

Cardiovascular Endurance Profile Of Male Soccer Players Under 18 Years Old In Secondary School In Perak, Malaysia

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Abstract: Awareness and understanding concerning healthy life style is fundamental either individually or in the society. Unhealthy individual or society will result in daily activity problems associated with physical, mental and also intellectual. The purpose of this research is to obtain the cardiovascular endurance profile among football players less than 18 years of age in one of the secondary school in Perak, Malaysia. Yo-Yo Test was used to collect the data. Result found that they were in the lower range of cardiovascular endurance as compared to Norms.

Keywords: cardiovascular endurance, profile, soccer players

1. INTRODUCTION

According to Corbin and Lindsay [1], physical fitness was defined as overall human organism fitness that is well-functioned and efficient. Physical fitness comprise of eleven component that may contribute to life quality in total and closely related to the ability of individual not only to work competently, enjoy recreational activity, being healthy, avoid hypokinetic diseases but also able to face emergency situations. In general, physical fitness covers every aspect of fitness component including nutrition and active lifestyles. There are two major fitness components namely physical fitness health based and physical fitness motor-behaviour based. Among physical fitness health based are body composition, cardiovascular endurance, flexibility, muscular endurance and muscular strength. Meanwhile physical fitness in motor-behaviour based comprised of agility, balance coordination, power, reaction time and speed. Cardiovascular endurance is the most vital and important physical fitness. Apart from that, other components include muscular endurance, muscular strength, flexibility and body composition. Cardiovascular endurance is measured in how much oxygen is being carried in the blood and pumped by the heart to the whole working muscles [2]. Improved in cardiovascular fitness denote improved in the heart's ability to deliver oxygen to all the working muscles. Soccer is among the sports that need outstanding levels of cardiovascular endurance because the game lasted for ninety minutes in which the nature of the game requires high physical demands as a result of multiple intense activities including jumps, turns, tackles, high-speed runs and sprints [3, 4, 5, 6, 7]. High cardiovascular endurance in soccer also needed to generate speed and strength during the game [8]. Soccer is being played on grass field with the area of 100-110 m length and 64-75 m wide with 11 team

members. High cardiovascular endurance is essential in order for the players perform to their very best [9].

Regular physical activity and high cardiovascular endurance has been related to improved performance in memory and executive control thus intervention training in general resulted in improved cognitive function [10]. Aerobic fitness is related to one's ability to do physical activity ranging from moderate to high intensity involving large muscle groups for longer duration. Competency of both the cardiovascular endurance and muscular endurance to operate, not only to deliver but also to utilise oxygen in the cellular levels to produce energy as a final product is crucial [11]. The purpose of this study was to find out the level of cardiovascular endurance among soccer players under 18 years of age.

2. MATERIALS AND METHODS

This study was designed as descriptive approach which describes the characteristics of the population or phenomenon that is being studied. Data are presented as mean \pm standard deviation to describe the variance between the subjects.

In this study, 20 participants less than 18 years old were recruited from one of the schools in Perak district. Each one of them is given a form to fill up and at the same time subjects were briefed about the protocol in the study and later sign the consent form. Yo-Yo test [12] was conducted on all the subjects. Subjects were required to run between 2 markers placed 20 meter apart back and forth following audio cues which dictate the running speed required. The subjects have an active break of 10 seconds after each 40 meters run before running 40 meters again. At regular intervals, the required running speed increases. The test continues until the participants are no longer able to keep up with the required pace until exhaustion.

The mean and standard deviation for the demography data and cardiovascular endurance $\dot{V}O_{2max}$ were analyzed using IBM SPSS Statistics ver. 23.0 (IBM Co., Armonk, NY, USA). The significance level was considered at $p \leq 0.05$.

3. RESULTS AND DISCUSSION

Based on the date collected, the demographic showed all the subjects age were 16.60 ± 0.50 years old. The heights were 167.2 ± 4.33 cm and their weights were 55.30 ± 7.52 kg. For the level of VO_2 max, all the subjects were in the poor level of cardiovascular endurance (14.01 ± 0.81) shown in Table 1 as compared to norms [12] as shown in Table 2.

Table 1: Demographics subjects and VO_2 max Profile

Demography	Average \pm Standard Deviation
Age (years)	16 .60 \pm 0.50
Weight (kg)	55.30 \pm 7.51
Height (cm)	167.2 \pm 4.33

VO ₂ max (level)	14.10 ± 0.81
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Table 2: Norms for VO₂ max values in Yo-Yo test

Average level and shuttle			
Level	Men		VO ₂ Max ml/kg/min
	Distance	Level	
Elite	>2400	>20.1	56.56-60.93
Excellent	2000-2400	18.7-20.0	53.20-56.56
Good	1520-1960	17.3-18.6	49.17-52.86
Moderate	1040-1480	15.7-17.2	45.14-48.83
Poor	520-1000	14.2-15.6	40.77-44.80
Very poor	<520	<14.2	36.74-40.77

Yo-Yo R1 test is considered the most appropriate measure of aerobic conditioning for sports such as soccer as compared to the VO₂max test alone which was found to be not sensitive enough to measure fitness levels in intermittent sports. It was found that 10 weeks of high intensity interval training three times per week in junior varsity soccer players improves their cardiovascular endurance as quantified by Yo-Yo IR1 Test [14]. Improvements in aerobic power have been shown to affect the number of sprints, involvements with the ball, and distance covered during a soccer match [15]. The aerobic energy system plays a vital function in the improvement of lactate removal during the low-intensity phases and in sparing muscle glycogen stores while running at different speeds [5, 12]. This is in line with other researchers findings in which cardiovascular endurance was improved in the distance covered by 26 ± 18 % measured by using Yo-Yo IR1 test in elite youth soccer players after 18 weeks of half soccer season which prescribed the players performed 92 ± 10 training sessions [17].

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