



# THE IMPACT OF RESISTANCE AND PLYOMETRIC TRAINING ON A FEW SELECTED FITNESS FACTORS IN ADULT UNIVERSITY FOOTBALL PLAYERS

Nidhi Shukla, Apoorva Srivastava, Nidhi Agarwal<sup>1</sup>, Mahesh

<sup>1</sup> Faculty of Paramedical Sciences, Rama University, Mandhana, Kanpur, U.P., India

<sup>2</sup> JJT University, Jhunjhunu, Rajasthan

## ABSTRACT

**Background:-** Football is a physically demanding game where players must execute a range of abilities throughout play and require speed, strength, agility, and quickness. As a result, players must maintain a very high level of fitness to participate and prevent injuries.

**Objectives:-** This study sought to determine the effects of resistance and plyometric training on specific fitness factors in adult university Football players.

**Methods:-** Adult Football players (N = 64) were chosen at random to take part in the study. Participants ranged in age from 19 to 26 years old. A 12-week plyometric and resistance training program was implemented, with two training days and 40 minutes of training per session. These individuals were divided into two groups: Group-A: plyometric training (N = 32) group, Group B (resistance training group with N = 32). Leg strength (leg press), muscular strength endurance (sit-ups test), muscular power (standing long jump), speed (30-meter sprint), and agility (Illinois agility test) were the pre- and post-test considerations.

**Results:-** The participants' improved performance in relation to the chosen fitness variables, as indicated by the "p" values and percentages. Leg press ( $p < 0.001$ ), sit-ups test ( $p < 0.001$ ), standing long jump ( $p < 0.001$ ), 30 M sprinting performance ( $p < 0.001$ ), and agility ( $p < 0.001$ ) were the outcomes for the plyometric training group. Opposition training group: 30 M Sprinting Performance ( $p < 0.001$ ), Leg Press ( $p < 0.001$ ), Sit-Ups Test ( $p < 0.001$ ), Standing Long Jump ( $p = 0.02$ ), Agility ( $p < 0.001$ ). Resistance and plyometric training have significantly improved performance between the pre- and post-tests.

**Conclusion:-** It was also determined that, in terms of muscle power and speed, the plyometric training group had performed better. The resistance training group had demonstrated increased muscle strength, endurance, and agility.

**KEYWORDS:** Soccer, Performance, Plyometric Training, Resistance Training

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## INTRODUCTION

A very high level of fitness is required for soccer players to play without getting hurt. (1) demonstrates how difficult the soccer game is and During play, players must execute a range of talents and require strength, speed, agility, eISSN1303-5150

quickness, and other attributes. (2) notes that, depending on the intended training goals, plyometric movements—in which a muscle is recruited and then contracted rapidly—use the strength and innervations of surrounding tissue and muscles to enable faster running  
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and higher jumping. Exercise work bouts are repeatedly performed in plyometric training and are broken up with rest or recovery intervals. Furthermore, because this type of communication is discontinuous, Training might involve higher levels of exercise intensity and overall work output than continuous training. The protocol of plyometric training is highly advantageous in terms of improving speed, as well as anaerobic and aerobic endurance. Additionally, the prescription for plyometric training can be changed in terms of intensity, length of exercise period, and number of repetitions, blocks of sets each workout.

To optimize the advantages of resistance training, an adequate program and precise design training are necessary (3). Plyometric workouts take use of the stretch-shortening cycle, which has been demonstrated to improve concentric phase performance (4) and boost power output (5, 6). An essential component of health-related fitness and the amount of force that a muscle can produce is muscular strength. Exertion, which is a crucial aspect of fitness for executing motor tasks (7). Resistance training include a range of body weight exercises, free and machine weights, elastic tubing/stretch bands, and hydraulic machines. The program's main goal is to enhance muscle strength and endurance through increasing workload demand (8). All athletes can benefit from resistance training, which is important for improving performance. Athletes' dynamic upper body strength is a component of their training regimen for sports like basketball and cricket. boxers, wrestlers, judo practitioners, baseball players, etc. (9). Comparable increases in maximum strength have been demonstrated with plyometric and conventional strength training; however, the ending method seems to produce larger increases in muscle power (2). Resistance training preserves quality of life while enhancing physical performance in a variety of sports. Moreover, since muscular overload only occurs at the precise joint angles where the muscles exercised,

resistance training requires maximum range of motion (10).

Resistance exercise is essential for maintaining good health and is the main factor enhancing athletic performance in different sports ten. Resistance training raises life satisfaction (11). The primary goal of an exercise regimen is to increase physical fitness for health or sports performance, and resistance training is a crucial component of this (11). There is evidence that plyometric exercise enhances athletes' explosive actions and offers a considerable training stimulus (12). According to one of the experts, in order to enhance physical performance in elite male handball players, coaches and strength and conditioning specialists should provide more time for plyometric training during the season (13). A resistance training regimen is crucial for enhancing muscular growth and strength (14).

This study looked at the effects of resistance and plyometric training on a few different fitness characteristics in adult university football players, including leg strength, muscular strength endurance, explosive power, speed, and agility performance from pre- to post-test.

#### **MATERIALS AND METHODS**

A random selection of 64 adult Football players was made from the Physiotherapy department in Rama University Kanpur. The subjects who were chosen ranged in age from 19 to 26. The chosen individuals were split up into two groups: one for weight training (N = 32) and one for plyometric training (N = 32). The resistance training group followed a resistance training program for 12 weeks, training twice a week for 40 minutes each, while the plyometric training group followed a plyometric training plan. The following are some selected fitness variables: explosive power, speed, agility, muscular strength endurance, and leg strength. The examinations taken into consideration for Leg press, sit-ups (30 seconds), standing long jump, 30 M sprint, and Illinois agility test were the exercises used in this study. Using an

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electronic weighting machine and a stadiometer, respectively, the individuals' weight (kg) and height (m) were used to determine their BMI, which was then computed using a straightforward formula (weight in kgs / height in (m) 2). Standard sports equipment was used at the stadium to evaluate a subset of fitness factors.

Additionally, the tester recorded the data that was gathered for the pre- and post-test.

A 12-week plyometric training regimen was implemented, consisting of two sessions each week, lasting 40 minutes each. The curriculum

for the training included five minutes of stretching and warming up, followed by a few chosen plyometric training drills like depth jumping, squat jumps, and bounding.

The following was the intensity, volume, and rest: three sets of ten repetitions, ninety seconds of rest in between each set, and finally, a five-minute cool-down exercise (Table 1). The 10 exercises are as follows: parallel bench press, chest press, let pull down front, leg press, leg curls, and leg extensions. preacher curls, seated shoulder press, rowing, and triceps extensions.

**Table 1. Details of Dependent and Independent Variables**

Selected Fitness Variables
Dependent variables
Leg strength
Muscular strength endurance
Explosive power
Speed
Independent variables
Plyometric training group
Resistance training group

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In addition, the training consists of two sets of 15 repetitions each with a 30-second break in between. Exercises to warm up and cool down were advised. both prior to and following the resistance exercise regimen. The following statistical techniques were taken into consideration for the analysis of research data: mean, standard deviation, independent t-test, and percentages, which were calculated using an online calculator and SPSS 16 software.

**RESULTS**

Data on the resistance and plyometric training groups for the chosen participant fitness characteristics were analyzed.

Table 2 below shows the results from the pre- to post-test.

The following fitness variables were analysed for the plyometric and resistance training groups' members from the pre- to post-test data: leg strength (p < 0.001), muscular strength endurance (p < 0.001), muscular power (p < 0.001), speed (p < 0.001), and agility (p < 0.001).

From the pre-test to the post-test, all the chosen fitness variables for the resistance and plyometric training groups, respectively, had demonstrated substantial performance (Table 3).

**Table 2. Analysis of Data for the Selected Fitness Variables among the Participants from Pre to Post Test**

Fitness variable	PRE TEST				POST TEST		P Value
	Mean	SD	Mean	SD	Mean	SD	
Leg strength							



Plyometric training	Group - N= 64	58.09	10.21	76.35	7.08	0.001
Resistance training		57.90	10.63	84.09	19.74	0.001
Muscular strength endurance						
Plyometric training		17.25	4.06	20.85	2.67	0.001
Resistance training		17.65	4.36	22.85	3.74	0.001
Explosive power						
Plyometric training		1.60	0.14	1.84	0.24	0.001
Resistance training		1.64	0.28	1.75	0.14	0.01
Speed						
Plyometric training		5.32	0.78	4.62	0.53	0.001
Resistance training		5.4	0.74	4.98	0.48	0.001
Agility						
Plyometric training		22.12	2.33	20.90	1.43	0.01
Resistance training		23.52	1.62	20.75	1.74	0.001

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**Table 3. Percentages with Regard to Selected Fitness Variables from Pre to Post test among the Participants**

Test	Plyometric Training Group		Resistance Training Group	
	Percentages	Increase/ Decrease	Percentages	Increase /Decrease
Leg press (1 max rep)	30.34	Increase	44.45	Increase
Sit ups test (30 seconds)	14.28	Increase	27.84	Increase
Standing long jump	14.90	Increase	7.26	Increase
30 M. sprinting performance	13.12	Increase	9.26	Increase
Illinois agility test	5.26	increase	11.71	Increase

### **DISCUSSION**

Following twelve weeks of resistance and plyometric exercise, both groups' performance was significantly improved. The

aim of this study was to examine the effects of different resistance and plyometric training regimens on particular fitness metrics in adult university



football players. It is clear that each of the training regimens has a unique benefit for the many fitness variables that have been chosen, such as leg strength, muscular endurance, muscular power, speed, and agility.

Surprisingly, the study's results demonstrate that both groups significantly improved in all the chosen fitness measures between the pre- and post-tests. Additionally, both the An essential component of the training regimen is the use of training protocols like resistance and plyometric training. Additionally, it is clear that both athlete training regimens are crucial for improving sports performance and fitness levels. Furthermore, it is shown that the resistance training regimen is a very effective treatment for improving muscle and leg strength.

agility, stamina, and strength. Plyometric training protocols have demonstrated improved muscle power and speed performance. Adult Football players should acquire the necessary techniques and gain knowledge of resistance and plyometric training in order to prevent injuries and improve their performance.

Plyometric training was found to help individuals achieve higher improvements in their training regimens. relation to individuals who took part in a resistance-training program without plyometric training in terms of lower body power. These increases in lower body power are probably the result of adding plyometric training, even though the short- and long-term effects of static stretching on performance must be taken into account. The studies listed below support the current investigation; the previous study used a 12-week program with three sessions and shows that a resistance training regimen develops arm strength (15). An earlier study on healthy male college students looked into the effects of resistance exercise on muscle strength and endurance (16).

reveals in his study that the influence of different intensity of resistance training had shown improved performance among the

participants with regard to the selected fitness variables i.e. strength, anaerobic power, and explosive power. Progressive associations have been stated between strength, power, and enhanced quality of life and lower risk related to fractures, reduced morbidity, and mortality (9, 17). It is clear that the university football players benefit from the two days of plyometric and resistance training in a week.

raising the degree of fitness. The current study clearly shows that resistance training program is superior to plyometric training for improving specific fitness components, such as muscular strength, endurance, and agility.

### **CONCLUSION**

The influence of resistance and plyometric training from the pre- to post-test was shown to have significantly improved both the groups in relation to each of the chosen fitness factors, including speed, agility, muscular power, endurance, and strength in the legs.

In addition, it was determined that the plyometric training group had performed better in terms of speed and muscle power. Agility, muscular endurance, and leg strength had all improved in the resistance training group.

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