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Association among anthropometric, physiological and physical fitness variables of youth footballers at Sri Lanka

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Abstract
The present study aims to find out the association among anthropometric, physiological and physical fitness variables with playing ability of youth footballers at Sri Lanka. The study was conducted for boys aged from 18 to 28 years represented 41st national sports festival competition 2015at Sri Lanka. The players participated from nine province for national sports competition in Football (180 players) were identified as subjects for this study. The Football playing ability was selected as dependent variable and assessed by subjective rating. The Muscular Strength, Muscular Endurance, Cardio Respiratory Endurance, Flexibility, Agility, Elastic Power, Height, Weight, Upper Arm Relaxed Girth. Fore Arm Girth, Chest Girth, Wrist Girth, Waist Girth, Thigh Girth, Calf Girth, Angle Girth, Acromiale Raiale Length, Raialesylion Dactylion, Midstylion Dactylion Length, Foot Length, Leg Length,. Forced Expiratory Volume in One Second and VO2 Max were selected as independent variables and tested by standardized procedure. The data collected for playing ability and other selected independent variables. In order to examine the association between playing ability and selected independent variables simple correlation was calculated (P>.05). The result of present study shown significant association with football playing ability and the selected criterion variables among Sri Lankan foot ball players.

Keywords: Anthropometric, physiological, physical fitness, football, playing ability

Introduction
Sports talent may be identified from the Sri Lankan youth when they show interest in different sports. Identification and selection of talented youth for sports are not straightforward operations. In developed countries like USA and Australia identification of sports talent is performed scientifically. However, lack of scientific knowledge and infrastructural facilities for identification of sports talent, result into poor performance of Sri Lankan athletes at international arena. Anthropometric, physical and cardio respiratory fitness profiles contribute to selection procedures in different sports events [Payne, 2000] [10]. Besides success in track and field discipline is based on the synthesis of anthropometric characteristics and motor abilities as well as optimal technique. But overall characteristics are also influenced by genetic inheritance, morphology, and personal interest and habitual activity. Cardio respiratory fitness variables such as maximal aerobic capacity, heart rate, blood pressure and pulmonary functions reflect the overall capacity of the cardiovascular and respiratory systems and the ability to carry out prolonged exercise. Hence, Cardio respiratory fitness has been considered as a direct measure of the physiological status of the individual [Manna, 2002] [12].
The gold standard for the measurement of cardio respiratory fitness is the maximal oxygen uptake (VO2max). The level of cardio respiratory fitness is highly associated with the performance of other physical fitness parameters such as strength and power output in young people and in adults [Ortega, 2008] [8]. To identify athletic potentiality, norms of the anthropometric, physical and cardio respiratory fitness profiles have an importance because they represent the achievement level of a particular group to which observed score can be compared. Various factors like socio-economic condition, diet, physical activity may reflect on these measurements. Thus there is a wide range of normalcy and the need to develop local norms has been emphasized. Several studies have been carried out on the physical and Cardio respiratory fitness status of the children of school-age populations [Reilly, 1990] [4].

In Sri Lanka, limited studies on the anthropometric, physical, and cardiorespiratory fitness of youth have been reported. In view of the above, a study was undertaken to investigate the relationship between anthropometric, physiological and physical fitness variables with football playing ability of Sri Lankan national level football players.

Methodology

The purpose of the study was to find out the association between football playing ability and selected anthropometric, physiological, and physical fitness variables of Sri Lankan men football players. To achieve this purpose the population and sample were identified from 41st Sri Lankan sports festival. The players participated from nine province (Central, Eastern, North Central, Northern, North Western, Sabaragamuwa, Southern, Uva and Western) for national sports competition (2015) in Football (180 players) were identified as subjects for this study. The age of the subjects ranged between 18 and 28years as per the eligibility proforma of the individual. The Football playing ability was selected as dependent variable and assessed by subjective rating. The Muscular Strength, Muscular Endurance, Cardio Respiratory Endurance, Flexibility, Agility, Elastic Power, Height, Weight, Upper Arm Relaxed Girth. Fore Arm Girth, Chest Girth, Wrist Girth, Waist Girth, Thigh Girth, Calf Girth, Angle Girth, Acromiale Raiale Length, Raialesylion Dactylion, Midstylion Dactylion Length, Foot Length, Leg Length,. Forced Expiratory Volume in One Second and VO2 Max were selected as independent variables and tested by standardized procedure. The data were collected for playing ability and other selected independent variables. In order to examine the relationship between playing ability and selected independent variables simple correlation was calculated (P>.05).

Results

Table 1: mean, standard deviation and correlation between performance and selected predictor variables among football players

S. No	Variables	Mean	S.D	'r' Value	Sig
1	Perfom.	6.63	1.09	1.000	-
2	MST	30.96	3.41	.382	.000
3	SED	38.13	3.78	.505	.000
4	CRE	79.56	2.92	.520	.000
5	FLEX	29.91	1.92	.406	.000
6	AGI	18.19	.98	.009	.452
7	EX.P	11.31	.61	.414	.000
8	HT	1.69	.04	.591	.000
9	WT	68.08	4.57	.199	.004
10	UAR	29.10	2.03	.437	.000
11	FA	29.82	3.04	.356	.000
12	CHE	76.86	2.62	.269	.000
13	WRI	17.29	1.19	.265	.000
14	WAI	70.26	3.47	.383	.000
15	THI	54.31	4.82	.418	.000
16	CAL	32.33	3.79	.404	.000
17	ANG	19.73	1.48	.311	.000
18	UAL	27.96	2.01	.230	.001
19	FAL	29.75	1.65	.311	.000
20	HAN	19.90	2.18	.192	.005
21	FOOT	30.69	2.24	.226	.001
22	LL	84.04	2.42	.478	.000
23	FEV_1	4.21	.19	.498	.000
24	VO_2– Max	4.61	.25	.524	.000

From the table it is clear that except Agility, all the selected (Muscular Strength, Muscular Endurance, Cardio-Respiratory Endurance, Flexibility, Elastic Power, Standing Height, Body Mass (Weight), Upper Arm Relaxed Girth, Forearm Girth, Chest Girth, Wrist Girth, Waist Girth, Thigh Girth, Calf Girth, Ankle Girth, Upper Arm Length, Forearm Length, Hand Length, Foot length, Leg Length, Forced Expiratory Volume in 1 sec size (FEV_1) and VO_2– Max) are having significant correlation with playing ability at 0.05 level of confidence.

Discussion

The result of present study was significantly correlated between the selected criterion variables and playing ability. There are numerous studies which were is supported the result of this study. Ajay (2015) [1] found correlation between Explosive Strength, and Agility of football male players. There exists a significant relationship between Explosive Strength and Agility of male football players. Sawyer (2002) [2] studied relationship between football playing ability and selected performance measures. The findings of this study are discussed in relation to the strength and conditioning programs that facilitate the capacity for football players to develop forceful and rapid concentric action through plantar flexion of the ankle, as well as extension of the knee and hip, may be highly profitable. Vishaw Gaurav, (2015) [3] compared selected physical fitness components among male football players of different playing positions and the result of the same found significance among playing positions and insignificance found between variables. Hannele Forsman and others, (2016) examined which technical, physiological, tactical and psychological characteristics at age 15 years contribute to successful soccer performance at age 19 years. Technical, physiological, tactical and psychological characteristics were recorded when players were 15-year olds. Binary logistic regression analysis showed that performance level at age 19 was clearly associated with technical skills of passing and cantering as well as agility and motivation levels recorded at age 15 years. These results extend our understanding of career progression in youth soccer and highlight the multidimensional nature of talent development processes in soccer. Magalhães, *et al*, (2014), described the anthropometric and physical fitness profiles of elite soccer players acting in the United Arab Emirates.

Conclusion

Based on the results, it was concluded except agility all the independent variables selected for this study was positively correlated with football playing ability.

Implications

- The coaches are suggested to consider not only the sports skills but also to include anthropometric, physiological and physical fitness quality of the players while selecting on screening.
- The sports talent identification drive should be made with the help of anthropometric, physiological and physical fitness variables.

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