Effect of Weight Training on Leg Explosive Power among Football Players

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Abstract

This study aimed to assess the effects of weight training on leg explosive power among intercollegiate male football players. A total of 20 players from St. Xavier's College, Palayamkottai, Tirunelveli, Tamil Nadu, India, were randomly selected as subjects. Their ages ranged from 18 to 25 years. The participants were divided into two groups: Group A (weight training) and Group B (control), with 10 players in each. Group A engaged in weight training three times per week, with each session lasting one hour for eight weeks. The control group did not undergo any structured training but continued their regular activities. The Sarjent Vertical Jump Test was used to measure leg explosive power in centimeters. Data were collected before and after the training period and analyzed using the dependent 't' test and Analysis of Covariance (ANCOVA). The significance level was set at 0.05. The results indicated a significant improvement in leg explosive power among the weight training group, while the control group showed no significant enhancement.

Index Terms: *Weight training, leg explosive power, male football players.*

Introduction

Weight training is a structured form of resistance training designed to enhance muscular strength and endurance. It is beneficial for athletes of all levels and can be conducted in a controlled environment to ensure safety and effectiveness. Regular participation in weight training fosters long-term exercise habits, leading to sustained fitness benefits. This form of training involves using external resistance, such as dumbbells, barbells, or pulley machines, as well as body weight, to develop targeted muscle groups. It is widely used to improve explosive power and overall physical performance.

Various exercises, including bench presses, squats, sit-ups, shoulder presses, chest presses, lower back extensions, triceps presses, calf raises, and leg curls, are commonly incorporated into weight training programs. While specificity is crucial in exercise selection, a well-rounded program should include general exercises to enhance overall strength. Engaging in weight training leads to multiple benefits, including fat loss, muscle toning, and improved overall fitness. Additionally, it supports lean muscle development, enhances metabolism, and aids in calorie consumption. Strength training improves joint function, enhances balance, flexibility, stamina, and reduces the risk of injuries.

Football is the most widely played sport globally, with over 250 million participants across more than 200 countries. The game, played on a rectangular field with goals at either end, involves two teams of 11 players attempting to score by directing a ball into the opposing goal. Governed by FIFA (Fédération Internationale de Football Association), football—also known as soccer in some regions—is recognized for its dynamic and high-energy gameplay. The sport's popularity surpasses even that of the United Nations Organization in terms of member countries. Since its inclusion in the Olympic Games in 1900, football has captivated audiences worldwide, particularly in Europe, where it has a rich historical presence. However, the lack of proper technique and basic skills among beginners can lead to frustration and potential injuries, making structured training essential for skill development (Sharma & Pandey, 2007).

Methodology

The study involved 20 intercollegiate male football players from St. Xavier's College, Palayamkottai, Tirunelveli, Tamil Nadu, India, selected randomly. The participants were aged between 18 and 25 years and were divided into two groups: Group A (weight training) and Group B (control), each consisting of 10 players. Group A followed a structured weight training regimen three times per week, with each session lasting an hour for eight weeks. The control group did not engage in any specific training but continued their regular activities.

To evaluate leg explosive power, the Sarjent Vertical Jump Test was used, with measurements recorded in meters. Data collection occurred both before and after the training intervention. Statistical analysis was conducted using the dependent 't' test and Analysis of Covariance (ANCOVA), with a significance level set at 0.05. This threshold was considered appropriate for assessing the effectiveness of weight training on leg explosive power.

Results and Discussions

Table-1: Means and Dependent 'T' Test for the Pre and Post Tests on Leg Explosive Power of Experimental and Control Group

criterion variables	Test	ExperimentalGroup Mean	Control Group Mean
leg explosive power	Pre test	0.42	0.41
	Post test	0.51	0.43
	't'test	**10.22***	**1.17**

***Significant at .05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

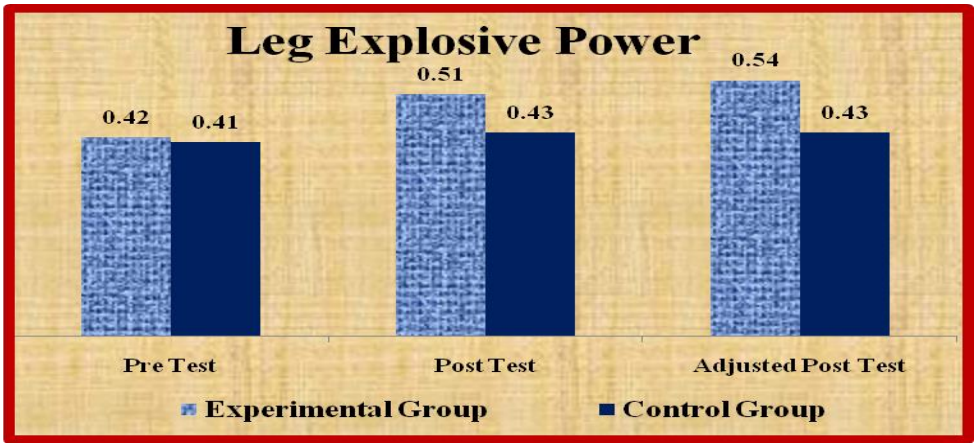
The data presented in Table 1 indicates that the pre-test mean values for leg explosive power in the experimental and control groups were 0.42 and 0.41, respectively. Following the training intervention, the post-test mean values were recorded as 0.51 for the experimental group and 0.43 for the control group. The dependent *t*-ratio values calculated between the pre-test and post-test means for the weight training and control groups were 10.22 and 1.17, respectively. The critical *t*-value for significance at the 0.05 level with 9 degrees of freedom is 2.26. Since the *t*-value for the experimental group exceeded this threshold, it can be concluded that weight training led to a significant improvement in leg explosive power compared to the control group.

Table-2: Computation of Mean and Analysis of Covariance Leg Explosive Power of Experimental and Control Group

	Experimental Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Square	F
leg explosive power (Adjusted PostMean)	0.54	0.43	BG	205.16	1	205.16	**34.08***
			WG	102.34	17	6.02	

* Significant at 0.05 level. Table value for df 1, 17 was 4.45

Table 2 presents the adjusted post-test mean values for leg explosive power, which were 0.54 for the experimental group and 0.43 for the control group. The computed F-ratio for the adjusted post-test mean was 34.08, which exceeds the critical table value of 4.45 at the 0.05 significance level with degrees of freedom (1, 17). These findings suggest a statistically significant difference between the adjusted post-test means of the weight training and control groups, demonstrating the positive impact of weight training on leg explosive power.



The bar diagram figure-1 shows that the mean values of pre, post and adjusted post tests on leg explosive power of weight training and control groups.

Discussion on Findings

The current study revealed a statistically significant enhancement in leg explosive power among intercollegiate male football players who participated in weight training. These findings align with previous studies conducted by Alwan, Thaer Fadil and Obaid, Abbas Hussein (2020), Kitamura et al. (2020), Sakthivel K. and Ramesh D. (2019), Praveenakumar, Gnanaraj, and Muthuraj (2020), as well as Raghu A. and Dr. Syam Babu M. (2011), all of which emphasized the beneficial effects of weight training on lower-body strength and power.

Weight training is widely acknowledged as an effective approach to enhancing muscular strength, neuromuscular coordination, and explosive power, which are essential for football performance. The observed improvements in leg explosive power can be attributed to the principles of progressive overload and resistance applied during training, leading to muscle hypertrophy and the strengthening of fast-twitch muscle fibers. These physiological adaptations are crucial in generating the force and speed required for explosive movements such as sprinting, jumping, and rapid directional changes—key components of football gameplay.

Furthermore, weight training enhances neuromuscular efficiency, facilitating better motor unit recruitment and improved synchronization of muscle contractions. These adaptations contribute to increased force production and power output, ultimately improving an athlete's ability to perform high-intensity movements effectively. Additionally, resistance

training strengthens connective tissues and stabilizing muscles, reducing the likelihood of injuries and enhancing overall athletic durability.

The results of this study highlight the significance of incorporating structured weight training into football conditioning programs. Given the sport's physical demands, implementing targeted weight training exercises such as squats, deadlifts, and plyometric drills can lead to substantial performance improvements.

Conclusion

Based on the findings and within the scope of this study, the following conclusions were drawn:

1. Weight training significantly improved leg explosive power among football players.
2. The control group did not exhibit any notable improvements in the selected variables.

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