volleyball players. To realize this purpose of the study thirty various colleges of virudhunagar district, Tamil Nadu state, India. The subject had past experience of at least three years in volleyball and was randomly selected as subjects. Their age ranged in between 19 and 22 years. The subjects were divided into two groups namely plyometric group and control group. The plyometric group was subjected to plyometric training (for weekly three days monday, wednesday, friday) at evening session for six weeks. Speed, agility and leg explosive power was selected as dependent variable. After the collection of appropriate data, it was statistically analyzed by using paired‘t’ test. The level of significance was set at 0.05.

Table I: Criterion Measures Physical Fitness Variables

Variables	Test Items	Unit of Measurement
Speed	50 Meters Dash	In Seconds
Agility	Shuttle Run (4 x 10m)	In Seconds
Leg Explosive Power	Standing Broad Jump	In Meters

Training Procedure

For plyometric group underwent their training programme as three days per week for six weeks. Training was given in the evening session. The training session includes warming up and cool down. Every day the workout lasted for 45 to 60 minutes approximately. The subjects underwent their training programmes as per the schedules such as side to side ankle hops, double leg hops, split jumps, lateral cone hops and single leg bounding under the strict supervision of the investigator. During experimental period control group did not participate in any of the special training.

Results

Table II: Comparison of Mean, and ‘t’-Values of Physical Fitness Variables between Pre & Post Test among Plyometric and Control Groups

S. No	Physical Fitness Variables	Groups	Test	Mean	‘t’ Values
1.	Speed	Plyometric group	Pre-Test	7.11	12.83*
			Post Test	6.10	
		Control group	Pre-Test	7.39	0.51
			Post Test	7.40	
2.	Agility	Plyometric group	Pre-Test	11.40	6.16*
			Post Test	10.64	
		Control group	Pre-Test	11.39	1.78
			Post Test	11.37	
3.	Leg Explosive Power	Plyometric group	Pre-Test	2.27	3.84*
			Post Test	2.76	
		Control group	Pre-Test	2.27	0.53
			Post Test	2.28	

*Significant at 0.05 level of confidence

Table-II reveals that the obtained mean values of per test and post test of plyometric group for speed, agility and leg explosive power were 7.11 and 6.10, 11.40 and 10.64, 2.27 and 2.76 respectively; the obtained ‘t’ ratio were 12.43, 6.16 and 3.84 respectively. The tabulated ‘t’ value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated ‘t’ ratio was greater than the table value. It is found to be significant change in speed, agility and leg explosive power of the volleyball players. The obtained mean values of Pre-Test and post test scores of control group were 7.39 and 7.40, 11.39 and 11.40, 2.27 and 2.28 respectively, the obtained ‘t’ ratio was 0.51, 1.78 and 0.53. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated ‘t’ ratio was lesser than the table value. It is found to be insignificant changes in speed, agility and leg explosive power of the volleyball players. The mean values of selected physical fitness variables among plyometric group and control group are graphically represented in figure-1.

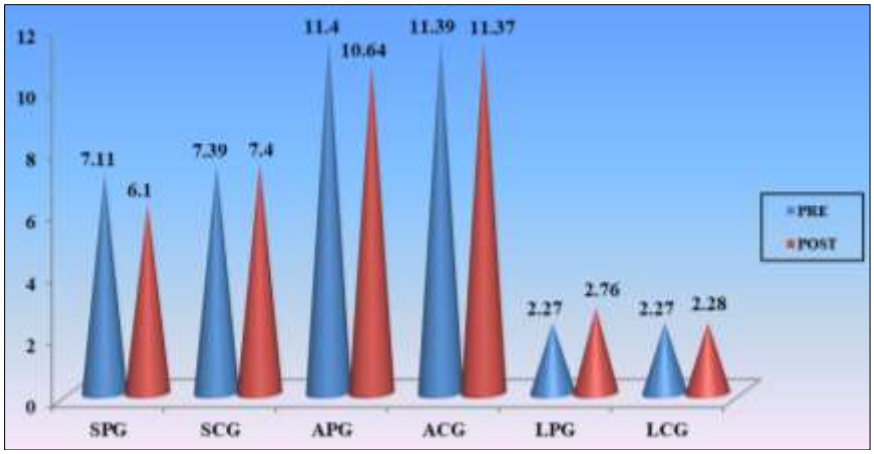

Fig 1: Bar Diagram Showing the Pre-Test and Post Test on Selected Physical Fitness Variables of Plyometric and Control Groups (SPG, SCG, APG, ACG, LPG & LCG)

Discussion on Findings

The results of the study indicated that the selected physical fitness variables such as speed, agility and leg explosive power were improved significantly after undergoing plyometric training. The changes in the selected parameters were attributed the proper planning, preparation and execution of the training package given to the players. The findings of the present study had similarity with the findings of S Senthil Kumaran (2018) [1], Nithin Rajan and Ahamed Faiz PA (2018) [5], Keerthi Kumar M, Sundar Raj (2016) [4]. The results of the present study indicates that the plyometric training methods is appropriate protocol to improve speed, agility and leg explosive power of inter-collegiate level men volleyball players. From the result of the present study it is very clear that the selected physical fitness variables such as speed, agility and leg explosive power improvement significantly due to plyometric training.

Conclusions

Based on the findings and within the limitation of the study

1. It was noticed that practice of plyometric training helped to improve selected physical fitness variables of inter-collegiate level men volleyball players.
2. It was also seen that there is progressive improvement in the selected criterion variables of plyometric group of inter-collegiate level men volleyball players after six weeks of plyometric training programme.
3. Further, it also helps to improve selected physical fitness variables such as speed, agility and leg explosive power.

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