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IMPACT OF PLYOMETRIC TRAINING ON PERFORMANCE-RELATED FITNESS VARIABLES IN BASKETBALL PLAYERS

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Abstract

The purpose of this study was to explore the impacts of plyometric training on Performance-Related fitness variables among basketball players. To achieve this purpose of the study thirty College level Men's basketball players were selected from DYES, Bangalore, Karnataka, India were randomly selected as subjects. Their age ranged in between 18 and 23 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 basketball players.

Keywords: plyometric training, physical fitness variables, basketball players

INTRODUCTION

Plyometric (also known as "ploys") is a type of exercise training designed to produce fast, powerful movements, and improve 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, use the strength, elasticity and innervations of muscle and surrounding tissues to 23 jump higher, run faster, throw further, or hit harder, depending on the desired training goal. Plyometric is used to increase

the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development and sprint performance amongst others. Plyometric exercise refers to those activities that enable a muscle to reach maximal force in the shortest possible time. "Plyometric" is a combination of Greek words that literally means to increase measurement plyometric exercise is a quick, powerful movement using a pre-stretch or counter movement, which involves the stretch-shortening cycle (SSC). The purpose of plyometric exercise is to increase the power of subsequent movements by using both the natural elastic components of muscle and tendon and the stretch reflex. To effectively use plyometric as part of a training programme, it is important to understand:

1. The mechanics and physiology of plyometric exercise
2. Principles of plyometric programme Design
3. Methods of safely and effectively performing specific plyometric exercises. Plyometric involve power jumping, repetitive bounding and quick force production. When your muscles eccentrically contract, or shorten, then immediately stretch and lengthen, they produce maximal power ideal for athletic situations. It is a fast movement that happens over a short period. Plyometric are ideal for athletes or people looking to improve muscular power, speed and strength (Baechle, 2008).

Basketball is one of the fastest games in which high level conditioning and coordinative abilities with technical and tactical potentials are essential to perform every skill at desired or required level. In basketball is a same speed, leg explosive power and agile.

METHODOLOGY

The purpose of this study was to explore the impacts of plyometric training on Performance-Related fitness variables in basketball players. To achieve this purpose of the study thirty college level Men's basketball players were selected from DYES, Bangalore, Karnataka, India were randomly selected as subjects. Their age ranged in between 18 and 23 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 1: Criterion Measures Physical Fitness Variables

Variables	Test items	Unit of measurement
Speed	AAPHERD Youth Fitness Test (50meters Dash)	In Seconds
Agility	JCR Test (Shuttle Run)	In Seconds
Leg Explosive Power	JCR Test (Vertical Jump)	In Centimeters

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 2: Comparison of Mean, and 't'-Values of Fitness Variables between Pre & Post Test among Plyometric and Control Groups

S. No	Fitness Variables	Groups	Test	Mean	't' Values
1.	Speed	Plyometric group	Pre Test	7.81	13.43*
			Post Test	7.77	
		Control group	Pre Test	7.81	0.48
			Post Test	7.82	
2.	Agility	Plyometric group	Pre Test	20.61	13.16*
			Post Test	20.58	
		Control group	Pre Test	20.77	1.75
			Post Test	22.34	
3.	Leg Explosive Power	Plyometric group	Pre Test	35.06	15.04*
			Post Test	37.80	
		Control group	Pre Test	34.26	0.52
			Post Test	34.13	

*Significant level of confidence at 0.05

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 7.81 and 7.77, 20.61 and 20.58, 35.06 and 37.80 respectively; the obtained 't' ratio were 13.43*, 13.16* and 15.04* 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 basketball players.

The obtained mean values of pre-test and post test scores of control group were 7.81 and 7.82, 20.77 and 22.34, 34.26 and 34.13 respectively, the obtained 't' ratio was 0.48, 1.75 and 0.52. 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 basketball players. The mean values of selected physical fitness variables among plyometric group and control group are graphically represented in fig-1

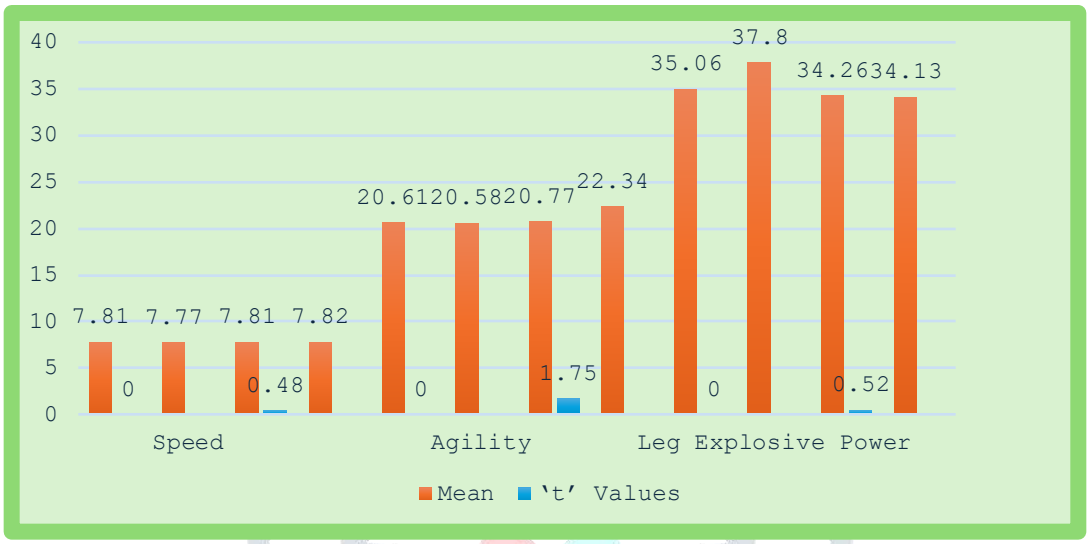

Fig 1: Bar Diagram Showing the Pre Test and Post Test on Performance-Related Fitness Variables of Plyometric and Control Groups (SPG, SCG, APG, ACG, LPG & LCG)

DISCUSSION ON FINDINGS

The results of the study indicated that the Performance-Related 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 Nithin Rajan and Ahamed Faiz PA (2018) [4], Keerthi Kumar M, Sundar Raj (2016) [3], Veeramani (2015) [6], The results of the present study indicates that the plyometric training methods is appropriate protocol to improve speed, agility and leg explosive power of college level Men's basketball 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

- It was noticed that practice of plyometric training helped to improve selected physical fitness variables of college level Men's basketball players.

- It was also seen that there is progressive improvement in the selected criterion variables of plyometric group of college level Men's basketball players after six weeks of plyometric training programme.
- Further, it also helps to improve selected physical fitness variables such as speed, agility and leg explosive power.

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