

## The Effect of 8 Weeks Plyometric Training on Some Selected Physical Fitness Development in The Case of Gojjam Debre Markos Town Amhara National League Male Football Club Players

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### ABSTRACT

The main objective of this study was to investigate the effect of 8 weeks plyometric training on the development of explosive leg power and speed physical fitness components of Gojjam Debre Markos town Amhara national league male Football club players. Plyometric training, explosive leg power and speed physical fitness components were the main target of this study. They were 25 in number but due to sport injuries 2 players were excluded whereas the remaining all 23 players were selected as the subject. For this study experimental research design was implemented and purposive sampling technique were used to select all the samples. The average ages of the participants were  $23 \pm 0.457$  years. All 23 players of the study was engaged in plyometric training like, Cone & hurdle Jumps, Multiple Jumps with a Sprint, Fast Hands/Quick Feet & zigzag running with cone for 8 consecutive weeks with frequency of 4 days per a week for 50 minutes. The physical fitness variables selected for this study was standing long jump test for explosive leg power and 30m acceleration test for speed. Pre and post field test were conducted to measure the selected variables. The data was analyzed through Statistical frequency, Paired sample T test and regression R square statistics. The finding of this study showed that Most of Gojjam Debre Markos town football club players explosive leg power and acceleration speed were categorized below the international standard level of physical fitness, after 8 weeks plyometric training explosive leg power and speed of football players were improved because the mean difference of explosive leg power was 4.62 and also the mean difference of acceleration speed was -0.24. There was a positive relationship between explosive leg power and speed after 8 weeks plyometric training because the value of R was between 0.733 (73.3%) in pre-test and 0.909 (90.9%) in post-test or it was closed to positive one.

**Key words:** Development, Football club players, Physical fitness, and Plyometric training

### BACK GROUND OF THE STUDY

Football is a high-intensity, multi-dimensional sport that is physically, mentally, technically demanding and conditioning has become an integral part of football training. Indeed, counter attacks and high-pressure defending are key parts of the high-tempo, modern-day game, and attaining high levels of fitness is critical to succeeding. Players today are quicker, stronger and greater stamina than ever before. In fact, one of major differences between top class and low-class players are the amount of high-intensity actions they perform during a game (Stolen, 2005).

Plyometric training refers to exercises involving jumping, hopping, and skipping that are characterized by eccentric contractions of the muscle-tendon unit immediately followed by concentric contractions which is also referred to as the stretch-shortening-cycle (Meylan, C et al. 2009). plyometric training helps

develop general athletic ability, ballistic skills, kinesthetic awareness, rhythm and coordination. Soccer players, especially, can benefit from the development of the power and overall athleticism provided by plyometric exercise. Soccer players need to have the ability to respond quickly and powerfully on both offense and defense (Chapman et al., 2007).

Plyometric training has many advantages for the improvement of athletes overall performance in various sport events including soccer. Plyometric training exercise improve explosive power, muscular strength, speed and quickness, agility, neuromuscular coordination, vertical jump performance, leg strength, muscular power, increase joint awareness and enhance soccer skill performances of the athletes (Roopchand M et al.2010).

Physical fitness performance is the most crucial for footballers to improve their technical & tactical performance (Keshave K. M, et al 2014) and also physical fitness needs scientific training for the purpose of developing physical characters lead to positive results (Wirhead, R; 1998).But according to the researcher previous experiences in Ethiopia football clubs specifically reference in Amhara national league football club (Gojjam Debre Markos town football club)coaches most of the time they did not focused on physical fitness components training rather to implement their traditional coaching experience training systems, because of these reason soccer players physical fitness cannot improve at the right time, therefore usually football players had a problem of jumps during a 90 min match and to perform short sprints in different game situation, it may be due to lack of plyometric training. The research hypothesis of this study were:-is there a significant difference between Gojjam Debre Markos town football club players physical fitness level with the international norm standards, Eight weeks plyometric training have a significance effect on the development of explosive leg power and speed physical fitness level of football players, After plyometric training there is a positive relationships between explosive leg power and speed physical fitness level of football players. Therefore, accordingly the study was carried out to check the effect of 8 weeks plyometric training on some selected physical fitness development in the caseof Gojjam Debre Markos town football club players.

## **MATERIALS AND METHODS**

Aiming to the effect of 8 weeks plyometric training on some selected physical fitness development in the case of Gojjam Debre Markos town football club players; this study covers 25trainees in the age of 22-24age groups, this study from the total number of 25 players only 23 participants were used as the subject but 2 players due to sport injuries were excluded.For this study experimental research design was implemented and the subject were purposefully selected to engaged 8 consecutive weeks plyometric training like, Cone & hurdle Jumps, Multiple Jumps with a Sprint, Fast Hands/Quick Feet & zigzag running with cone with frequency of 4 days per a week for 50minutes. Their average age was  $23\pm 0.457$ . All testing candidates are healthy and with no visible aberrations that might affect testing results in the research. Before directly engaged to the test the participants were requested to warm up for 15minutes prior to the test program and cooling- down for 10 minutes following the test program. Standing long jump pre- and post-field test was applied to test trainees explosive leg power, 30 meters acceleration pre and post field test was applied to test trainees speed .For the purpose of this research, and in accordance with the research aim,Statistical frequency was used to identify players physical fitness level , Paired sample T test was used to compare the main difference between pre and post field test of explosive leg power and speed and also regression R square statistics was used to identify the relationship between explosive leg power and speed.

**RESULTS**

Table 1:-Explosive leg power test before and after plyometric training

Valid		Pre test		Post test	
		Frequency	Percent	Frequency	Percent
	Above average	9	39.13	12	52.17
	Average	8	34.78	7	30.43
	below average	5	21.74	2	8.70
	Very poor	1	4.35	2	8.70
	Total	23	100.0	23	100.0

Table1:- showed that during pre-field test explosive leg power of the players were 9 (39.13%) above average, 8(34.78%) average, 5(21.74%) below average and 1(4.35%) very poor whereas in the post-test 12(52.17%) above average, 7(30.43%) average, 2(8.70%) below average and 2(8.70%) very poor. It indicated that after plyometric training there was an improvement of explosive leg power.

Table2:- 30m acceleration Speed test before and after plyometric training

Valid		Pre test		Post test	
		Frequency	Percent	Frequency	Percent
	Average	1	4.35	3	13.04
	Below average	4	17.39	2	8.70
	Poor	18	78.26	18	78.26
	Total	23	100.0	23	100.0

Table2:-Showed that during pre-field test acceleration speed of the players were 1(4.35%) average, 4(17.39%) below average and 18(78.26%) poor whereas in the post-test 3(13.04%) average, 2(8.70%) below average and 18(78.26%)very poor. It indicated that after plyometric training there was a few improvement of speed.

Table3:- Descriptive statistics of paired samples T-Test standing long jump

	Post & pre test	Paired Differences				T	df	Sig
		Mean difference	Std. Error Mean difference	95% Confidence Interval of the Difference				
				Lower	Upper			
Standing long jump test	explosive leg power post-test - explosive leg power pre-test	4.62	0.54	3.54	5.71	8.58	44	0.001

Table3:- showed that during pre and post field test of football club players paired T-Test  
 Ho: There is no significance difference b/n pre and post-test of player’s explosive leg power.  
 Hi: There is a significance difference b/n pre &post-test of players’ explosive leg power.

Since the mean difference which becomes 4.62 or the value of “p” is 0.001 which means it is less than 0.05. It indicates that there is enough evidence to reject the null hypotheses, which implies that there was a significant difference of explosive leg power physical fitness components between pre and post field test.

Table4:- Descriptive statistics b/n pre & post field test of paired T-Test 30m acceleration speed

Pre & post test		Paired Differences				T	Df	Sig
		Mean difference	Std. Error mean	95%confidence interval difference				
				Lower	Upper			
30m acceleration Speed test	Speed of 30m acceleration post & pre test	-0.24	.04	.16	.33	6.11	44	0.001

Ho: There is no significance difference between pre and post field test of players 30m acceleration speed test.

Hi: There is a significance difference between pre & post field test of players’30m acceleration speed test.

From the above table4:- the result of the mean difference which becomes -0.24 or the significance difference which becomes in to 0.001, it indicates that the value of “p” is less than 0.05 therefore we have enough evidence to reject the null hypotheses, which implies that there was a significant difference of 30m acceleration speed between pre and post-test of physical fitness components.

Table5:- Linear Regression Summary model data about the relationship between explosive leg power & speed during pre & post field test

	R	R Square	Adjusted R Square	Std. Error of the Estimate
Post field test	.909	.83	.82	.21
Pre field test	.733	.54	.53	.30

Ho: There is no a relationship b/n explosive leg power & speed during pre & post-test of the players.

Hi: There is a relationship b/n explosive leg power & speed during pre & post-test of the players.

Therefore from the above table5:- in the pre-test the value of R was 0.733 it implies that about 73.3% and in the post- test 0.909, it implies that 90.9%, Since the value of R is closed between -1 and 1 it indicates that there was enough evidence to reject the null hypotheses, which implies that there was a positive relationship between explosive leg power and speed.

**DISCUSSIONS**

The objective of this study was to determine if 8 weeks plyometric training alone or can enhance explosive leg power and speed in the case of Gojjam Debre Markos town football club players. The results indicate that 8 weeks plyometric training was capable of improving Gojjam Debre Markos football club players' explosive leg power and acceleration speed but from 8 consecutive plyometric training explosive leg power was more beneficial than acceleration speed. Similarly in the study of an experimental study conducted on the effects of plyometric and resisted jump-training on speed and explosive power of young athletes showed the greatest amount of change in vertical jump (Fatouros et al., 2000). According to Haghghi et al. (2012) noted that sprint performance was improved after 8 weeks plyometric training in young soccer players. Appropriate training schedule not only develop strength, speed, agility, power, endurance etc. but also soccer playing skill and performance in general. (Strand wick et al.2002)

There was a positive relationship between explosive leg power and speed, because the value of R in the pre-test was 73.3% and in the post test was 90.9%. It indicates that the value of R is closed between -1 & 1; this means when the value of R is closed in to -1, it implies that the variables have their own negative relationship whereas when the value of R is closed in to 1; it implies that the variables have their own positive relationship. this results supported by ( Salimi 2000), he believed that when the increase in strength or speed or both of can cause an increase in power & this leads to the athlete can do more work in shorter time. So the relationship between power and speed is expected.

## **CONCLUSIONS**

Based on the result of this study the following conclusion was made:

- ✚ Usually Gojjam Debre Markos town football club players explosive leg power and acceleration speed were categorized below the international standard level of physical fitness.
- ✚ Eight weeks plyometric training can be used to improve explosive leg power and acceleration speed in football.
- ✚ After eight weeks plyometric training there was a positive relationship between the improvement of explosive leg power and acceleration speed.

## **ACKNOWLEDGMENT**

First and for most, I give honor and praise to God for helping and enduring me from the beginning up to the end. I wish to express my sincere gratitude and appreciation to my friends; Nitsuh Alemayehu, Menigstu Anagaw and Almaz Amare whose prayers ,love and best wishes were a source of inspiration ,encouragement and motivation for me as to successfully completing this study. Finally, I also extend my appreciation to Gojjam Debre Markos town football club coaching staffs and players whose cooperation and support have made this project a reality.

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