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## **An Anthropometric Assessment Of Selected Variables Among Male Cricketers Of Himachal Pradesh: A Comparative Study**

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### **Abstract**

**Purpose:** The study was conducted with the purpose to analyze and compare the anthropometrical components; height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth, among fast bowlers, wicket keepers and batters of district and state level male of cricketer of Himachal Pradesh (India)

**Subject:** Purposive sampling technique has been used for the selection of the subjects, sixty (60) state and district level male cricketers (fast bowlers, batters and wicket keepers) of Himachal Pradesh (India) were selected purposively and their age was ranged between 16 to 19 years.

**Methods:** Anthropometry rod or Stadiometer was used to measure height in centimeters to the nearest centimeters. The weight was read on the balance to the nearest of 0.5 kg with the help of weighing machine, Arm length, thigh length, calf length, biceps inflexed, biceps flexed, thigh and calf girth was measured in centimeters to the nearest centimeters through measuring tape.

**Statistics used:** (ANOVA) analysis of variance has been used with the help of SPSS software to test the significance difference in anthropometric variables; 0.05 has been taken as the level of significance.

**Conclusion:** The Statistical calculation of acquired data presented that no significant differences were found on anthropometrical components (height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth).

**Key words:** anthropometric, cricketers, measuring tape, software, stadiometer

### **Introduction**

Cricket is a game in which each team has to bowl and bat according to certain rules and regulations. A team which scores greater number of runs will be the winner (Raman, 1983)

In olden days, the game was played in different names in different countries. 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. Cricket is played in many forms such as Test, One day International, First class Twenty 20, and Super Six, Eight-a-side, Indoor Cricket Max Cricket, Double wicket and Single wicket. Cricket is played in more than 105 countries around the globe (Srivastava, 2007). In India, cricket game is being nurtured by the Board of Control for Cricket in India (BCCI), with the help of its affiliates. Under modern conditions especially related to training for sports and games with a focus on superior performance, adequate emphasis is given for the anthropometric 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. Hence, the trend in the field of games, sports and anthropometric education is to assess the related components scientifically as a part of the total body build and size of each player and also to interpret how far these components are helpful in the performance in games and sports under competitive conditions. Debnath and Bawawrite that sports performances in various games and sports are influenced by many factors such as anthropometric, physiological, technical abilities, physique, body size, body composition etc. Physique and body composition are the basic performance determining factors and play an important role in obtaining best performance. 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).

### **Objective of the study**

The study was conducted with the objective to determine the anthropometric variables - height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth, among the state and district level male fast bowlers, batters and wicket keepers of Himachal Pradesh.

### **Methodology**

Descriptive methodology was used to conduct the study, focusing on anthropometric variables among the cricketers of Himachal Pradesh. A sample of sixty state and district level cricketers (20 fast bowlers, 20 batters and 20 wicket keepers) of age group 16-19 was taken selectively as a subject for the study. Experts consultation and tester's competency has been considered and even feasibility criteria, especially of equipments reliability and time factor

also been considered, selected anthropometric variables were: ; height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth, Stadiometer was used to measure height in in centimeters to the nearest centimeters. The weight was read on the balance to the nearest of 0.5 kg with the help of weighing machine, Arm length, thigh length, calf length, biceps inflexed, biceps flexed, thigh and calf girth was measured in centimeters to the nearest centimeters through measuring tape.

### Statistics used

To find out the significance difference between fast bowlers, batters and wicket keepers on anthropometric variables i.e. height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth were calculated through one way ANOVA with the help of SPSS software and 0.05 was set as the level of significance.

### Results and findings

Descriptive analysis of anthropometric variables (height, weight, arm length, thigh length, calf length, bicep inflexed, bicep flexed, thigh girth and calf girth) among fast bowlers, wicket keepers and batters of age groups 16-19 years cricketers has been presented in table no 1

**TABLE-1 DESCRIPTIVE ANALYSIS OF FAST BOWLERS, WICKET KEEPERS, AND BATTERS ON ANTHROPOMETRIC VARIABLES**

Variable	Group	N	Mean	Std. Deviation	Std. Error
<b>HEIGHT</b>	Fast bowler	20	176.05	5.47218	1.22362
	Wicket keepers	20	168.05	24.46152	5.46976
	Batters	20	174.30	7.18258	1.60607
<b>WEIGHT</b>	Fast bowler	20	71.5500	7.89053	1.76438
	Wicket keepers	20	70.8500	11.54978	2.58261
	Batters	20	71.6500	7.20581	1.61127
<b>ARM LENGTH</b>	Fast bowler	20	68.4000	2.56289	.57308
	Wicket keepers	20	66.9000	3.17722	.71045
	Batters	20	66.7250	4.64383	1.03839
<b>THIGH LENGTH</b>	Fast bowler	20	42.6000	2.16187	.48341
	Wicket keepers	20	41.6000	2.74149	.61302

	Batters	20	41.7750	2.20332	.49268
<b>CALF LENGTH</b>	Fast bowler	20	49.4000	2.52149	.56382
	Wicket keepers	20	48.1500	2.70039	.60383
	Batters	20	48.6000	3.11870	.69736

The Analysis of Variance (ANOVA) among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh is shown in table- 2.

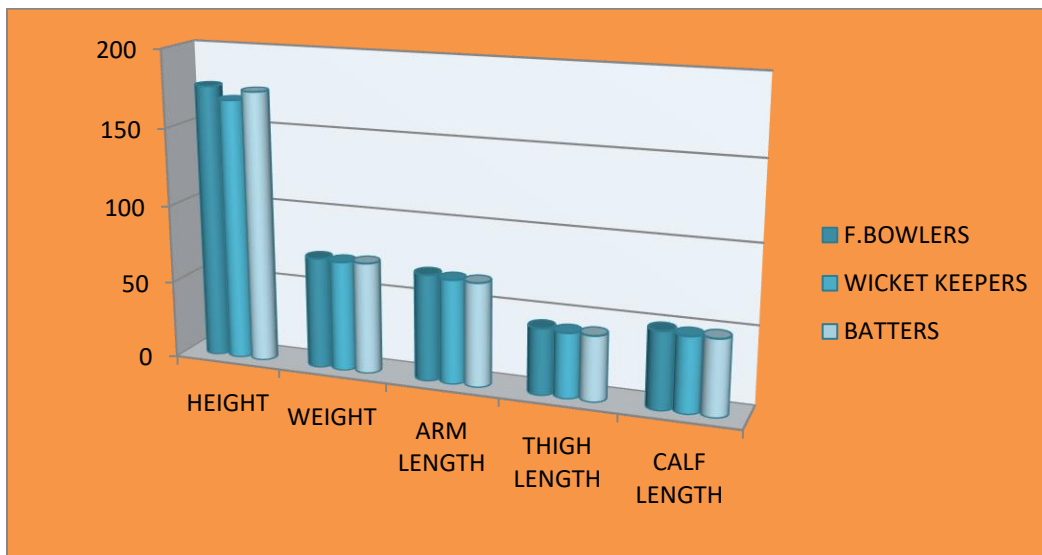
**TABLE-2 ANOVA OF FAST BOWLERS, WICKET KEEPERS, AND BATTERS ON ANTHROPOMETRIC VARIABLES**

Variable	Source of Variance	Sum of Squares	Df	Mean Square	F
<b>HEIGHT</b>	Between Group	707.500	2	353.750	1.561
	Within Group	12918.100	57	226.633	
	Total	13625.600	59		
<b>WEIGHT</b>	Between Group	7.600	2	3.800	.046
	Within Group	4704.050	57	82.527	
	Total	4711.650	59		
<b>ARM LENGTH</b>	Between Group	33.908	2	16.954	1.330
	Within Group	726.338	57	12.743	
	Total	760.246	59		
<b>THIGH LENGTH</b>	Between Group	11.408	2	5.704	1.004
	Within Group	323.838	57	5.681	
	Total	335.246	59		
<b>CALF LENGTH</b>	Between Group	16.033	2	8.017	1.029
	Within Group	444.150	57	7.792	
	Total	460.183	59		

\*Significant at .05 level

$F_{.05}(2, 44) = 3.15$

The findings of the above table indicate that there has been no significant difference found among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh on height, weight, arm length and thigh length variables as the obtained F values were 1.56, .046, 1.33, and 1.00 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 selected variables are depicted graphically in **figure-1**.



**Fig: 1. Graphical Representation of Mean Scores of 16 to 19 age groups Fast Bowlers, Wicket keepers, and Batters of Himachal Pradesh on (height, weight, arm length, thigh length, and calf length**

**TABLE-3 DESCRIPTIVE ANALYSIS OF FAST BOWLERS, WICKET KEEPERS, AND BATTERS ON ANTHROPOMETRIC VARIABLES**

	Group	N	Mean	Std. Deviation	Std. Error
<b>BICEPS UNFLEXED</b>	Fast bowler	20	30.2000	2.37531	.53114
	Wicket keepers	20	29.9500	2.54383	.56882
	Batters	20	30.9000	2.02355	.45248
<b>BICEPS FLEXED</b>	Fast bowler	20	32.2000	2.33057	.52113
	Wicket keepers	20	31.8000	2.50473	.56008
	Batters	20	32.9000	2.17401	.48612

<b>THIGH GIRTH</b>	Fast bowler	20	47.2000	2.83957	.63495
	Wicket keepers	20	47.2500	4.07657	.91155
	Batters	20	47.9000	2.77014	.61942
<b>CALF GIRTH</b>	Fast bowler	20	32.9000	2.59351	.57993
	Wicket keepers	20	33.2500	3.05864	.68393
	Batters	20	33.5750	2.09809	.46915

**TABLE-4 ANOVA OF FAST BOWLERS, WICKET KEEPERS, AND BATTERS ON ANTHROPOMETRIC VARIABLES**

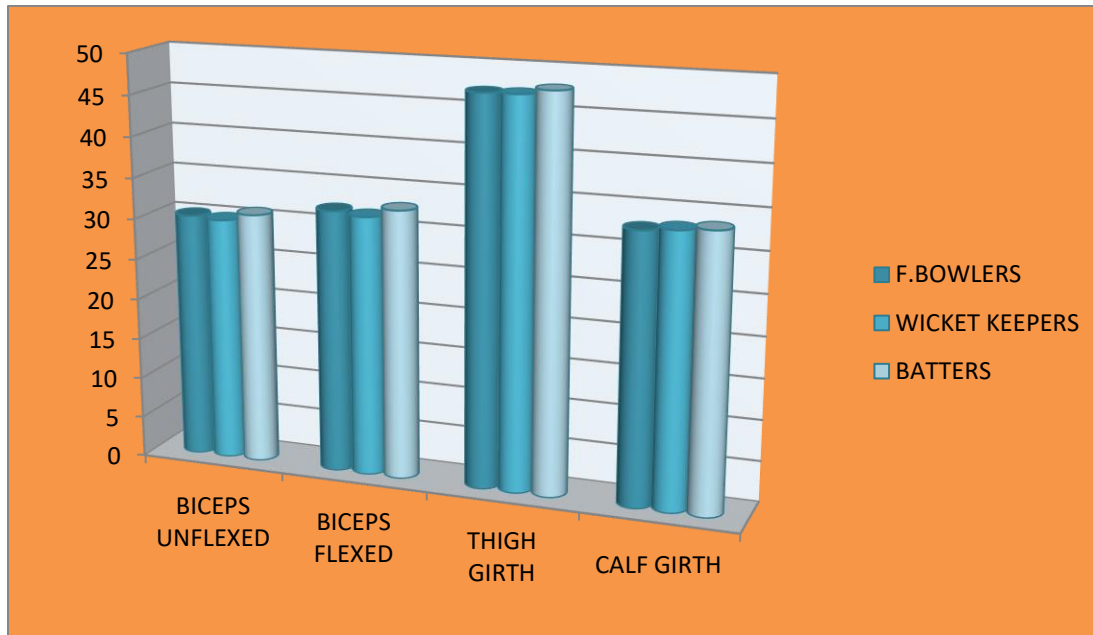
Variable	Source of Variance	Sum of Squares	df	Mean Square	F
<b>BICEPS UNFLEXED</b>	Between Group	9.700	2	4.850	.898
	Within Group	307.950	57	5.403	
	Total	317.650	59		
<b>BICEPS FLEXED</b>	Between Group	12.400	2	6.200	1.132
	Within Group	312.200	57	5.477	
	Total	324.600	59		
<b>THIGH GIRTH</b>	Between Group	6.100	2	3.050	.283
	Within Group	614.750	57	10.785	
	Total	620.850	59		
<b>CALF GIRTH</b>	Between Group	4.558	2	2.279	.334
	Within Group	389.188	57	6.828	
	Total	393.746	59		

**\*Significant at .05 level**

**F<sub>.05</sub> (2, 44) = 3.15**

As we have seen the above results it could be said that there has been no noticeable difference found among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh on biceps unflexed, biceps flexed, thigh girth, and calf girth variables as the obtained F values were .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 variables mentioned above are depicted graphically in **figure-2**.



**FIG: 2. GRAPHICAL REPRESENTATION OF MEAN SCORES OF 16 TO 19 AGE GROUPS FAST BOWLERS, WICKET KEEPERS, AND BATTERS OF HIMACHAL PRADESH ON (BICEPS UNFLEXED, BICEPS FLEXED, THIGH GIRTH, AND CALF GIRTH).**

### DISCUSSION OF FINDINGS

When we talk about the findings of the study it specifies that there has been no noticeable difference found among 16 to 19 age group batters, wicket keepers, and fast bowlers of Himachal Pradesh 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 which were found less than the table value which was required to be significant at .05% level.

Probable reason might 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 different 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 wicket keepers and batters. But batsmen were found having lower resting pulse rate than fast bowlers and wicket keepers. With respect of strength, speed and endurance fast bowlers were found significantly better than batters and wicket keepers.

**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 evaluate 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, subscapular and calf skinfolds, percentage of body fat and back strength between the cricketers and control participants

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