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Comparison of anthropometric measurements between goalkeepers of soccer and hockey of Himachal Pradesh University

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Abstract
The purpose of the study was to analyze the differences in linear measurements between goal keepers of football and hockey game. This study was conducting on 20 goal keepers of football and hockey game with an aim to find out differences in certain linear anthropometric measurements between the goal keepers of football (N = 10) and hockey (N = 10). The data for the present study were collected in the inter college competition organized by Himachal Pradesh University. Each player was tested for various anthropometric measurements necessary for estimation of body weight, height, sitting height and certain linear measurements of goal keepers of football and hockey game. To analyze the difference in selected anthropometric measurements between two groups of football and hockey game were determined through 't' test. From the findings, it may be interpreted that goal keepers of football game have depicted somewhat higher mean value for height, weight, sitting height, total arm length, leg length, upper leg length, foot length and foot width and similarly, the goal keepers of hockey game have shown higher mean value for lower leg length as compared to goal keepers of football game. But none of such mean differences were found to be significant at 0.05 levels.

Keywords: Anthropometry, linear measurements, anthropometry, football and hockey

Introduction
The term anthropometry was invented by JS Elsholtz, a German Physician, in Seventeenth Century refers to measurement of human body and its various proportions. It encompasses a wide variety of measurement procedures for determining endless number of body dimensions. Each user incorporates a different set of anthropometric measurements to explain the problem under investigation. Besides a few common measurements, like stature and body weight, the set of measurements selected by one user rarely coincides with that of the other, in general. But under specific circumstances, where the goal to be achieved is more or less similar the measurements selected by two users may exhibit considerable similarity. The variations documental in the procedure of measurement from a wide variety of sources have little practical significance in most case. But to a design engineer it is essential to be aware of the different sources and the variations that exist in the anthropometric data.

Assessment of the human body is important to determine its relationship with risk of health problems such as overweight, growth failure, and eating disorders. The sports structure in India is fast changing because of the availability of increased facilities and sports environment. Awareness among the coaches and physical educationists towards the recent advances in sports sciences is growing rapidly. The role of an emerging scientific discipline known as sports anthropometry is of great significance.

The investigator in the underline study would like to compare the anthropometric variables i.e. height, weight and certain linear measurements between goal keepers of football and hockey.

Methodology
To achieve the purpose of this study 20 football and hockey goal keepers football (N = 10), hockey (N = 10), who participated in the inter college completion organized by Himachal Pradesh University were randomly selected and used as subjects in this study.

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Age group ranged from 18-25 years. Each athlete was tested for various anthropometric measurements necessary for estimation of body weight, height, sitting height and some selected linear measurements. A set of anthropometric measurements i.e. weighing scale, anthropometric rod and measuring tape were used for the measurements. To test the significance of mean difference between the football and hockey players, statistical technique of 't' test was applied.

Results and Discussion
Since the purpose of the study was to analyze the height, body weight and selected linear measurements of goal keepers of football and hockey game, these are explained with the help of different tables.

Table 1: Comparison of Height, Body Weight and Sitting Height between goal keepers of football and hockey

Variables	Footballers (N = 10)			Hockey players (N = 10)			T Ratio
	Mean	SD	SEM	Mean	SD	SEM	
Height (cm)	172.2	3.26	1.03	170.1	3.14	0.99	0.34
Body Weight (kg)	63.95	4.87	1.54	62.3	5.26	1.67	0.26
Sitting Height (cm)	73.82	4.03	1.27	72.88	6.24	1.97	0.15

Not significant at 0.05 level

Table 1 depicts the means, standard deviations and values of SEM for height, weight and sitting height of goal keepers of football and hockey games. Further, it has been found that goal keepers of football game have depicted somewhat higher mean value for height, weight and sitting height. But none of such mean differences were found to be significant. Hence, the Hypothesis that, "there would be no significant difference between goal keepers of football and hockey in relation to height, body weight and sitting height" is accepted.
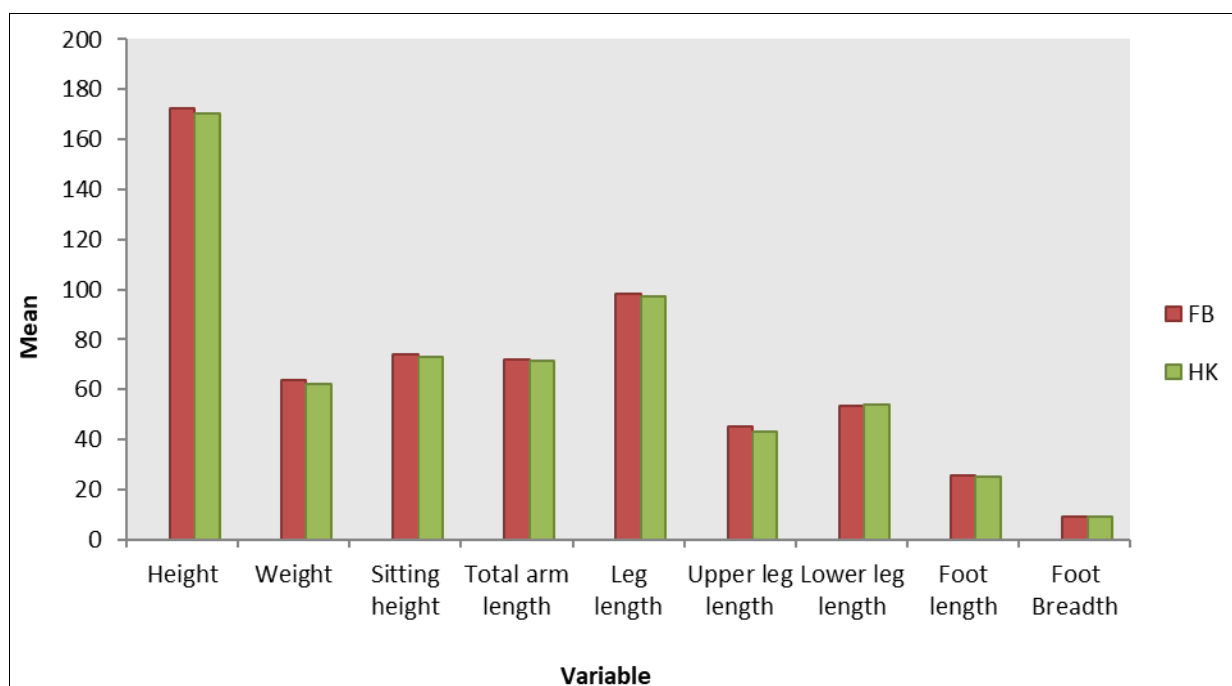
Table 2: Comparison of linear measurements between goal keepers of football and hockey game

Variables	Footballers (N = 10)			Hockey players (N = 10)			T Ratio
	Mean	SD	SEM	Mean	SD	SEM	
Total Arm Length (cm)	72.19	1.91	.60	71.46	3.70	1.17	0.12
Leg length (cm)	98.38	3.26	1.03	97.22	6.04	1.91	0.19
Upper leg Length (cm)	44.97	3.86	1.22	43.14	4.99	1.58	0.30
Lower Leg Length (cm)	53.41	2.62	0.83	54.08	3.01	.95	0.11
Foot Length (cm)	25.68	1.58	0.50	25.2	2.03	0.64	0.08
Foot Breadth (cm)	9.12	.45	0.14	9.07	0.71	0.23	0.01

Not significant at 0.05 level

Table 2 depict the means, standard deviations and values of SEM for total arm length, leg length, upper leg length, lower leg length, foot length and foot width of goal keepers of football and hockey games. Further, it has been found that goal keepers of football game have depicted somewhat higher mean value for total arm length, leg length, upper leg length, foot length, foot width and similarly, the goal keepers of hockey game have shown higher mean value for lower leg length as compared to goal keepers of football game. But none of such mean differences were found to be significant. Hence, the Hypothesis that, "there would be no significant difference between goal keepers of football and hockey in relation to selected linear measurements namely; total arm length, leg length, upper leg length, lower leg length, foot length and foot width" is accepted.

Fig 1: Comparison of Height, Weight, Siting Height and linear measurements between goal keepers of football and hockey game

Discussion

Goal keepers of football game were taller, heavier and possess greater value for sitting height, total arm length, leg length, upper leg length, foot length and foot breadth and possess lesser value for lower leg length than goal keepers of hockey game. There was no significant difference established between the goal keepers of football and hockey game in height, weight, sitting height, total arm length, leg length, upper leg length, lower leg length, foot length and foot breadth. This indicates that goal keepers of football game were near about same in height, weight, sitting height, total arm length, leg length, upper leg length, lower leg length, foot length and foot breadth of goal keepers of hockey game.

Conclusions

Goal keepers of football game were taller and heavier than goal keepers of hockey game. However they do not differ significantly in height, body weight and sitting height.

- Goal keepers of football game were possess greater value for total arm length, leg length, upper leg length, foot length and foot breadth and possess lesser value for lower leg length than goal keepers of hockey game. However they do not differ significantly in all linear measurements when compared with each other.

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