

Analysis of Selected Anthropometric Measurements among All India Inter University Football Players

Kiran Kumar H. K.^{1*} Shivarama Reddy M.² Ravindran G.³

¹Director of Physical Education, M. S. Ramaiah Institute of Technology, Bangalore

²Director of Physical Education, B.M.S. College of Engineering, Bangalore

³Professor & Director, Dept. of Physical Education and Sports Sciences, Annamalai University, Chidambaram

Abstract – The study was intended to analyze the selected anthropometric measurements among all India inter university football players. 165 football players from 9 universities, those participated in the All India Inter University football tournament held in Kottayam during the last week of December 2013, were selected as subjects with an informed consent. The age of the selected subjects ranged from 18 through 25 years. The selected subjects were categorized as successful team players (N = 58) and less successful team players (N = 107), and furthermore the subjects were documented for their playing positions (Forwards - 48; Midfield - 41; Defenders - 58; and Goal keepers - 18). The study was restricted to the selected anthropometric measurements, such as: standing height and body mass. The data thus collected from successful and less successful soccer players of different playing positions have been analyzed by two-way analysis of variance, simple effect tests, and post hoc tests. The results show that significant difference on height of the players exists between successful and less successful soccer teams, with regard to midfielders. It was also noted that significant difference on height exists among different positional soccer players categorized as less successful players, of which goal keepers are tallest and midfielders are shortest. However, the results also exhibited that statistically no significant difference on body mass for groups irrespective of playing positions, for playing positions irrespective of groups, and for the interaction of groups and playing positions.

INTRODUCTION

In today's age of scientific knowledge man is making rapid progress in all walks of life and it is true in the area of games and sports. Sports performance is indeed an aspect of complex human performance, which has several dimensions. Sports scientists often acknowledge that a world-class performance is the result of several factors, advocating a multidimensional approach in studies on talented players (Regnier *et al.*, 1993; Reilly *et al.*, 2000). Burwitz *et al.* (1994) also recommend interdisciplinary performance-related sports science research.

Successful performance in sports is influenced by morphological and anthropometric characteristics such as body size and composition, functional parameters (*physical capacity*) (Scott, 1991; Singh *et al.*, 2010) and fitness (*strength, speed, anaerobic and aerobic capacity, agility*) (Nikitushkin & Guba, 1998).

A group of all talented players is relatively homogeneous with regard to their performance level.

As a consequence, measures of general performance characteristics are usually not sensitive enough to detect differences between elite and sub-elite players (Bangsbo & Lindquist, 1992). Yet, there are major individual differences in the physical demands of a player in part related to the position in the team. A number of studies have compared playing positions (Reilly & Thomas, 1979; Ekblom, 1986; Bangsbo *et al.*, 1991; Bangsbo, 1994).

There are many participants in youth soccer and many levels of competition. Comparisons of the growth status of young players at the local level may provide a different picture than comparisons of more elite players of the same age at national or international levels. Growth status refers to size attained at a given chronological age (CA), most often as height and weight. Many youths participate in soccer programmes for a year or several years, and then move on to other activities as interests change, as skill demands become greater with higher levels of

competition, and as competitive sport becomes more selective and exclusive.

Several researches focused their attention on the anthropometric features of elite athletes that seems characteristic for specific sports (Gualdi-Russo & Zaccagni 2001). Hence, it is important to determine the anthropometric features of soccer players as it is related to sports performance. Stature and body mass are two of the body dimensions used primarily to monitor growth status.

Stature is not as important in soccer as it is in some other sports. This is evident by the success that has been achieved by some relatively short players at the international level. However, it is often the case at the youth level, that the taller and more physically mature individuals are often chosen for select teams and are provided with better coaching and more exposure to the sport because they are perceived to be the better players.

Indeed, research in male professional soccer has shown that the physical characteristics of players (Nevill, Holder, & Watts, 2009) and the fitness demands in official competition have substantially evolved over recent decades (Strudwick & Reilly, 2001).

It would be of interest to investigate the difference on selected anthropometric measurements among different playing positions of successful and less successful football team players, as there has been a scanty of research with regard to it. Hence, the investigator is provoked to determine whether stature and body mass varies among different playing positions, and that of success level. The present paper was proposed to analyze the selected anthropometric measurements among all India inter university football players.

METHODS AND PROCEDURES

One hundred and sixty five (165) football players from nine (9) universities, those participated in the All India Inter University football tournament held in Kottayam during the last week of December 2013, were selected as subjects with an informed consent. The age of the selected subjects ranged from 18 through 25 years. The selected subjects were categorized as successful team players (N = 58) and less successful team players (N = 107) based on their team’s tournament standings, and furthermore the subjects were documented for their playing positions (*Forwards - 48; Midfield - 41; Defenders - 58; and Goal keepers - 18*).

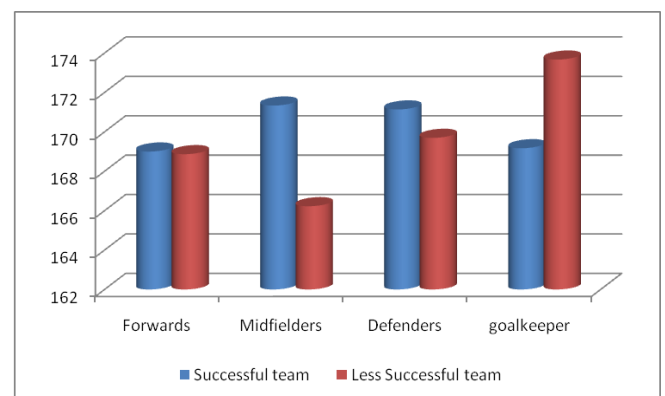
The study was restricted to the assessment of selected anthropometric measurements, such as: standing height and body mass utilizing stadiometer and spring scale weighing machine.

The experimental design used in this study was stratified group design involving convenient sampling. The data thus collected from successful and less successful football players of different playing positions have been analyzed by two-way analysis of variance, simple effect tests, and post hoc tests. In all the cases level of confidence was fixed at 0.05 for significance.

RESULTS OF THE STUDY

The mean values on standing height among different playing positions of successful and less successful football team players are graphically illustrated in figure-1.

Figure 1: Graphical Representation of the Mean Values on Standing Height among Different Playing Positions of Successful and Less Successful Football Team Players



The data on standing height have been analyzed by two-way factorial ANOVA (2x4) and the obtained results are presented in Table-1.

Table – 1: Two Way Factorial ANOVA on Standing Height

Source	Sum Squares	df	Mean Square	F	Sig.
Groups	9.004	1	9.004	.367	.546
Positions	130.368	3	43.456	1.771	.155
Groups * Positions	273.192	3	91.064	3.711	.013
Error	3852.656	157	24.539		

It is observed from Table-1 that no significant differences exist between groups (*successful and less successful*) irrespective of playing positions on standing height. Per se, no significant differences exist between playing positions (*forwards, midfielders, defenders, & goalkeepers*) irrespective of groups on standing height. However, the interaction of groups and playing positions demonstrated the

existence of statistically significant difference on standing height.

Since, the interaction effect is found to be significant, the simple effect test has been applied, and it was given in Table 2.

Table – 2: Simple Effect Test on Standing Height

	Sum of Squares	df	Mean Square	F	Sig.
Between Forwards of different Groups	.200	1	.200	.008	.928
Between Midfielders of different Groups	221.565	1	221.565	9.029	.003
Between Defenders of different Groups	28.391	1	28.391	1.157	.284
Between Goalkeepers of different Groups	81.000	1	81.000	3.301	.071
Among Playing Positions of Successful Teams	66.323	3	22.108	.901	.442
Among Playing Positions of Less Successful Teams	502.570	3	167.523	6.827	.000
	3852.656	157	24.539		

The pairwise comparison for the mean differences on standing height of different playing positions between successful and less successful football team players was given in Table 3.

Table – 3: Paired Mean Differences on Standing Height

Playing Positions	(I) Group	(J) Group	Mean Difference (I-J)	Sig.
Forwards	Successful	Less Successful	0.133	.928
Midfielders	Successful	Less Successful	5.109*	.003
Defenders	Successful	Less Successful	1.442	.284
Goalkeepers	Successful	Less Successful	4.500	.071

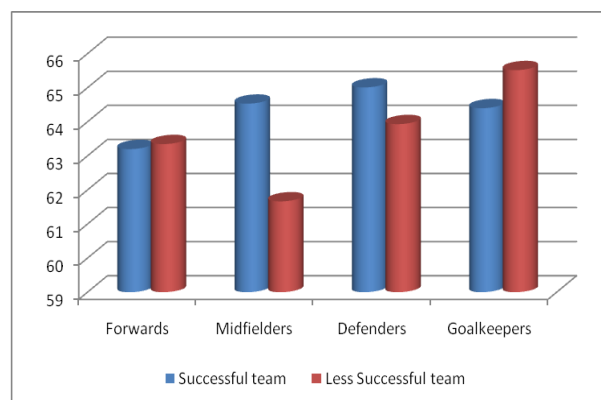
The pair wise comparison for the mean differences on standing height of different groups (*successful and less successful*) among playing positions of football team players was given in Table-4.

Table – 4: Paired Mean Differences on Standing Height

Groups	(I) Playing Positions	(J) Playing Positions	Mean Difference (I-J)	Sig.
Successful Football Team Players	Forwards	Midfielders	-2.333	.208
		Defenders	-2.136	.177
		Goalkeepers	-.167	.943
	Midfielders	Forwards	2.333	.208
		Defenders	.197	.912
		Goalkeepers	2.167	.383
	Defenders	Forwards	2.136	.177
		Midfielders	-.197	.912
		Goalkeepers	1.970	.389
	Goalkeepers	Forwards	.167	.943
		Midfielders	-2.167	.383
		Defenders	-1.970	.389
Less Successful Football Team Players	Forwards	Midfielders	2.643*	.042
		Defenders	-.828	.500
		Goalkeepers	-4.800*	.005
	Midfielders	Forwards	-2.643*	.042
		Defenders	-3.470*	.006
		Goalkeepers	-7.443*	.000
	Defenders	Forwards	.828	.500
		Midfielders	3.470*	.006
		Goalkeepers	-3.972*	.017
	Goalkeepers	Forwards	4.800*	.005
		Midfielders	7.443*	.000
		Defenders	3.972*	.017

The mean values on weight among different playing positions of successful and less successful football team players are graphically illustrated in figure-1.

Figure 1: Graphical Representation of the Mean Values on Weight among Different Playing Positions of Successful and Less Successful Football Team Players



The data on weight have been analyzed by two-way factorial ANOVA (2x4) and the obtained results are presented in Table-5.

Table – 5: Two Way Factorial ANOVA on Weight

Source	Sum of Squares	df	Mean Square	F	Sig.
Groups	13.556	1	13.556	.445	.506
Positions	74.824	3	24.941	.818	.486
Groups *Positions	61.867	3	20.622	.676	.568
Error	4787.502	157	30.494		

It is observed from Table-5 that no significant differences exist between groups (*successful and less successful*) irrespective of playing positions on standing height. Per se, no significant differences exist between playing positions (*forwards, midfielders, defenders, & goalkeepers*) irrespective of groups on standing height. Furthermore, the interaction of groups and playing positions also demonstrated the non-existence of statistically significant difference on weight.

CONCLUSIONS

It was concluded that though the variation in stature exists among different playing positions of successful and less successful football team players, it is not so with the case of body mass.

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Corresponding Author

Kiran Kumar H. K.*

Director of Physical Education, M. S. Ramaiah Institute of Technology, Bangalore

E-Mail – kirandpe@msrit.edu