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Relationship between selected anthropometric variables and performance of volleyball players at Sri Lanka

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Abstract

The present investigation finds the relationship between selected Anthropometric variables and performance of youth volleyballers at Sri Lanka. The study was conducted for boys aged from 18 to 28 years represented 41st national sports festival competition 2015 at Sri Lanka. The players participated from nine provinces for national sports competition in volleyball (108 players) were identified as subjects for this study. The volleyball playing ability was selected as dependent variable and assessed by subjective rating. The Height, Weight, Upper Arm Relaxed Girth, Fore Arm Girth, Chest Girth, Wrist Girth, Waist Girth, Thigh Girth, Calf Girth, Angle Girth, Acromiale Raiale Length, Raialesyion Dactyl ion, Midst lion Dactyl ion Length, Foot Length and Leg Length 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 association between playing ability and selected independent variables simple correlation was calculated ($P > .05$). The results of present study have shown significant association with volleyball playing ability and the selected criterion variables.

Keywords: Anthropometric, playing ability, correlation, volleyball

Introduction

Anthropometric measurements are widely used to assess and predict performance in various sports. Anthropometric measurements and morphological characteristics play an important role in determining the success of a sportsperson (Wilmore & Costill, 1999; Keogh, 1999). An athlete's anthropometric and physical characteristics may represent important prerequisites for successful participation in any given sport (Gualdi-Russo & zaccagni, 2001) [8] Indeed, it can be assumed that an athlete's anthropometric characteristics can in some way influence his/her level of performance, at the same time helping to determine a suitable physique for a certain sport (Carter & Health, 1990) [3]. It has been well established that specific physical characteristics or anthropometric profiles indicate whether the player would be suitable for the competition at the highest level in a specific sport (Claessens *et al.*, 1999; Reilly *et al.*, 2000; Gabbett, 2000; Slater *et al.*, 2005) [5, 6]. Sports play a very prominent role in the modern society.

At present, the sports competitions are highly competitive and challenging. Human beings by nature are competitive and ambitious for their excellence in all athletic performance. Every sportsman or nation wants to show their supremacy by challenging other nations by showing dominance and supremacy in sporting performance in international competitions. Thus this challenge stimulates, inspires and motivates all the nations to sweat and strive to run faster, jump higher, throw far and exhibit greater strength, endurance and skills in present competitive sports world. This can only be possible through scientific, systematic and planned sports training as well as channelizing them into appropriate games and sports by finding out their potentialities. (Karfs and Daniel (1969). Volleyball players require well-developed muscular strength, power and endurance, speed, agility, and flexibility, and have a high level of jumping ability, fast reaction time and swift movements (She 1999).

Volleyball player requires more explosive in the lower limbs this is especially emphasized in the front row hitting positions when attacking on offense or blocking on defence. Vertical jump is an anaerobic explosive movement that requires recruitment of the highest threshold

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motor units (Amasay, 2008) ^[1], Vertical jump is a major determinant of volleyball performance and many researchers have studied different aspects of vertical jumping. According to Gutierrez & Marcos (2009) ^[9], the factors that affect vertical jump are height reached by the center of gravity, time required for execution, and the spatial orientation of the corporal segments. Arm span and standing reach height have also been suggested as essential factors for higher spiking and blocking (Zeng, 1992). Arm span is closely related to most of the volleyball techniques, especially in attacking. To make full use of the spiking speed of a waving arm, a long arm is an advantage. Jin and colleagues suggested that standing reach height should be used as an essential criterion in recruitment of volley ball players (Jin *et al.*, 2007) ^[10]. Hence the present study was under taken to find out the correlation between selected anthropometric variables and playing ability of the volleyball players.

Methodology

To achieve the purpose the study was conducted for boys aged from 18to28 years represented 41st national sports festival competition 2015 at Sri Lanka. The players participated from nine provinces for national sports competition in volleyball (108 players) were identified as subjects for this study. The volleyball playing ability was selected as dependent variable and assessed by subjective rating. The 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 and Leg Length 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 association between playing ability and selected independent variables simple correlation was calculated ($P>.05$).

Results

Table I: Mean, Standard Deviation and Correlation between Performance and Selected Predictor Variables among Volleyball Players

S.No	Variables	Mean	S.D	'r' Value	Sig
1.	Perfom.	6.62	1.10	1.000	-
2.	HT	1.69	.04	.282	.002
3.	WT	67.50	2.98	.354	.000
4.	UAR	28.35	1.64	.367	.000
5.	FA	29.48	1.35	.313	.000
6.	CHE	76.54	3.21	.533	.000
7.	WRI	16.85	.71	.316	.000
8.	WAI	70.76	2.76	.091	.175
9.	THI	53.22	4.12	.470	.000
10.	CAL	31.26	2.36	.382	.000
11.	ANG	19.17	1.98	.431	.000
12.	UAL	30.05	2.33	.442	.000
13.	FAL	30.45	3.78	-.191	.024
14.	HAN	23.93	1.78	.253	.004
15.	FOOT	30.56	3.09	.426	.000
16.	LL	85.57	3.71	.441	.000

From the table it is clear that except Waist Girth and FAL all the selected (Standing Height, Body Mass (Weight), Upper Arm Relaxed Girth, Forearm Girth, Chest Girth, Wrist Girth, Thigh Girth, Calf Girth, Ankle Girth, Upper Arm Length, Hand Length, Foot length and Leg Length) are having significant correlation with performance at 0.05 level of

confidence. The result also shows negatively correlation between performance and FAL.

Discussion

The results of present study have a significant association between the selected criterion variables and playing ability. There are numerous studies which were supported the result of this study. The studies on the morphological aspects of volleyballers have revealed that the body mass and height of the players bear high relationship. A study on the Western Australian Mean and Women volleyball player’s has found out that performance in this game betters with an increase in height and body musculature. The height of a volleyball player has been considered as the most important per-requisite and positive pre-disposition for better performance (Kansal *et al.*, 1983, Bale, 1986) ^[2].

Dupler, (2010) examines anthropometric and performance among school footballers and the result found that senior players have significantly high anthropometric profile as well as the performance related variables. Strudwick, (2002) describe anthropometric and performance characteristics of elite players in two football codes. The intra-group variability on the anthropometric and performance measures of the soccer players is likely to be due to the specificity of positional roles. The combined groups could be described as lean and muscular with a reasonably high level of capacity in all areas of physical performance. The research by Japan Volleyball Association demonstrated the significant correlation between the vertical jumping index and the competitive ability of the volleyball players. Body mass correlates well to muscle size and power in elite athletes. It has been reported that Katoly index correlates well to the quantity and strength of muscles (Gai & Li, 2002) ^[7].

Conclusion

Based on the results, it was concluded that most of the anthropometric variables selected for this study was positively correlated with volleyball playing ability. The multi-dimensional test battery may be effective method to assess talents in specific sports. The study provides the large and updated database on anthropometric variables among national players. Such a reference is essential for clubs and federations to assist talent selection and promotion.

Implications

The volley ball talent identification or scouting will not be respected with sports skills but also extended to anthropometric characters of the individual. It is advocated that, talent identification and development programme should be dynamic and interconnected taking into consideration maturity status and the potential to develop rather than to exclude children at an early age.

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