



ISSN: 2456-4419

Impact Factor: (RJIF): 5.18

Yoga 2017; 2(2): 341-344

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www.theyogicjournal.com

Received: 03-05-2017

Accepted: 05-06-2017

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An assessment of anthropometric variables among male cricketers of Chandigarh

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Abstract

The main purpose of the study was to compare the anthropometrical components; height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth, among fast bowlers; spinners and batsmen of state level male cricketer of Chandigarh (India). To achieve the objective of the study, sixty (60) state level male cricketers (20 fast bowlers, 20 spinners and 20 batsmen) were taken purposively as a subject for the study. The age of the subjects ranged between 19-25 years. Height was measured in nearest centimeter, weight was measured in nearest kilogram and arm, thigh and calf length, biceps unflexed, biceps flexed, thigh and calf girth were measured in centimeters. To determine the significance difference on anthropometrical variables, analysis of variance (ANOVA) was computed with the help of SPSS software. The level of significance was set at 0.05. Statistical calculation on gathered data showed that there were no significant differences found among fast bowlers, spinners and batsmen of Chandigarh on height, weight, arm length, thigh length, biceps unflexed, biceps flexed, thigh girth and calf girth.

Keywords: cricketers, anthropometry, bowlers, spinners and batsmen

Introduction

In earlier times cricket has been widely considered as a sport that did not require a great potential of physical fitness, with many players, especially at club level, being overweight (Woolmer & Noakes, 2008) [8]. Cricket is a field-based sport, with each team consisting of 11 players. Although all are required to field and bat during a match, each player generally possesses a set of specific skills that defines their role and contributes to the overall performance of the team. The game of Cricket is developed from a simple game of hitting an object with a piece of wood. Basically it is the battle between bat and the ball, but the approach has changed from time to time (Srivastava, 2007) [7]. However, the fast evolution of the game over the last two decades has brought about a huge increase in the number of games played at the local, regional, national and international level, with increasing demand of physical fitness in the game (Cotterill, 2011) [3].

Under modern conditions especially related to training for sports and games with a focus on superior performance, adequate emphasis is given for the physical structure and body builds of each individual participant for each sports or game. Therefore, it is very evident that the body builds properly known as 'physiognomy' gets primary emphasis at the time of selection of players for concerned sports where superior competition is involved. Different kinds of physique, body size and body composition are suitable for different sports disciplines. There are body size differences among athletes in different sports, among events within the same sport and among high and low level performers in the same sport. Lutheran and Shaw write that "there are numerous factors which are responsible for the performance of a sportsperson. The physique and body composition, including the size, shape and form are known to play a significant role in this regard (Knuttgen, 1961) [4]. Anthropometric parameter are quantitative technique of determining human size, shape, proportion, composition by measuring, recording, and analyzing specific dimension of the body. Anthropometry has a rich custom in sports sciences and sports medicine. Though, in diverse times, different terms were used like dynamic

anthropometry, sports anthropometry, biometry, physiological anthropometry, anthropometrical, kin anthropometry etc. by scientists to create some relationships between the body structure and the specialized functions required for various tasks.

Duller (1962) studied anthropometric strength and performance attitudes among good and poor vaulters. He found that the measures and indices which were significantly larger at the 0.05 level for good vaulters were tibial height, chest girth, shoulder girth, shoulder width, right grip strength, leg power and speed, ilio spinal height, thigh length and shoulder width plus shoulder girth and sitting height.

Objectives of the study

To draw out the anthropometrical components; height, weight, arm length, thigh length, calf length, bicep unflexed, bicep flexed, thigh girth and calf girth, among state level male fast bowlers, spinners and batsmen.

Materials and Methods

The study was descriptive study focusing on anthropometric variables among cricketers of Chandigarh; a sample of state level male cricketers was taken purposively as a subject for the study. The subjects of the study were sixty state level male cricketers (20 batsmen, 20 spinners and 20 fast bowlers) of Chandigarh. The age of the subjects were ranging between 19 to 25 years. In consultation with experts and considering tester's competency and even feasibility criterion in mind, especially of equipments reliability and time factor, the following anthropometrical variables were selected for the study namely: height, weight, arm length, thigh length, calf length, biceps unflexed, biceps flexed, thigh girth and calf girth. Height was measured in nearest centimeter, weight was measured in nearest kilogram and arm, thigh and calf length, biceps unflexed, biceps flexed, thigh and calf girth were measured in centimeters.



Fig 1: Illustrations of Standing Height Measurement and Weight Measurement.



Fig 2: Illustration of Calf Length Measurement and Thigh Length Measurement.

The significant difference between batsman, spinners and fast bowlers on anthropometric variables i.e., height, weight, arm length, thigh length, calf length, biceps girth (flexed and unflexed), thigh girth, and calf girth were calculated by using one way ANOVA with the help of SPSS software and the level of significance was set at 0.5.

Results and Findings

Descriptive analysis of anthropometric variables (height, weight, arm length, thigh length, and calf length) among fast bowlers, spinners and batsmen of Chandigarh are presented in table-1.

Table 1: Descriptive analysis of fast bowlers, spinners and batsmen on anthropometric variables.

Variable	Group	N	Mean	SD
Height	Fast bowler	20	176.05	5.47218
	Spinner	20	168.05	24.46152
	Batsmen	20	174.30	7.18258
Weight	Fast bowler	20	71.5500	7.89053
	Spinner	20	70.8500	11.54978
	Batsmen	20	71.6500	7.20581
Arm Length	Fast bowler	20	68.4000	2.56289
	Spinner	20	66.9000	3.17722
	Batsmen	20	66.7250	4.64383
Thigh Length	Fast bowler	20	42.6000	2.16187
	Spinner	20	41.6000	2.74149
	Batsmen	20	41.7750	2.20332
Calf Length	Fast bowler	20	49.4000	2.52149
	Spinner	20	48.1500	2.70039
	Batsmen	20	48.6000	3.11870
Biceps Unflexed	Fast bowler	20	30.2000	2.37531
	Spinner	20	29.9500	2.54383
	Batsmen	20	30.9000	2.02355
Biceps Flexed	Fast bowler	20	32.2000	2.33057
	Spinner	20	31.8000	2.50473
	Batsmen	20	32.9000	2.17401
Thigh Girth	Fast bowler	20	47.2000	2.83957
	Spinner	20	47.2500	4.07657
	Batsmen	20	47.9000	2.77014
Calf Girth	Fast bowler	20	32.9000	2.59351
	Spinner	20	33.2500	3.05864
	Batsmen	20	33.5750	2.09809

The Analysis of Variance (ANOVA) among state level male fast bowlers, spinners and batsmen of Chandigarh is presented in table-2.

Table 2: ANOVA of fast bowlers, spinners, and batsmen on anthropometric variables.

Variable	Sources of Variance	Sum of Squares	Df	Mean Square	F
Height	Between Group	707.500	2	353.750	1.56
	Within Group	12918.100	57	226.633	
	Total	13625.600	59		
Weight	Between Group	7.600	2	3.800	.04
	Within Group	4704.050	57	82.527	
	Total	4711.650	59		
Arm Length	Between Group	33.908	2	16.954	1.33
	Within Group	726.338	57	12.743	
	Total	760.246	59		
Thigh Length	Between Group	11.408	2	5.704	1.00
	Within Group	323.838	57	5.681	
	Total	335.246	59		
Calf Length	Between Group	16.033	2	8.017	1.02
	Within Group	444.150	57	7.792	
	Total	460.183	59		
Biceps Unflexed	Between Group	9.700	2	4.850	.89
	Within Group	307.950	57	5.403	
	Total	317.650	59		
Biceps Flexed	Between Group	12.400	2	6.200	1.13
	Within Group	312.200	57	5.477	
	Total	324.600	59		
Thigh Girth	Between Group	6.100	2	3.050	.28
	Within Group	614.750	57	10.785	
	Total	620.850	59		
Calf Girth	Between Group	4.558	2	2.279	.33
	Within Group	389.188	57	6.828	
	Total	393.746	59		

*Significant at .05 level, $F_{.05}(2, 57) = 3.15$

The results of above table indicates that there were no significant differences found among fast bowlers, spinners and batsmen of Chandigarh on height, weight, arm length, thigh length, biceps unflexed, biceps flexed, thigh girth and calf girth variables as the obtained F values were 1.56, .04,

1.33, 1.00, 1.02, .89, 1.13, .28 and .33 was found to be less than the table value of 3.15, which was required to be significant at .05 level.

Mean scores of different three groups on anthropometrical variables (height, weight, arm length, thigh length, calf

length, biceps unflexed, biceps flexed, thigh girth and calf girth) are depicted graphically in figure-3.

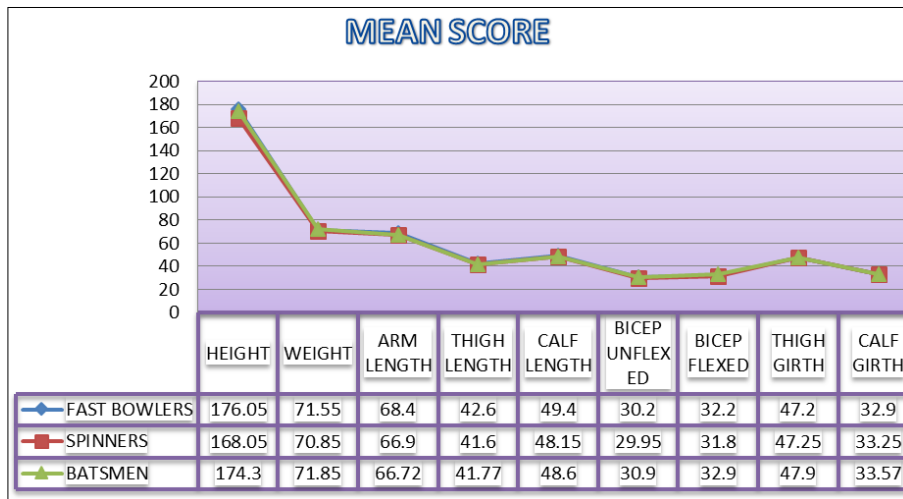


Fig 3: Graphical Representation of Mean Scores of State Level Male Fast Bowlers, Spinners and Batsmen of Chandigarh on Anthropometrical Variables.

Discussion of finding

The findings of the study indicate that there were no significant differences found on anthropometric variables (height, weight, arm length and thigh length, calf length, biceps unflexed, biceps flexed, thigh girth and calf girth) as the obtained F values were found to be less than the table value which was required to be significant at .05 level. Probable reason could be that the subjects of this study were living under same geographical, cultural and environmental conditions. Koul (2009) conducted a study on “anthropometric physiological and physical profiles of the cricketers” with purpose of preparing anthropometric physiological and physical profiles of cricketers. The study concluded that subjects were differ in anthropometric, physiological and physical characteristics, fast bowlers were found greater in body fat, leg length, chest girth, calf girth, lean body weight, blood pressure, hemoglobin content, vital capacity and anaerobic capacity than spinners and batsmen. But batsmen were found having lower resting pulse rate than fast bowlers and spinners. With respect of strength, speed and endurance fast bowlers were found significantly better than batsmen and spinners. Kumar (2007) compared the selected physical and anthropometric variables of javelin throwers and fast bowlers and that there was significant difference in the arm strength, back strength and weight between fast bowlers and javelin throwers. Koley *et al.* (2010) conducted a cross-sectional study as of two-fold: firstly, to evaluated the back strength of Indian inter-university male cricketers and secondly, to study its relation to leg strength, along with selected anthropometric characteristics. They found statistically significant differences (0.05) in weight, BMI, thigh length, total leg length, biceps, triceps, sub-scapular and calf skinfolds, percentage of body fat and back strength between the cricketers and control participants.

Conclusion

Statistical calculation on gathered data showed that there were no significant differences found among fast bowlers, spinners and batsmen of Chandigarh on height, weight, arm length, thigh length, biceps unflexed, biceps flexed, thigh girth and calf girth.

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