

# Femurs and Humerus Bi-Epicondyle of State Level Runners and Footballers: A Comparative Study

Dr. Bhupender Singh

Assistant Professor, Department of Physical Education, JVMGRR College, Charkhi Dadri (Haryana)

## ABSTRACT

The purpose of the present study is to find out the Femurs and Humerus bi-epicondyle diameter differences of state level runners and the footballers. For the present study, total 80 students from state level athletic competition and northern level football competition were randomly selected. ANOVA was applied on gathered data. Level of significance of findings of this study was set at 0.05 levels. Findings of the study revealed significance difference in Humerus bi-epicondyle diameter and femurs bi-epicondyle diameter among state level runners and footballers.

**Key words:-** Bi-epicondyle, Femurs, Footballer, Humerus, Runner.

## INTRODUCTION

The game of soccer is both an art and a science. It includes running, passing, kicking, and tackling, blocking, heading, juggling and dribbling techniques. All these activities often have to be done at high speed. These individual skills are very important, but remember that this is a team game and players must work together to attack or defend. Players should therefore develop an understanding of their skills and their contribution according to the requirements of the game. Football games come with physical challenges. Even though two players are of equal skill, their physical and mental reactions are different, which can make a big difference in their performance. Players must be able to quickly assess and respond to situations. Strikers must decide between passes and shots, defenders between covers, and goalkeepers must decide whether to defend, stay in goal or run forward or sideways.

Athletics now consists of running, hurdling, jumping and throwing competitions, fought between individuals and teams in indoor and outdoor meetings. Running and hurdling competitions constitute track competitions, while jumping and throwing competitions constitute field competitions. In many countries, the sport as a whole is called athletics. Running races are the most famous track events. Ranging in length from an indoor 50mtrs. run to an outdoor marathon.

To sprint is to run at maximum speed over a short distance. It is used in many sports that involve running and is usually used to quickly reach a goal or goal, or to evade or catch an opponent. It cannot last longer than ~35 seconds. Excessive metabolic acidosis secondary to anaerobic glycolysis (<https://thea.com/sprint-run>) medium distance events include 'races' over 800, 1500 and 3000 meters. Middle distance runners rely on a combination of speed and endurance. They need to stay competitive, but their speed needs to be carefully adjusted so they don't tire too quickly. Some middle-distance runners change their speed several times during the race, while others maintain a constant pace throughout the race. Nurmi, who dominated track and field in the 1920s, wore a stopwatch to check his pace during races. An important element in middle-distance races is the final sprint of the final lap, the kick. Running form for middle-distance events is very different from sprinting. In intermediate distance events, knee action is less pronounced, strides are shorter, and forward lean is less extreme. Physiologically, it is primarily aerobic in nature, requiring stamina and mental toughness (Grine, Frederick E. et al. - 2006).

It is suitable. This is especially true of primates. The endurance running hypothesis suggests that endurance running in the genus Homo arose because migration over large areas improved foraging opportunities and enabled endurance hunting.

The capacity for endurance running is also found in migratory ungulates and a limited number of terrestrial carnivores, such as dogs, wolves and hyenas (Science Week, 2004-2005).

Cureton (1941), stated that in general, people with long legs and long arms and relatively short and small trunks were physically weak in long sustained heavy work, but they might show great speed and endurance at high levels of athletic activity. Long third-class levers are noted for speed and range of action as well as for their efficiency for force.

However as man develops from birth to maturity some of the most observable changes in his body are those of his physical characteristics - his height, weight, shape and proportions. The patterns of growth of these characteristics result responsible for the performance of a sportsman from the interaction of both inborn (genetic) and environmental factors, which are

Thus physical characteristics play a very vital role in all games and sports whether it is team or individual game, ideal body segments as per the demand of the particular event is necessary for higher achievement in that particular sport. Anthropometric variations play an important role in athlete performance. Let's discuss certain important aspects related to it.

**Procedure:-**

**Selection:-** For the purpose of this present study total 60 male runners (20 each of Sprints, Middle Distance Running, and Long Distance Running) were randomly selected from 25<sup>th</sup> Uttar Pradesh State Open Athletics Championship 2017 held on 05<sup>th</sup> to 07<sup>th</sup> May, 2021 held at Amroha. Total 25 Football players who represent Uttar Pradesh Universities at North Zone Intervarsity Tournament held at C.C.S. University, Meerut on dated 06<sup>th</sup> to 11<sup>th</sup> February, 2021 were randomly selected.

**Tools and instruments:-** Following instruments were used for the purpose of collecting the data:-

- i. Sliding caliper
- ii. Vernier caliper

During diameter measurements, the result of measurement ensured to be more reliable by using the sliding caliper so as to apply as much pressure as possible to the soft tissue (Tamer, 2000). Each measurement was measured twice. Humerus and Femurs epicondyle diameters of the participants were measured.

The data in the form of criterion measure of study described above were collected through the following methods-

- i. Humerus Bi-Epicondyle Diameter:-** The subject's right arm was raised forward to the horizontal and the forearm flexed to right angle at elbow. The distance between medial and lateral epicondyle of the humerus was measured with the help of Venire caliper and the value was recorded.
- ii. Femurs Bi-Epicondyle Diameter:-** The subject was made to sit and the right leg was flexed at the knee to from a right angle with thigh. The distance between medial and lateral epicondyle of the femur was measured with the help of venire caliper and the value was recorded.

**Statistical Procedure:-**

Reiterating the objective of the study, we have to point out that we intend to investigate the Bi-epicondyle diameters among Sprinters, Middle distance runners, Long Distance Runners and Football Players. Thus we had used analysis of variance to found out the significant difference among the Sprinters, Middle Distance Runners, Long distance Runners and Football players. Where the difference was significant, L.S.D. had been used test to analyses, which groups mean was greater than other. The differences in the Bi-epicondyle diameters of sprinters, middle distance runners and long distance runners and football players were tested at 0.05 levels of Significance.

**Table 1: Humerus Bi-Epicondyle diameter (\* Significance at 0.05 level)**

Source of Variance	DF	SS	MSS	F Value
Treatment	3	2.00865	0.66853	3.975872*
Error	76	12.78685	0.168255	

Source: Computed from Primary data

Since calculate F Value is greater than tabulated F Value, the hypothesis is accepted and we conclude that significant difference is existing in the mean humorous Bi-epicondyle of Sprinter, Middle distance Runner, Long Distance Runners and football players.

To further find out which group mean humorous Bi-epicondyle is greater than the other, pair wise means analysis is done through LSD test.

**Table 2: LSD Test of Humerus Bi-Epicondyle (\* Significance at 0.05% level)**

Footballers	Middle Distance	Sprinters	LDR	Mean Difference	CD Mean
6.923	6.8825			0.0325	
6.923		6.842		0.08	
6.923			6.5275	0.3965*	0.256816
	6.8825	6.842		0.0468	
	6.8825		6.5275	0.365*	
		6.842	6.5275	0.3169	

Source: Computed from Primary data

Comparing the pair wise mean difference with critical difference we are able to conclude that mean humorous Bi - Epicondyle of footballers, Middle distance Runner and Sprinters are significantly greater than the mean humorous Bi - Epicondyle of long distance runners. Whereas the mean humorous Bi - Epicondyle is insignificantly different among Footballer and middle distance runners, Footballers and sprinters, Middle distance runners and Sprinters.

Since calculate F Value is greater than tabulated F Value, the hypothesis is accepted and we conclude that significant difference is existing in the mean humorous Bi-epicondyle of Sprinter, Middle distance Runner, Long Distance Runners and football players. To further find out which group mean humorous Bi-epicondyle is greater than the other, pair wise means analysis is done through LSD test.

**Table 3: Femurs Bi-epicondyle Diameter (\* Significance at 0.95 level)**

Source of Variance	DF	SS	MSS	F Value
Treatment	4	1.345744	0.448515	3.080948
Error	77	11.06548	0.14571	

Source: Computed from Primary data

**Table 4: LSD Test of Femurs Bi-epicondyle (\* Significance at 0.5% level)**

Footballers	Middle Distance	Sprinters	LDR	Mean Difference	CD Mean
8.817	8.73			0.106	
8.817		8.6027		0.2125	
8.817			8.467	0.36*	0.238825
	8.73	8.6027		0.1074	
	8.73	8.6027	8.467	0.245*	
			8.467	0.1375	

Source: Computed from Primary data

Comparing the pair wise mean difference with critical difference we are able to conclude that mean Femurs Bi-Epicondyle of footballers, Middle distance Runner and Sprinters are significantly greater than the mean Femurs Bi-Epicondyle of long distance runners.

Whereas the mean Femurs Bi-Epicondyle is insignificantly different among Footballer and middle distance runners, Footballers and sprinters, Middle distance runners and Sprinters.

## **FINDINGS**

**Humerus Bi-Epicondyle Diameter:-** Mean humerus Bi-Epicondyle of footballers, Middle distance Runner and Sprinters are significantly greater than the mean humerus Bi-Epicondyle of long distance runners. Whereas the mean humerus Bi-Epicondyle is insignificantly different among Footballer and middle distance runners, Footballers and sprinters, Middle distance runners and Sprinters.

**Femurs Bi-Epicondyle Diameter:-** Mean Femurs Bi-Epicondyle of footballers and Middle distance Runner are significantly greater than the mean Femurs Bi-Epicondyle of long distance runners. Whereas the mean Femurs Bi - Epicondyle is significantly different among footballer and middle distance runners, Footballs and Sprinters, middle distance runners and Sprinters.

## **CONCLUSION**

The findings of this investigation are in agreement with those reported in previous similar studies. Kansal (1982), in an attempt to develop scientific criteria for the selection of budding athletes based on their morphological status studies 250 male students in the age group of 11 to 17 years. Their height, weight, bi-sacromial, humerus, bi-Epicondyle, chest and calf circumference and performance in 100 meters running, shot put and standing broad jump were examined. He concluded that the above said body tests studied. Measurement showed significant degree of relationship with individual performance

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