



Anthropometric Characteristics Somatotyping on Body Composition of Hand Ball & Basketball Player

KEYWORDS

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Introduction

To evaluate these physical abilities, the anthropometric measurements, parameters of the body composition such as the percent body fat (% FAT); fat-free mass (FFM) and Somatotype components are often used. Studies on the physical characteristics of the human body to-date indicate that the morphological characteristics of athletes successful in a specific sport differ in somatic characteristics from the general population. Basketball and volleyball players are typically taller than the players of other games. Basketball and volleyball require handling the ball above the head; therefore, having a greater height is an advantage in these sports. Higher body mass however, is a hurdle for Handball players in achieving good jumping height. Various researchers suggested that different body size, shape and proportions are beneficial in different physical activities.

Objectives of the study

1. To study the anthropometric characteristics and body composition of basketball and handball players.
2. To study the body types of the basketball and handball players.

Material and methods

The present study was conducted on 63 young male subjects (Handball =36 and Basketball = 27) of age group 18-25 years. The subjects were randomly selected from the different colleges affiliated to Gujarat University, Ahmadabad, and Gujarat, India irrespective of their caste, religion, dietary habits and socioeconomic status. The age of each subject was calculated from the date of birth as recorded in his institute.

Statistical analyses

Values are presented as mean values and SD. Independent samples t tests were used to test if population means estimated by two independent samples differed significantly. Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SSPs, In.).

Table 1

Physical parameters of the handballers and basketballers

Variables	Basketballers (N=27) Mean SD		Handballers (N=36) Mean SD		t- Value
Height (cm)	187.44	5.19	183.25	6.15	2.85**
Weight (kg)	79.40	7.70	73.02	7.58	3.28**
BMI	22.63	2.33	21.78	2.35	1.41
BSA	2.04	0.09	1.94	0.94	3.95**

** indicates $p < 0.01$.

Table 2

Different skin folds measurements of the Handballers and Basketballers.

Variables	Basketballers (N=27) Mean SD		Handballers (N=36) Mean SD		t- Value
Biceps (mm)	4.88	1.25	4.00	1.17	2.89**
Triceps (mm)	7.48	1.31	8.69	3.43	1.37
Subscapular (mm)	12.55	3.04	11.38	3.66	1.34

Suprailliac (mm)	14.77	2.96	9.03	5.45	4.49
Calf (mm)	13.07	3.57	11.19	3.97	1.94

** indicates $p < 0.01$.

Table 3

Diameters and circumferences of the volleyballers and basketballers

Variables	Basketballers (N=27) Mean SD		Handballers (N=36) Mean SD		t- Value
Bi-hummers diameter	69.77	3.45	70.45	6.49	0.49
Bi-femur diameter	102.66	5.89	100.03	6.99	1.58
Upper arm circumference	27.00	1.33	26.33	1.88	1.56
Calf circumference	36.66	2.28	35.50	2.10	2.56

* indicates $p < 0.05$.

Table 4

Different components of body composition of the volleyballers and basketballers

Variables	Basketballers (N=27) Mean SD		Handballers (N=36) Mean SD		t- Value
Body density	1.062	0.004	1.068	0.009	3.13**
% BF (kg)	15.95	2.12	13.30	4.01	3.10**
TF (kg)	12.67	2.11	9.88	3.75	3.46**
FFM (kg)	66.72	6.59	63.13	5.39	2.37*

* indicates $p < 0.05$. ** indicates $p < 0.01$.

Results:

Table 1 shows the descriptive statistics for physical parameters of Handball and basketball players. Mean body height of basketball players was significantly higher than those of volleyball players ($p < 0.01$). Basketball players also had significantly greater weight ($p < 0.01$) as compared to Handball players. No statistically significant difference was observed between the basketball players and the Handball players in relation to BMI. BSA was significantly higher in basketball players than those of Handball players ($p < 0.01$). In Table 2 descriptive statistics for skin fold measurement values are depicted. Both biceps ($p < 0.01$) and suprailliac skin folds ($p < 0.01$) measurements were observed to be significantly higher for basketball players than handball players.

The differences observed between the two groups for triceps, sub scapular and calfskin fold measurement were not statistically significant. Descriptive statistics of diameters and circumferences are shown in Table 3. There was no significant difference between basketball players and volleyball players in bi-humerus and bi-femur diameters. Since arm and calf circumference measurements reflect the bone, muscle and fat mass of the limbs, these two variables have also been evaluating. No significant difference was observed in upper arm circumference between the two groups, but calf circumference ($p < 0.05$) was significantly higher for Basketball players when compared to Handball players.

Descriptive statistics for different components of body composition are presented in Table 4 Handball Players were found to have significantly greater body density ($p < 0.01$) when compared to basketball players. The basketball players were observed to have significantly higher percent body fat ($p < 0.01$) and total body fat ($p < 0.01$) when compared to Handball players. Fat free mass (FFM) was also significantly greater in basketball players ($p < 0.01$) than those of Handball players. Table 5 summarizes the descriptive statistics of the somatotyping components. Endomorphic values of basketball players were significantly higher ($p < 0.01$) than those of Handball players. In relation to mesomorphy and ectomorphy, no significant differences were observed between the two groups.

Table 5
Somatotyping of the Handballers and basketballers

Variables	Basketballers (N=27)		Handballers (N=36)		t- Value
	Mean	SD	Mean	SD	
Endomorph	3.21	0.56	2.68	1.05	2.37
Mesomorphy	2.91	1.14	3.06	1.11	0.51
Ectomorphy	3.40	1.30	3.57	1.41	0.50

* indicates $p < 0.05$.

Discuss:

In the present study the anthropometric characteristics of the athletes have not been evaluated in relation to their performance, but were instead compared with each other.

This study indicates the existence of differences among the players of different games. The overall results show that basketball players were taller and heavier as

Compared to the volleyball players similar findings were found in the studies on Malaysian male athletes (Nadir et al., 1996) and Turkish male athletes (Pelin et al., 2007) which

reported that the height of basketball players was greater when compared to other sports groups. The basketball players were also reported to have greater body fat percentage, skin fold measurements, FFM and endomorphic component as compared to Handball players. These results show that basketball players were taller, heavier and fatter as compared to their counterparts. On average, the basketball players of the present study are considerably taller and heavier than the State level players studied by Sodhi (1976) and top-ranking Indian basketball players (Sodhi, 1980). On the other hand, they are considerably shorter and lighter when compared to their international counterparts (Sallet et al., 2005; Apostolicism et al., 2003). Because the basketball and volleyball require handling the ball above the head, having a greater height is an advantage in basketball and volleyball games (Kansal et al., 1986). Lower height of Indian basketball players might be the one of the reason for their dismal performances at the international level.

In Handball, teams compete by manipulating skills of spiking and blocking high above the head. Therefore, the presence of tall players is an indispensable factor in the success of a team. The volleyball players in the present study have greater height and weight than the Handball players from West Bengal studied by Bandyopadhyay (2007) whereas they are shorter and lighter than their international counterparts (Guild and Mascagni, 2001; Morques and Merino, 2009; Gobbet, 2008). The present data regarding the % fat of the players is approximately accords with the proposal that percentage fat value among basketball and volleyball players should be within the range of 6-15% (Wilmore and Costill, 1999). The basketball players in the present study have higher percentage body fat than the elite level Greek basketball players (Sallet et al., 2005) and French professional basketball players (Apostolicism et al., 2003). The volleyball players have higher body fat percentage than the Handball players from West Gujarat studied by Bandyopadhyay (2007).