ISOLATED AND COMBINED EFFECTS OF PLYOMETRIC AND WEIGHT TRAINING ON EXPLOSIVE POWER AMONG BASKETBALL PLAYERS

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Abstract

This study investigated the isolated and combined effects of plyometric and weight training on explosive power among basketball players. To achieve this purpose of the study, sixty basketball players from in and around Kottayam, Kerala, India, whose ages ranged between 18 and 25 years, were selected as subjects. The selected subjects were divided into four equal groups. Group – I - (n = 15) underwent plyometric training, group – II - (n = 15) underwent weight training, group – III - (n = 15) underwent combined training, and group – IV - (n = 15) acted as the control group which does not participate in any special training. This study's training program was carried out thrice weekly for twelve weeks. The selected dependent variable, explosive power, was measured by vertical jump test before and after training. The assessed data of the four groups were calculated through ANCOVA statistics. When the 'F' (adjusted) score in ANCOVA was high, the post hoc (Scheffe's) test was followed. A confidence level of 0.05 was set. Due to the isolated and combined effect of plyometric and weight training, the explosive power of basketball players notably progressed; however, the plyometric training group was much superior to the combined and weight training group in improving the explosive power of basketball players. The combined training group was much superior to the weight training group in improving the explosive power of basketball players.

Keywords: Plyometric training, Weight training, Basketball, Explosive power

Introduction

Basketball is a highly competitive game that demands high physical qualities. The prime physical qualities are explosive strength, endurance, agility, speed, various coordinative abilities, etc. Height without fitness or technical ability without endurance becomes a liability. In all court games, including basketball, fast starts, sudden stops, and quick changes in direction are essential to good performance.

Plyometrics is a term for exercises that help bridge the gap between strength and speed. It refers to human movement that involves an eccentric muscle contraction immediately and rapidly, followed by a concentric contraction. The main objective of plyometric training is to improve quickness through strength. The fast twitch or white fiber is responsible for explosive muscular contraction.

Weight or strength training has gained tremendous popularity in recent years, mainly due to its appeal and positive impact on many diverse populations, such as athletic, recreational, and clinical communities. Thus, resistance training programs achieve many different goals, such as performance improvement, injury rehabilitation, muscle tone improvement, and strength improvement.

Explosive power is the highest rate of force development for different types of muscle movements. Training for explosive power is crucial for gaining the maximum output.

Statement of the Problem

This investigation aimed to determine the isolated and combined effects of plyometric and weight training on explosive power among basketball players.

Methodology

To achieve this purpose of the study, sixty basketball players from in and around Kottayam, Kerala, India, whose ages ranged between 18 and 25 years, were chosen as

subjects. The selected subjects were divided into four equal groups. Group – I - (n = 15) underwent plyometric training, group – II - (n = 15) underwent weight training, group – III - (n = 15) underwent combined training, and group – IV - (n = 15) acted as the control group which does not participate in any special training. This study's training program was carried out thrice weekly for twelve weeks. The selected dependent variable, explosive power, was measured by vertical jump test before and after training.

Statistical Technique

The data collected before and after the experimental periods on plyometric training, weight training, combined training, and control group were analysed and presented in the following table -I.

Table –I
ANACOVA ON EXPLOSIVE POWER OF PLYOMETRIC TRAINING, WEIGHT TRAINING, COMBINED TRAINING, AND CONTROL GROUPS

	PTG	WTG	CTG	CG	SOV	SS	df	MS	'F'
Pre-test mean	36.266	36.333	36.200	36.333	**B**	.183	3	.061	0.024
SD	1.533	1.588	1.521	1.718	**W**	142.00	56	2.536	
Post-test mean	45.200	39.533	42.466	36.466	**B**	636.98	3	212.32	83.971*
SD	1.612	1.457	1.641	1.641	**W**	141.60	56	2.529	
Adjusted post-test mean	45.216	39.486	42.546	36.419	**B**	650.76	3	216.92	87.009*
					W	13.63	55	.248	

(The table values of 2.78 and 2.77 were needed for significance at the 0.05 significance level with df 3 and 36 and 3 and 55.)

Table I displays the mean pre-test scores for the following: 36.2667, 36.3333, 36.2000, and 36.3333 for the plyometric training, weight training, combined training, and control group, respectively. Pre-test scores yielded an "F" value of 0.024, less than the 2.78 "F" value that needed to be significant at the 0.05 level. This demonstrates no appreciable differences between the groups at the beginning and that the players' random assignment into four groups was successful. The examination of the post-test scores demonstrates notable

differences between the groups; the obtained "F" value of 83.971 is higher than the necessary "F" value of 2.78. This proves that there is a significant difference among the post-test means of the subjects. Adjusted mean scores are computed and statistically treated, considering the groups' pre-and post-test results. The necessary table "F" value of 87.009 exceeds the obtained "F" value of 2.77. This demonstrates that the twelve weeks of varied training on explosive power caused a significant difference among the adjusted means.

Scheffe's confidence interval test may be used for post hoc data analysis because the findings show a considerable improvement. The findings are shown in Table II.

Table-II
POST HOC TEST SCORES ON EXPLOSIVE POWER

PTG	WTG	CTG	CG	M.D	C.I
45.216	39.486	--	--	5.73*	0.0956
45.216	--	42.546	--	2.67*	
45.216	--	--	36.419	8.797*	
--	39.486	42.546	--	3.06*	
--	39.486	--	36.419	3.067*	
--	--	42.546	36.419	6.127*	

**Significant at 0.05 level.*

A significant difference is discovered because the obtained values exceed the needed value of 0.0956, and the confidence interval must be at 0.05 levels. Figure I provides a bar graphic illustrating the ordered pre-, post-, and adjusted means of explosive power to help understand the study's findings.

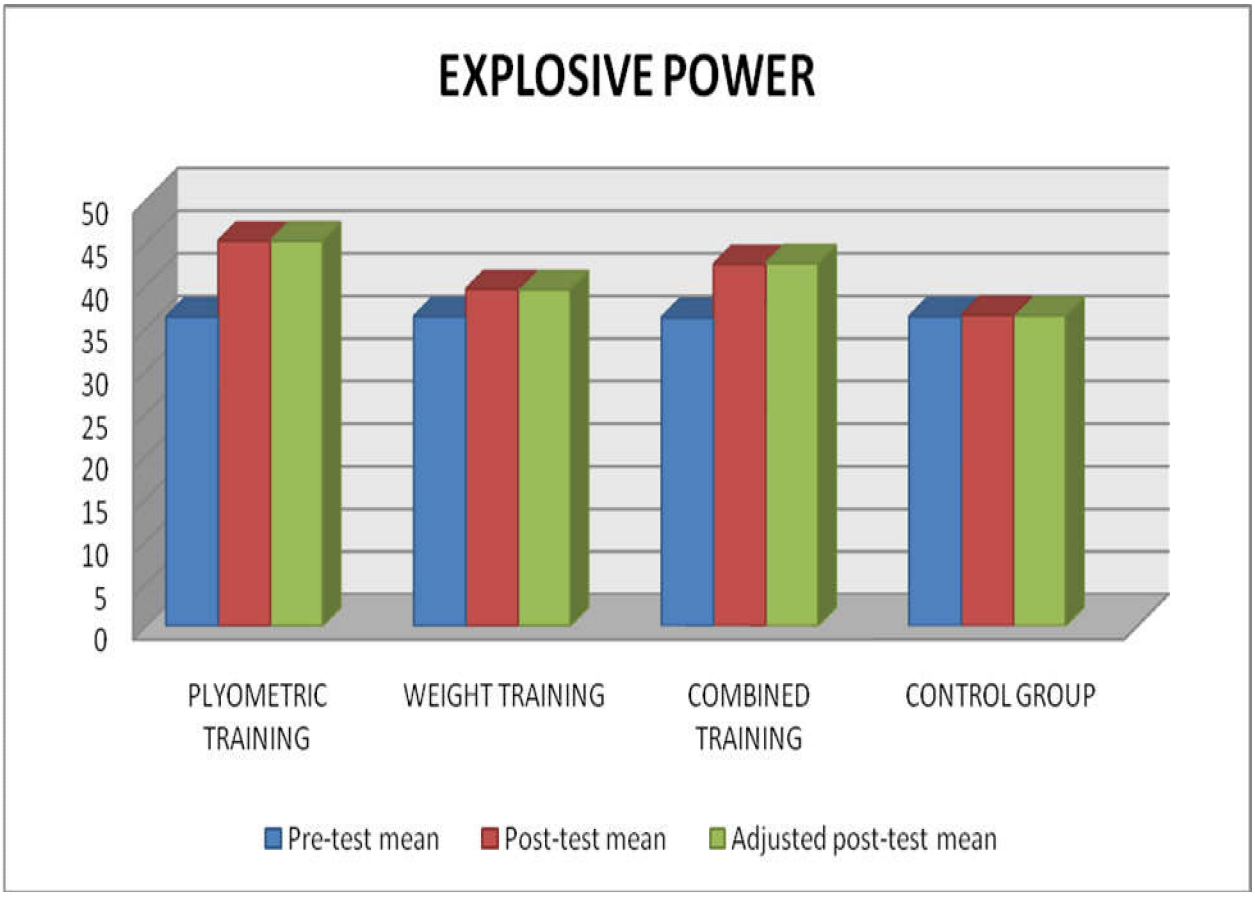

Figure I –Mean values on the explosive power of isolated and combined plyometric training and weight training group and control groups

Conclusion

The study's conclusion indicated an enormous improvement in explosive power for the three training groups compared to the control group. In addition, the results of the tests show a significant difference between the experimental and control groups in terms of explosive power. Due to the isolated and combined effect of plyometric and weight training, the explosive power of basketball players notably progressed; however, the plyometric training group was much superior to the combined and weight training group in improving the explosive power of basketball players. The combined training group was much superior to the weight training group in improving the explosive power of basketball players.

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