International Journal of Engineering & Technology, 7 (2.15) (2018) 158-160

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research Paper

Exploring Effective Training Methods to Improve Football Performance: Effects of Small Sided Games on Cardiovascular Endurance

Zulakbal Abd Karim[1]*, Muhammad Arif Hanis Abd Ghani[1], Ali Md Nadzalan[1]

[1]Faculty of Sports Science and Coaching, Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak, Malaysia
**Corresponding author E-mail: zulakbal@fsskj.upsi.edu.my*

Abstract

This study is aimed to examine the effects of small-sided game training on the cardiovascular endurance among football players. A total of 30 university football players were involved in this study. Participants involved in six weeks of small sided games training and Yo-Yo intermittent recovery level 1 test was conducted pre- and post-training intervention. Descriptive statistics, paired and independent t-test were conducted in data analysis. The results showed that there was a significant difference between the training group and the control group in cardiovascular endurance levels at post-intervention test. In conclusion, a small sided game training is a valuable training method to be implemented in enhancing physical abilities among football players.

Keywords: *Cardiovascular Endurance, Football Players, University, Small-Sided Game Training, Specificity*

1. Introduction

Cardiovascular endurance is one of the most important component of physical fitness in many sports including football (1-4). As a way to improve cardiovascular endurance, many training methods could be applied (5, 6).

One of the principles of training is specificity. Principles of specificity imply that, to become better at a particular exercise or skill, one should perform that exercise or skill (7). For example, a runner should run to improve running performance. A badminton player should include lunge training in his training because he had to do many lunge movements during the game (8, 9). In football, small sided training has been increasingly popular to be included as a training method to improve game specific skills besides is also trusted can improve cardiovascular endurance (10).

Research has shown that training intensity achieved through small game training is similar or higher than generic fitness training (11-13). For example, Impellizzeri et al. (13) reported that there was no significant difference between the physiological variables value such as maximum heart rate and percentage of VO2max during specific small-sided game training compared to interval training among young football players.

Training with high intensity has been shown to increase physical abilities (14, 15). As small sided games training had been shown to induce intensity that is high enough to be considered high intensity, it is the aim of this study to determine the effects of small-sided games training on one of the most important fitness components among football players that is the cardiovascular endurance. Findings of this study will give the information whether the small sided game can be a valuable method to be implemented during training session.

2. Methodology

2.1 Participants

Thirty university football players involved in this study. Participants were divided into two groups (training groups, n = 15 and control group, n = 15). Participants were free from injury to be included in this study.

2.2 Training and testing

Training groups were assigned to 3-to-3 small side game training for six weeks. Training was conducted for three times a week with approximately 20 minutes per session with intensity of 40% to 80%. Yo-Yo Intermittent Recovery Level 1 test was conducted pre- and post- training intervention. The Yo-Yo Intermittent Recovery Test Level 1 test was developed to measure an athlete's ability to repeatedly perform high-intensity aerobic work. The participants in this test have a short 10 seconds active break after each 40m (2 x 20 m runs), with the speed increasing at intervals. The level that the participant stooped will be taken as the score and converted to the distance covered in metre (m). Trained instructors were appointed to guide and calculate the levels achieved by the participants during the test.

2.3 Statistical analysis

Descriptive statistics were used to obtain the mean and standard deviation of participants' physical characteristics and mean score. Paired t-test was conducted to examine the cardiovascular endurance score within groups pre- and post-intervention while independent t-test was conducted to compare the cardiovascular endurance score between both training and control groups. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 20.

3. Results

Table 1 showed the physical characteristics of participants.

Table 1. Physical characteristics

Variables	Mean ± SD
Age (years)	20 ± 2.43
Body mass (kg)	68.21 ± 4.52
Height (cm)	173.82 ± 5.81

Table 2 and 3 showed the pre- and post-test scores among the experimental and control group.

Table 2. Experimental group

Tests	Mean ± SD	p-value
Pre-test (m)	1277 ± 238.34	0.01
Post-test (m)	1450 ± 293.12	

Table 3. Control group

Tests	Mean ± SD	p-value
Pre-test (m)	1293 ± 267.91	0.45
Post-test (m)	1312 ± 302.13	

Table 4 and 5 showed the comparison in pre- and post-test score between treatment and control group.

Table 4. Pre-test score

Group	Mean ± SD	p-value
Treatment (m)	1277 ± 238.34	0.38
Control (m)	1293 ± 267.91	

Table 5. Post-test score

Group	Mean ± SD	p-value
Treatment (m)	1450 ± 293.12	0.03
Control (m)	1312 ± 302.13	

4. Discussions

The results of the study found that the experimental group increased their cardiovascular endurance level during the post-test compared to pre-test while no significant improvement found among the control group. When compared the post-test score, we can see that the treatment group had significantly greater cardiovascular endurance compared to the control group. As this data was collected during the in-season phase, this showed small-sided training program that was implemented to the experimental group was effective and has a very good impact towards improving player's ability to retain fit in the field.

The effectiveness of the training program in this study can be linked to the principles of specificity. Players keep moving in a small space for a long times and thus, their heart was pushed to keep pumping bloods to all over the body that finally bring improvement in terms of cardiovascular endurance level that were demonstrated by the distance covered by them in this study.

The uniqueness of the small sided games compared to the traditional methods of cardiovascular training method is that, players keep themselves with the skill practice. This is one of the ways to save players time. Traditional training method just requires the players to run maybe round the field for several laps without improving their skills with the balls.

Findings of this study is hoped to be beneficial for the coaches in order to plan good training programs for their players. As research article is one of the sources of references for the coaches to enhance their knowledge in coaching (16-19), researchers are encouraged to perform more studies on football training methods so that the sources will keep increasing in order to help the development of football performance.

5. Conclusion

In conclusion, small sided game would be a great alternative of training method to be implemented to the football players.

Acknowledgement

This study was part of research funded by the Sultan Idris Education University (Code: GPU 2017-0019-106-01).

References

[1] Hoff J, Helgerud J. Endurance and strength training for soccer players. Sports medicine. 2004;34(3):165-80.
[2] Marcos MA, Koulla PM, Anthos ZI. Pre-season maximal aerobic power in professional soccer players among different divisions. The Journal of Strength & Conditioning Research. 2017.
[3] Nara K. A study of physical fitness between basketball and football players of Haryana. 2017.
[4] Md Noor A, Karim ZA, Hazley F, Nadzalan AM. The effectiveness of "Small, Medium and Big Games" training on cardiovascular endurance among university football llayers. International Journal of Academic Research in Progressive Education and Development. 2017;6(4):157-62.
[5] Haff GG, Triplett NT. Essentials of Strength Training and Conditioning 4th Edition: Human kinetics; 2015.
[6] Milanović Z, Sporiš G, Weston M. Effectiveness of high-intensity interval training (HIT) and continuous endurance training for VO 2max improvements: a systematic review and meta-analysis of controlled trials. Sports medicine. 2015;45(10):1469-81.
[7] Fleck SJ, Kraemer W. Designing Resistance Training Programs, 4E: Human Kinetics; 2014.
[8] Nadzalan AM, Mohamad NI, Lee JLF, Chinnasee C. The effects of step versus jump forward lunge exercise training on muscle architecture among recreational badminton players. World Applied Sciences Journal. 2017;35(8):1581-7.
[9] Nadzalan AM, Mohamad NI, Low JFL, Tan K, Janep M, Hamzah S. Kinetics analysis of step and jump forward lunge among badminton players. Journal of Fundamental and Applied Science. 2017;9(6S):1011-23.
[10] Halouani J, Chtourou H, Gabbett T, Chaouachi A, Chamari K. Small-sided games in team sports training: A brief review. The Journal of Strength & Conditioning Research. 2014;28(12):3594-618.
[11] Dellal A, Chamari K, Pintus A, Girard O, Cotte T, Keller D. Heart rate responses during small-sided games and short intermittent running training in elite soccer players: a comparative

study. The Journal of Strength & Conditioning Research. 2008;22(5):1449-57.
[12] Hill-Haas S, Coutts A, Rowsell G, Dawson B. Generic versus small-sided game training in soccer. International journal of sports medicine. 2009;30(09):636-42.
[13] Impellizzeri FM, Marcora SM, Castagna C, Reilly T, Sassi A, Iaia F, et al. Physiological and performance effects of generic versus specific aerobic training in soccer players. International journal of sports medicine. 2006;27(06):483-92.
[14] Purkhús E, Krustrup P, Mohr M. High-Intensity Training Improves Exercise Performance in Elite Women Volleyball Players During a Competitive Season. The Journal of Strength & Conditioning Research. 2016;30(11):3066-72.
[15] Costigan SA, Eather N, Plotnikoff R, Taaffe DR, Lubans DR. High-intensity interval training for improving health-related fitness in adolescents: a systematic review and meta-analysis. Br J Sports Med. 2015:bjsports-2014-094490.
[16] Karim ZA, Nadzalan AM. Malaysia Football Coaches: Development Characteristics. International Journal of Academic Research in Business and Social Sciences. 2017;7(9):305-12.
[17] Karim ZA, Nadzalan AM. The development of coaching knowledge among Malaysian accredited football coaches. International Journal of Academic Research in Progressive Education and Development. 2017;6(4):113-27.
[18] Karim ZA, Razak ANA, Nadzalan AM. Designing Model of Career Path Development for National Football Development Program (NFDP): Directions, Issues, Challenges and Sources of Knowledge that Influence and Develop Coaching Expertise Level. International Journal of Academic Research in Business and Social Sciences. 2018;8(3): 542-50.
[19] Salleh OM, Nadzalan AM, Mohamad NI, Rahmat A. Repeated Sprint Ability Depending on the Level of Condition among University Soccer Players. International Journal of Academic Research in Business and Social Sciences. 2017;7(6):506-14.