

COMPARISON OF ANTHROPOMETRICS CHARACTERISTICS AND BODY COMPOSITION OF ELITE INDIAN SOCCER PLAYERS BASED ON TEAM POSITIONS

Mr. Mohd Salim Javed, Assistant Professor,
LPU University, Phagwara-Punjab



ABSTRACT

The purpose of the study was to determine differences in, anthropometrical characteristics and body composition of Elite Indian male soccer players based on team positions namely Goalkeeper, fullback, halfback and forwards were compared. To find out differences in, anthropometrics characteristics and body composition 70 elite soccer players were selected from Santosh trophy, All India intervarsity football championship and also from various top levels Indian football clubs. F-test result revealed significant difference in anthropometrics characteristics and body composition of soccer players based on team positions. Further Sheffe's test revealed insignificant difference. In anthropometrics characteristics and body composition of four field positions.

Keywords: Anthropometrics Characteristics and Body Composition

INTRODUCTION

Football is probably the world's most popular sport, played in practically every nation at varying levels of competence. Football may be played competitively or for fun, as a career, a means of keeping fit or simply a recreational pursuit (Reilly, 1996). Most sports, including football, require certain physical characteristics and body composition, and whilst there is an increased interest in football judging by the popularity of events such as the World Cup, few standards for male teams world-wide exist. As in the study undertaken by Bell & Rhodes (1980), the defenders tended to be taller, heavier and have less body fat than either the midfielders or the strikers, hence they were more robust.

The game of football contains physical challenges. Though two players may be equal in their skills but because of different physical and mental response, there can be much difference in their performance. A player must be quick in assessing a situation and in his response. A forward has to decide between pass and shot, defender between marking and covering and a goalkeeper whether to defend, keep standing at the goal or to run forward or sideways. A player may specialize to play in a particular position. It is better if he develops skills necessary for other positions. All players should be aware of both the attacking and defensive principles of game and a player must learn from his own observations and mistakes. Football is a game of constant action and requires continuous adaptation to the changing situations, by the team as a whole as well as by each individual player. Though it is a team game, but there is still ample room for players to display their brilliance through individual skills during the game. At international level football matches tend to attract millions of people to watch them. The game is fast, beautiful, unpredictable and exciting. Among the many reasons that makes the game attractive is scoring of goals during 90 minutes, golden time, penalty shootout, and sudden death.

To win a football match, a team must score more than the opponent team. This is accomplished by coordination of 11 players in to one collective effort through the development of tactical attacks and defense based on accepted principles of the game. This research study had attempted to highlight the anthropometrical and body composition differences of elite Indian football players playing on different field positions.

This research study will provide appropriate guidelines of physical characteristics regarding anthropometrics and body compositions to coaches for identification of potential football players at early stage and their promotion in different position as per their body structure.

METHODOLOGY

Collection of Data

For the purpose of this study Data of 21 elite male Indian Football players from Santosh Trophy held at Calicut (Kerala) football players of different positions were collected from 21st Nov to 20th Dec 2006. Data of 49 elite football players of different positions was collected from 15 Oct to 1st Nov 2004. From All India Inter-varsity, held at Jodhpur (Rajasthan).

Variables Selected

Anthropometry

Anthropometric measurements were carried out according to the technique of Norgan & Jones (1990). Body weight was measured with SECA digital balance to the nearest 0.1 kg. The balance was calibrated for accuracy with the use of a known weight. Height measurements were read to the nearest 0.5 cm from a scale marked in centimeters up to a height.

Body Fat %

Skinfold thickness measurements were taken with Harpenden skinfold calipers (British Indicators, UK) to the nearest 0.1mm. Total body fat was estimated from the sum of four skinfold values taken at the biceps, triceps, subscapular and suprilliac as recommended by Durnin & Rahaman (1967) and calculated using the Durnin & Womersley equations (1974).

Body Composition: Assessment of Body Mass Index (BMI): $BMI = [Weight \text{ in Kg.} \div (Height \text{ in m.})^2]$ Measurement of % Body Fat as per Siri Equation (1956)

Statistical Technique

Data was analyzed by using Analysis of variance (ANOVA). On observing significant difference, we had used Scheffe's test for analyzing further mean difference among the Indian soccer players based on different field playing positions.

RESULTS AND DISCUSSIONS OF FINDINGS

Results obtained through analysis of variance and Scheffe's test for weight are produced below.

Table: 1
Comparison of Weight of Elite Goalkeeper, Full Back, Half Back and Forwards

Source of variation	DF	SS	MSS	F – value
Treatment	3	177.29	59.10	2.02
Error	66	1936.19	29.34	

*Significant at .05 level

Tab.F.05 (3, 66) =2.75

Since calculated F value 2.02 is lower than tabulated F value 2.75 we are able to conclude that significant difference does not exist in the mean weight of four groups.

Table: 2
Comparison of Height of Elite Goalkeeper, Full Back, Half Back and Forwards

Source of variation	DF	SS	MSS	F – value
Treatment	3	730.08	243.36	9.34*
Error	66	1719.77	26.06	

*Significant at .05 level

Tab.F.05 (3, 66) =2.75

Since calculated F value 9.34 is greater than tabulated F value 2.75, we are able to conclude that significant difference exists in the mean stature of four groups. Further to find out which group is greater than the other we had applied scheffe's test, the analysis pertaining to this is given in table.

Table: 3
Comparisons of Mean value of Height of different groups

EGK	EFB	EHB	EFW	Mean difference	CD at 5% Level
177.89	174.17			3.72	5.76
177.89		168.24		9.65*	5.84
177.89			171.12	6.77*	6.04
	174.17	168.24		5.93*	4.42
	174.17		171.12	3.05	4.69
		168.24	171.12	2.88	4.78

*Significant at 5% level Tab.F.05 (3, 66) =2.75

Comparing the pair wise mean difference with the critical difference, it is evident that the mean height of elite goalkeeper is significantly greater than the mean stature of elite half back, forward and also the mean stature of elite full back is significantly greater than the elite half back. Where as there is no significant difference in the mean height of elite goalkeeper and full back and also no significant difference exists in full back, forward and in half back and forwards.

Table: 4
Comparison of Percentage of Body Fat Height of Elite Goalkeeper, Full Back, Half Back and Forwards

Source of variation	DF	SS	MSS	F – value
Treatment	3	3.04	1.01	1.85
Error	66	36.07	.55	

*Significant at.05 level Tab.F.05 (3, 66) =2.75

Since calculated F value 1.85 is lower than tabulated F value 2.75, we are able to conclude that significant difference does not exist in the mean % of body fat of four groups.

Table: 5
Comparison of BMI of Elite Goalkeeper, Full Back, Half Back and Forwards

Source of variation	DF	SS	MSS	F – value
Treatment	3	12.16	4.08	1.98
Error	66	144.28	2.20	

*Significant at.05 level Tab.F.05 (3, 66) =2.75

Since calculated F value 1.98 is lower than tabulated F value 2.75, we are able to conclude that significant difference does not exist in the mean BMI of four groups.

CONCLUSIONS

Weight: It is observed that no significant difference exists among the mean weight of four field position of elite soccer players.

Height: It is also observed that the mean height of elite goalkeeper is significantly greater than the mean height of elite half back, elite half back is greater than forwards and also full back is greater than half back. Whereas there is no significant difference in the mean height of elite goalkeeper and full back and also no significant difference exists in elite full back, half back and forwards.

Sum of five skin fold: It is observed that no significant difference exists among the mean % of body fat of four groups of elite soccer players.

Body Mass Index (BMI): It is observed that no significant difference exists among the mean BMI of four groups of elite soccer players. All though statistically we are seeing only difference in the mean height but there is no differences in mean weight,% of body fat and BMI of four field positions of Indian soccer players. Although Nudri, Ismail & Zawiah (1996) had presented data on Malaysian athletes, there is a scarcity of data on the body composition and anthropometric measurements of Malaysian footballers.

As in the study undertaken by Bell & Rhodes (1980), the defenders tended to be taller, heavier and have less body fat than either the midfielders or the strikers, hence they were more healthy.

The anthropometric characteristics of the players can be an indicator of physical readiness of the sportsman and therefore the anthropometric and body composition examination is an important segment of the physical (sport) examination of the sportsman. The group of the soccer players showed significant differences in height, show similar values of fat and BMI component in relation to the peers in the general population. The obtained results can serve as normative anthropometric and body composition indicators for regular sports medical examinations of young players in our country. The information can also be used as a template for comparison of anthropometric characteristics and body composition information of young players at a similar level from our country which will be more beneficial to promote soccer in India at different level.

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