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# A Comparative Study Of Selected Physical Variables Among Male Cricketers Of Himachal Pradesh

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**Abstract**

**Purpose:** The purpose of the study was to compare the selected physical variables (strength, speed, agility and flexibility) among fast bowlers, batters and wicket keepers, state and district level cricketers of Himachal Pradesh (India).

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

**Methods**: leg dynamometer in kilograms was used to record strength. For the measurement of Speed minimum time was noted in seconds for 30 meter dash. Shuttle Run Test was used to measure Agility which was recorded in seconds. To record the Flexibility Sit and Reach Box has been used.

**Statistics used:** (ANOVA) analysis of variance has been used with the help of SPSS software to test the significance difference in physical 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 speed, agility and flexibility variables but, there was a significant difference found on leg strength variable.

**Key words:** physical, cricketers, leg dynamometer, software.

## Introduction

Physical education starts from the very birth of a child. Physical activity includes play, exercise, games, sports, athletics, leisure and recreation. Exercise refers to exertion of muscles for health sake. Game denotes physical exertion for amusement or competition

governed by definite rules. Sports mean all those physical activities done for diversion, amusement, pleasure or success (Sharma, 2005). The game of cricket is believed to have been played in the organized form hundreds of years ago. Cricket was introduced to North America by the English colonies in the 17th century probably before it had even reached the north of England. In the 18th century it started in other parts of the globe. It was introduced to the West Indies by colonists and to India by British East India Company mariners in the first half of the century. It commenced in Australia almost as soon as the colonization began in 1788. Afterwards, New Zealand and South Africa followed in the early 19th century (Srivastava, 2007). Cricket is a sport in which fitness is traditionally not thought of as very important. However, the success in the 1990s and 2000s of the world beating Australian team has been attributed to their professionalism, and in part to the way they address their fitness. With the introduction of one day Cricket and more recently Twenty20, the game has gone through major changes and the physical demands made on a Cricketer's body have also increased dramatically. Depending on the version of the game being played and the role of the player in the team, the importance of fitness will vary: the fitness requirements of a fast bowler will be greater and also different than that of opening batters, and one-day Cricket will be more demanding than a test match (Chappell, 1978). Batsmen stay at the crease for as long as possible, sometimes for periods of over four

hours. In order to occupy this position, a good batters must be able to stay focused, have good ball / eye skills, and have the strength and fitness to make each played shot productive. Fielders need the ability to sustain a concentrated effort for a period of six hours or more without fatigue and in sometimes very warm conditions. The body must be capable of explosive bursts at any given time - such as racing for a ball jumpiong for a catch (Buchanan, J. 2008). Bowlers require both explosive strength and speed, combined with good muscular endurance, in order to be able to maintain a high count of number of overs. Poor fitness and muscular strength will result in inaccurate bowling and greater risk of injury, especially for high speed bowlers and also allows the batsmen to settle down in the wicket to score more runs. Flexibility is very important for a fast bowler. Flexibility is designed to give the bowler full freedom of movement when bowling a full speed, without threatening damage to his muscle. In general, strength is required when executing a powerful hit out of the ground or to bowl a bouncer; speed is required to take a quick single, to stop a ball before it crosses the boundary line; flexibility is shown by an acrobatic fielder; a square drive, a square cut speeding through the cordon of fielders shows a high degree of coordination and a pace bowler bowling through the entire session shows ample evidence of endurance (Chappell, 1978). (Kumar 2007) studied to compare the selected physical and anthropometric variables of javelin throwers and fast bowlers. Selected physical variables were strength and flexibility, these included arm strength, back strength, leg strength, wrist flexibility, shoulder flexibility, hip flexibility, ankle flexibility and spine flexibility. The anthropometric variables were weight, standing height, thigh girth, chest girth, leg length and arm length. The subjects

were thirty male sportsmen comprising of fifteen fast bowler and fifteen javelin throwers. The measures of all the selected variables were recorded at the human performance laboratory of Lakshmibai National Institute of Physical Education, Gwalior. The instrument used were leg and back dynamometer; flexometer, ruler guide, yard stick, simple goniometer, standard weighing machine and steel tape. The data were analyzed by using t-ratio for comparing the selected physical and anthropometric variables of javelin throwers and the fast bowlers. The level of confidence was set .05 level of confidence with 28 degree of freedom. The result of the study showed that there was significant difference in the arm strength, back strength and weight between fast bowlers and javelin throwers.
Objective of the study

The study was conducted with the objective to determine the physical variables (strength, speed, agility and flexibility) 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 physical 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 physical variables were: strength, speed, agility and flexibility. Strength was measured in nearest kilogram, speed and agility was measured in nearest seconds and flexibility was measured in nearest centimeters.

**Statistics used**

To find out the significance difference between fast bowlers, batters and wicket keepers on physical variables i.e., strength, speed, agility and flexibility 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 physical variables (strength, speed, agility, and flexibility) among fast bowlers, wicket keepers and batters of age groups 19-25 years cricketers has been presented in table no 1.

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

| Variable | Group | N | Mean | Std. Deviation | Std. Error |
|---|---|---|---|---|---|
| **STRENGTH** | Fast bowler | 20 | 146.25 | 22.70 | 5.07775 |
| | Wicket keepers | 20 | 127.30 | 19.56 | 4.37583 |
| | Batters | 20 | 146.20 | 15.09 | 3.37530 |
| **SPEED** | Fast bowler | 20 | 4.8950 | .377 | .08444 |
| | Wicket keepers | 20 | 5.0050 | .370 | .08287 |
| | Batters | 20 | 4.9200 | .19894 | .04449 |
| **AGILITY** | Fast bowler | 20 | 10.6750 | .74472 | .16652 |
| | Wicket keepers | 20 | 10.5150 | .54413 | .12167 |
| | Batters | 20 | 10.4300 | .61482 | .13748 |
| **FLEXIBILITY** | Fast bowler | 20 | 35.3400 | 7.26175 | 1.62378 |
| | Wicket keepers | 20 | 34.2250 | 6.38970 | 1.42878 |
| | Batters | 20 | 35.6550 | 6.26616 | 1.40116 |

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 PHYSICAL VARIABLES**

| Variable | Source of Variance | Sum of Squares | Df | Mean Square | F |
|---|---|---|---|---|---|
| **STRENGTH** | Between Group | 4775.433 | 2 | 2387.717 | **6.359*** |
| | Within Group | 21403.150 | 57 | 375.494 | |
| | Total | 26178.583 | 59 | | |
| **SPEED** | Between Group | .133 | 2 | .066 | .624 |
| | Within Group | 6.071 | 57 | .107 | |
| | Total | 6.204 | 59 | | |
| **AGILITY** | Between Group | .619 | 2 | .309 | .756 |
| | Within Group | 23.345 | 57 | .410 | |
| | Total | 23.964 | 59 | | |

| | | | | | |
|---|---|---|---|---|---|
| **FLEXIBILITY** | Between Group | 22.582 | 2 | 11.291 | .255 |
| | Within Group | 2523.695 | 57 | 44.275 | |
| | Total | 2546.277 | 59 | | |

*Significant at .05 level

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

The above results has shown a significant difference on strength variable as the obtained F value (6.35) was found to be greater than the table value of 3.15 as the required significant level was .05%, among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh, but there is no significant difference has been found on speed, agility, and flexibility variables as they obtained F values .624, .756, and .255 respectively, less than the table value of 3.15. Further, to find out exact significant differences on strength, Scheffe's post hoc test has been used. Table 3 shows the results of post hoc test of significance.

**TABLE-3 SIGNIFICANT DIFFERENCE BETWEEN THE PAIRED MEANS OF STRENGTH AMONG 16 TO 19 AGE GROUP FAST BOWLERS, WICKET KEEPERS, AND BATTERS OF HIMACHAL PRADESH**

| **Groups** | | | **Mean Difference** | **Significant`** |
|---|---|---|---|---|
| **Fast bowlers** | **Wicket KEEPERS** | **Batters** | | |
| 146.25 | 127.30 | | 18.95 | .012 |
| 146.25 | | 146.20 | 0.05 | 1.000 |
| | 127.30 | 146.20 | 18.90 | .012 |

Table 3 shows the existence of significant difference between fast bowlers and batters on strength since the value obtained was 1.000, no significant differences existed between fast bowlers & wicket keepers and wicket keepers & batters of 16 to 19 age group cricketers of Himachal Pradesh. Since the values obtained were .012 and .012 respectively. **Fig. 1** Shows the Mean scores of different three categories of Himachal Pradesh cricketers on strength variable.

**Figure-1**

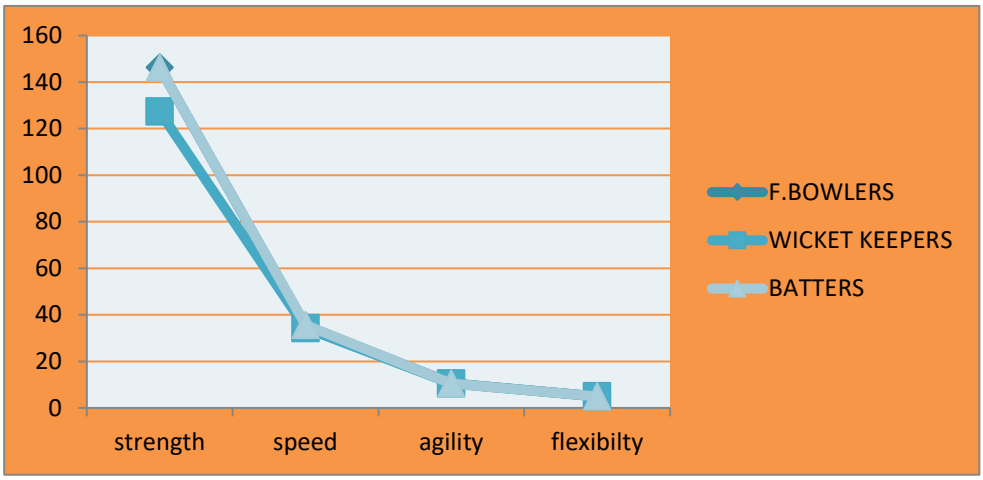


**Fig: 1. Graphical Representation of Mean Scores of 16 to 19 age groups Fast Bowlers, Wicket Keepers, and Batters of Himachal Pradesh on (strength, speed, agility, and flexibility).**

**Discussion of findings**

After the analysis of data a significant difference on strength variable as the obtained F value (6.35) was found to be greater than the table value of 3.15 as the required significant level was .05%, among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh, but there is no significant difference has been found on speed, agility, and flexibility variables as they obtained F values .624, .756, and .255 respectively which are less than the table value of 3.15.

There are very logical findings with respect to the selected physical variable i.e. strength, as the fast bowling needs tremendous amount of muscular strength.

The conditioning programme of fast bowlers is also sufficiently strenuous in comparison of wicket keepers and batters, though batters also required good amount of strength while playing strokes but less than fast bowlers and more than wicket keepers. Fast bowlers required heavier strength training programs than batters and wicket keepers. The study is supported by the study of (Koul 2009) a study on "anthropometric physiological and physical profiles of the cricketers" with purpose of preparing anthropometric physiological and physical profiles of cricketers. According to this study that subject 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 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 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, subscapular and calf skinfolds, percentage of body fat and back strength between the cricketers and control participants.

**Conclusion**

The study was concluded as there is a significant difference on strength variable as the obtained F value (6.35) was found to be greater than the table value of 3.15 as the required significant level was .05%, among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh, but there is no significant difference has been found on speed, agility, and flexibility variables as they obtained F values .624, .756, and .255 respectively which are less than the table value of 3.15.

There has been a significant difference found among 16 to 19 age group fast bowlers, wicket keepers and batters of Himachal Pradesh on strength variable as the obtained F value (6.35) was found to be greater than the table value of 3.15, which was required to be significant at .05% level, but there is no significant difference has been found on speed, agility, and flexibility variables as they obtained F values .624, .756, and .255 respectively which are less than the table value of 3.15. Further, to find out exact significant differences on strength, Scheffe's post hoc test has been used, which clearly showed that the significant difference existed between fast bowlers and batters on strength since the value obtained was 1.000, no significant differences existed between fast bowlers & wicket keepers and wicket keepers & batters of 16 to 19 age group cricketers of Himachal Pradesh. Since the values obtained were .012 and .012 respectively.

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