

# EFFECT OF EIGHT WEEKS INTERVAL TRAINING PROGRAM ON THE SELECTED PERFORMANCE RELATED VARIABLES OF UNIVERSITY FOOTBALL PLAYERS

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## ABSTRACT

*The purpose of this study was to determine the effect of eight weeks interval training program on the speed and leg power of University football players. The variables investigated were age, weight, height, jump height, speed and leg power. One group pretest-posttest experimental study design were employed for the study. Three hypotheses were formulated and tested in the study. Twenty-two random selected University of Ibadan soccer players formed the sample for the study. Data collected were analyzed using the means, standard deviation and significance difference between the pretest-posttest main variables were determined using paired t-test. The alpha level was set at 0.05 level. Based on the findings, it was concluded that the interval training program increases the speed and jump height of the soccer players significantly but the leg power did not improve following the eight weeks of training session. Therefore it was recommended that the plyometric exercises in the training program should be modified in further studies for improved power performance.*

**Keywords:** interval training, speed, leg power, plyometric training, performance related variables.

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## INTRODUCTION

The history of football is a much interwoven tangle of different threads that come to make what we call football today. In many parts of the world, football evokes great passion and plays an important role in the life of individual fans, local communities, and nations. According to Reilly & Gilbourne (2003), football's growth in popularity over the past 20 years has seen a similar increase in the amount of research conducted in all fields of sports science. Amongst other sports, soccer is the most popular sport all over the world and it involves many skills that incorporate kicking, heading, passing and goal scoring which require a powerful leg muscles. The Federation of International Football Association (FIFA) World Cup, played every four years, is widely considered the world's biggest sporting event.

Interval training is a series of repeated bouts of exercise alternated with periods of relief. The training session involves a given number of work intervals, each followed by a rest or relief interval and the degree to which the ATP-PC system is restored during the relief interval is related to the duration of the relief interval. The first few weeks of football training are critical; therefore care must be taken to prevent severe muscular soreness and overindulgence (Sokmen, Beam, Witchey & Adams, 2002). Bompa and Haff (2004) suggested that an interval training session in the game of football should involve standard features of training such as warm-up, stretching, the training session proper and a cool-down. The key to successful interval training lies in utilizing the proper intensity of exercise followed by a rest interval (Reilly & Doran, 2003).

According to Kimberly (2010), speed training is a form of training designed to decrease the amount of time it takes an individual to move from one point to another during training. The current paradigm of speed development is undergoing change in the sport science community, wherein a greater emphasis is being placed not just on acceleration, top speed and speed endurance training, but also on change of direction speed drills (Sporis, Ruzic & Leko, 2008). Stolen, Chamari, Castagna and Wisloff (2005) opined that soccer depends on the athletes ability to develop high level of power. Robinson and Owens (2004) in their study on relationship between running speed and measures of vertical jump among basketball players, concluded that there was a marked relationship between sprinting speed and measures of peak power relative to the body mass. Since soccer game demands numerous explosive movements, power development will contribute greatly to economy of motion and ability to sustain lower intensity efforts. Little and Williams (2005) opined that if a muscle is required to work at maximal velocity with a high level of force then power is developed. Similarly, Shambhuulingayaswamy, Seke and Ravindram (2011) conducted a study on the influence of uphill running and downhill running on speed parameters and discovered significant improvement on speed and speed endurance between groups tested. From these latter studies, it was revealed that both strength and running related training can lead to improvement in both speed and leg power which can be a spring board for soccer players achieving optimal performance whenever the need arises. The study therefore aimed at investigating the effects of eight weeks interval training program on the speed and leg power of University of Ibadan soccer players.

## METHOD AND MATERIALS

### Population and Sample

The sample for this study, in total of 22 soccer players, were drawn from the University of Ibadan soccer players. The subjects were divided into two equal groups. All participants were physically active football players aged between 19 to 26 years throughout the period of the study.

### Procedure for Data Collection

All the tests were administered by the researchers in which recording, observing and training the subject were carried out on the field of play with the aid of research assistants. A letter of introduction for the study was obtained by the researcher from the head of department of Human kinetics and Health education, University of Ibadan to the coaches in charge of the football team. Subjects were informed of the nature of the test and each of them signed informed consents form before the commencement of training.

The main variables measured in this study were speed and leg power. An additional variable includes age, height and weight of the participants. The speed was measured by 50 meter test. The test protocol for using the instruments was followed as described by Donald (1978) in line with American Association of Health and Physical Education, Recreation and Dance youth fitness test. He reported a reliability value of 0.92 for the instruments. The leg power was measured using sergeant jump test as described by Johnson and Nelson (1986) and they reported its reliability coefficient as 0.95. The standiometer and weighing scale were used to measure height and weight. A smooth wall surface approximately 3 meters high was calibrated for the sergeant jump. Marking were distinctly made on the wall starting from 1.50 meters above the ground level. A measuring tape, scale, chalk pieces and clapper were used in the study for data collection.

### Training

The training period lasted for a period of eight weeks. The selected players were trained three times a week. All the participants were divided into two groups. The first group starts with speed training exercise while the second group begins with leg power exercises and on completion, each group interchange. The interval training comprises series of speed and leg power conditioning exercises. The intensity and duration of exercises gradually increased every two weeks, when training was assumed to have become less challenging to the physical-physiological conditioning of the players. Work interval is interspersed with relief intervals with a work ratio of 1:3. The speed training and leg power training principles were used to determining the dosage at every period of the training respectively.

The speed training modes developed for this study are described as follows.

The first part is a warm up speed training exercises and the selected exercises are as follows.

1. 15 meters sprints from crouch start: it is done at 100% efforts within 2 secs.
2. 25 meters sprints from crouch start. It is done at 100% effort within 4 sec.
3. 45 meters sprints from 3 points starts. It is done at 100% effort within 6 sec.
4. 50 meters sprints from flying start. It is done at 100% efforts at 5 secs.

The second part of speed training exercises include

1. 50 meters sprints and with a return of 40 meters jog.
2. 60 meters sprints and with a return of 40 meters jog.
3. 70 meters sprints and with a return of 40 meters jog.
4. 80 meters sprints and with a return of 40 meters jog.

The leg power training mode as the following exercises.

Similarly, the first part is a warm up exercise and the selected exercises are as follows:

1. High speed walking: Cones are placed at 1.5 meters apart. Spread out over 30 meters and the knee are made to reach hip level while walking. The second athlete starts when the first has got to 10 meters.
2. High speed jogging: it follows the same procedures as high speed walking though it is jogging.
3. Short scissors run: athletes run in a way that their legs make a scissors like pattern.
4. Butt/head kick: while jogging, the athletes kick heels to touch. Buttocks with each step.

### Procedure for Data Analysis

The descriptive statistics of mean and standard deviation were calculated for of age, height, and weight variables of the players, while inferential statistics of paired t-test was used to determine the significant difference in the pretest-posttest variables of all participants. Statistical significance was set at 0.05 alpha level.

### Research Hypotheses

The hypotheses tested in this study are as follows:

1. There will be no significant difference in the pretest-posttest speed of University of Ibadan soccer players following eight weeks of interval training.
2. There will be no significant difference in the pretest-posttest peak power of University of Ibadan soccer players following eight weeks of interval training.
3. There will be no significant difference in the pretest-posttest peak jump height of University of Ibadan soccer players following eight weeks of interval training.

## RESULTS

**Table 1: mean and standard deviation of the experimental group**

	Mean	Standard deviation	Number
Age (year)	22.36	2.19	22
Height (cm)	171.54	5.01	22
Weight (kg)	68.73	3.47	22

Table 1 showed the mean age and standard deviation of the experimental group were  $22.86 \pm 2.19$  while the mean height and standard deviation of the experimental group were  $171.54 \pm 5.01$  and the mean weight and standard deviation of the experimental group were  $68.73 \pm 3.47$ .

**Table 2: Mean and standard deviation of the pretest scores of the experimental group**

	Number	Mean	Standard deviation
Pretest 50m dash score (sec)	22	7.59	0.74
Pretest jumping height (cm)	22	274.09	0.12
Pretest power in watt	22	21735.90	893.71

Table 2 showed that the pretest 50m dash mean and standard deviation of the experimental group were  $7.59 \pm 0.74$ , pretest jumping height mean and standard deviation of the experimental group were  $274.09 \pm 0.12$  mean and standard deviation pretest power in watt of the experimental group were  $21735.90 \pm 893.71$ .

**Table 3: Mean and standard deviation of the posttest scores of the experimental group**

	Mean	Standard deviation	Number
Posttest 50m dash score (sec)	6.93	0.44	22
Posttest jumping height (cm)	296.95	0.21	22
Post power in watt	32699.64	284.43	22

Table 3 showed that the posttest 50m dash mean and standard deviation of the experimental group were  $6.93 \pm 0.44$ , the posttest jumping height mean and standard deviation of experimental group were  $(296.95 \pm 0.21)$  sec and power in watt of the experimental group were  $32699.64 \pm 284.43$ .

**Table 4: Paired T-test analysis result of the pretest-posttest scores of the experimental group**

Pairs		Paired dif mean	paired dif standard deviation	value	df	Sig (2 tailed)
Pair 1	Pretest-Posttest 50m dash (sec)	0.66318	0.76045	4.090	21	0.001
Pair 2	Pretest-Posttest Power in watt	-10963.73162	42775.49	1.202	21	.234
Pair 3	Pretest-Posttest jump height score (cm)	-.22955	.17306	6.221	21	.000*

Significant at 0.05 (2 tailed). Sec=seconds; cm=centimeters

From table 4, the calculated t-value for pretest-posttest 50m dash was 9.040 and critical t-value was 1.96 with degree of freedom 21 at a 0.05 alpha level. Therefore, there will be significant difference in the pretest-posttest speed of University of Ibadan soccer players following eight weeks of interval training. Thus, the hypothesis is confirmed significant. From table 4, the calculated t-value for pretest-posttest power in watt was 1.202 and critical t-value was 1.96 with degree of freedom 21 at a 0.05 alpha level. There will be no significant difference in the pretest-posttest peak power of University of Ibadan soccer players following eight weeks of interval training. Thus, the hypothesis is confirmed not significant. From table 4, the calculated t-value for pretest-posttest jump height was 6.221 and critical t-value was 1.96 with degree of freedom 21 at a 0.05 alpha level. There will be significant difference in the pretest-posttest jump height of University of Ibadan soccer players following eight weeks of interval training. Thus, the hypothesis is confirmed significant.

## Discussion of Findings

This study was carried out to determine the effect of eight weeks interval training on the speed and leg power of University of Ibadan soccer players. Following eight weeks of interval training, the study revealed that there was significant differences in the pretest-posttest speed and jump height of the soccer players. However, there was no significant difference in power following conversion of the jump height to wattage. Consequently, since the participants power in watt was not significant, this may suggest that there is no significant improvement in their leg power. The significant difference in speed is in conformity with findings of studies of Shambhulingayyasway, Seeker and Ravindran. (2011) and Ronnesstad Kwamme, Sunde and Reastad (2008) who reported improvement in speed following strength and running training respectively. Modern soccer game requirements can be met by maintaining a high level of endurance and power performance during the whole game (Jeffreys, 2004; Meckel, Machnai, & Eliakim, 2009). Taskin (2008) found that sprint ability is similar in all field players' positions and speed dribbling. This is also a confirmation that power performance parameters, such as the ones tested in this paper, have a low impact on soccer accomplishment.

## CONCLUSION

Based on the findings of this study, it was concluded that only speed and jump height was unequivocally resulted in significant improvement after the speed and leg power training, but was not consistently significant. Therefore it was recommended that the plyometric exercises in the training program should be modified in further studies for improved power performance.

## RECOMMENDATION

The following were recommended after the study:

1. The coaches need to be trained on the current scientific approach to football training for better coaching results;
2. There is need for players' involvement in the electronic match analysis in a computer simulated environment for mental adaptation to physical-physiological demands of the game.
3. Private-public partnership for talent identification and grassroot development programs will go a long way to checkmate brain drain in local football in Nigeria.

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