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# Positional Differences in Body Fat percentage among University Level Soccer Players of North-Eastern India

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## 1 INTRODUCTION:

Soccer (the craziest sports) depends on mostly Physical fitness, mental stability, tactical and technical skill and more on. In physical fitness body composition – particularly Body Fat Percentage (BF%)- is a crucial detrimental for soccer performance. Having excessive adipose tissue act as a non-functional mass, which negatively affect sprinting, jumping, accelerating, and changing direction for footballers. Because of this specific-sports needs optimum level of body fat and fat-free mass are important without compromising technical skill. Many studies have emphasized on effectiveness of lower fat levels on different types of athletes. Despite this study has focused on the profiling on body fat, among footballers of different position. Furthermore, this study also covered the north-eastern participating University in Inter-university competition 2024.

## 2 METHODOLOGY:

### 2.1. Selection of Subject:

For this study, total Ninety (n=90) samples were selected from six different Inter-university participating teams. The age range of the subjects were 18-23 years. From each north-eastern state one University was selected and from each University 15 players were considered for the study on their playing position. The break-up of the subjects has been given below:

**Table-1**

**POSITIONAL WISE DIVISION OF PLAYERS**

| **Position of the players** | **Number of the players** |
|---|---|
| Goalkeeper | 15 |
| Midfielder | 40 |
| Forward | 35 |
| **Total** | **90** |

**For the demand of the study all the defenders were considered as Midfielder

### 2.2. Selection of Variables and Tools:

For the present study below mentioned Variables were selected:

**A) PERSONAL DATA**

- ❖ Age
- ❖ Standing Height (m)
- ❖ Body Weight (Kg)

**B) ANTHROPOMETRIC VARIABLES**

- ❖ Skinfold (Jackson and Pollock 3-Site Calliper Method)

The entire data was collected with the help of expert. The instruments used for this study, were in good condition and made by the standard companies. Their calibration was accepted as reliable as par with international standard. Table-2 presented criterion of the test were conducted to collect the data.

**Table-2**
**CRITERION MEASURE**

| Sl. No. | Variables | Equipments/ Test Used | Unit of Measure |
|---|---|---|---|
| **1.** | **Personal Data** | | |
| a) | Age | Date of Birth certificate | Years |
| b) | Standing Height | Stadiometer | Centimeter |
| c) | Body Weight | Standard Weighing machine | Kilogram |
| **2.** | **Anthropometric Variables** | | |
| a) | Skinfold | Harpenden Skinfold Calliper and marker pen | Millimetre |

### 2.3. Administration of the test:

The test has been administrated with the help of expert and follow the standard manual of each test. Here are some visuals of data collection:



### 2.4. Statistical Procedure:

In descriptive statistics Mean and SD was used for the present study, and the level of significance was set at 0.05 level. For determining the significance among 3 (three) groups, one-way ANOVA was used. For checking the significance and mean difference Tukey HSD test was used.

## 3 RESULT AND FINDINGS:

### 3.1. Results:

Table- 3 presented the descriptive statistics of personal data according to their position.

**Table-3**

**DESCRIPTIVE STATISTICS OF PERSONAL DATA**

| Variable | Position | | | |
|---|---|---|---|---|
| Personal Data | | Goalkeeper | Midfielder | Forward |
| | | X+/-S.D | X+/-S.D | X+/-S.D |
| | Height | 1.72 | 1.67 | 1.65 |
| | | +/- 0.05 | +/- 0.05 | +/- 0.06 |
| | Weight | 65.68 | 59.5 | 56.19 |
| | | +/- 5.63 | +/- 4.07 | +/- 4.93 |

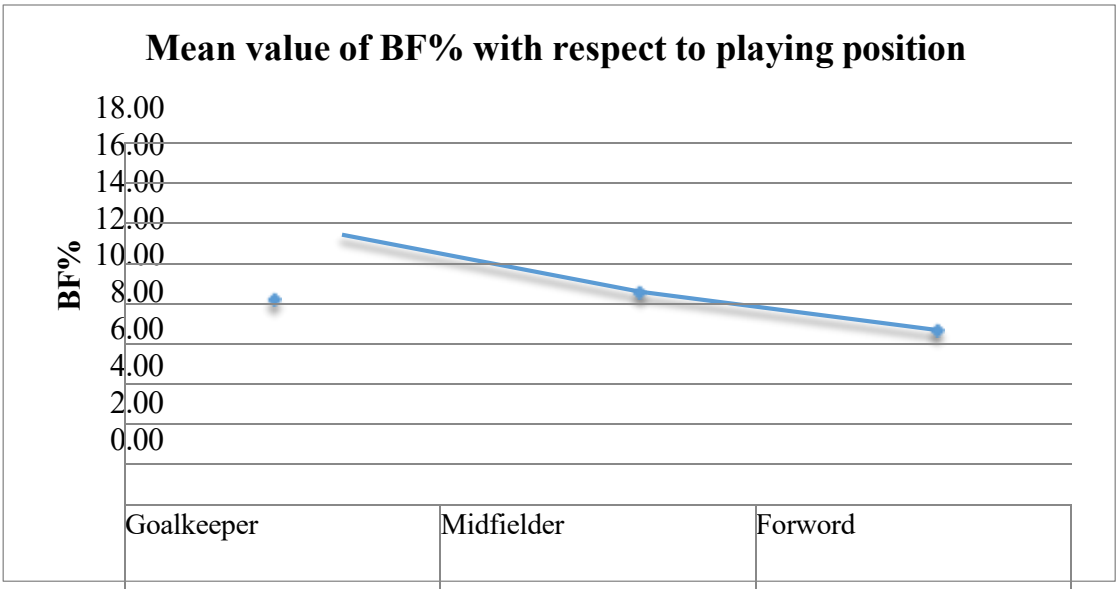
From the table 3, it was observed that in personal data the mean and SD of height variable as per playing position were as goalkeeper 1.72 ± 0.05, Midfielder 1.67 ± 0.05 and forward 1.65 ± 0.06.

In weight variable the average mean values were 65.68 ± 5.63, Midfielder 59.5 ± 4.07 and forward

56.19 ± 4.93 respectively. This table showed that goalkeepers 65.68 were heavier than the midfielder 59.5 and forward 56.19 accordingly.

**Figure-1**

**Graphical Presentation of Body Fat Percentage**



According to the Figure-1, goalkeeper 11.13 ± 4.58 were having highest level of body fat followed by midfielder 8.03 ± 2.60 and forward 5.94 ± 1.89. Moreover, according to the American Council on Exercise forward player's falls in essential fat (2-5%) and goalkeeper and midfielder were in athletic (6-13%) body fat percentage level (ACE Fit, 2017).

**Table-4**

**ANOVA table of BF% among different playing position**

| Parameter | Sources of variance | Some of square (SS) | df | Mean square (MS) | F | P-value |
|---|---|---|---|---|---|---|
| BF% | Between group | 289.01 | 2 | 144.50 | 18.53 | 2E-07* |
| | Within group | 678.59 | 87 | 7.80 | | |
| | Total | 967.6 | 89 | | | |

***Significant at 0.05 level**

The ANOVA table indicated that there was a significant difference between the three groups of playing position with respect of their body fat percentage at 0.05 levels of significance and the tabulated F – value 18.53 was greater than the critical value.

Hence, to find out the significance of F – value and the mean difference Post-Hoc test was carried out.

**Table – 5**

**Tukey HSD test of BF% among different playing position**

| Parameter | Group (Team) | Mean difference | P- value |
|---|---|---|---|
| Body Fat Percentage | Goalkeeper - Forward | 5.190 | 0.00* |
| | Midfielder - Forward | 2.082 | 0.00* |
| | Midfielder – Goalkeeper | -3.108 | 0.00* |

***Significant at 0.05 level**

**Pairwise comparison**

The Post-Hoc table 44 explained that the mean difference of body fat percentage as per their positions were Goalkeeper – Forward 5.190, Midfielder – Forward 2.082 and Midfielder – Goalkeeper -3.108 respectively. This table also showed there was significant difference found between all the groups at 0.05 level of confidence.

### 3.2. Findings:

In body fat percentage, the study observed the goalkeepers were having highest body fat percentage. According to the study they were in athletic body fat categories (6-13%, ACE Fit, 2017). Second placed was taken by midfielder and considered as athletic body fat categories. The forward held the third position and they were considered as essential body

fat percentage categories (2-5%, ACE Fit, 2017). Study reflects a significance difference in terms of body fat percentage involving groups. Maamer Slimani et al, 2017 had been investigated a meta- analytical study on the percentage of body fat level in soccer players according to their competition level, playing positions and age groups. They also proved a significance difference between goalkeeper, defender, midfielder and forward. This result also supports the present study. After applying Post- Hoc test indicated the difference between all the groups i.e. Goalkeeper – Forward, Midfielder – Forward and Midfielder – Goalkeeper.

## 4 CONCLUSIONS:

This study concluded as:

1. Among all the three groups, Goalkeepers are tallest and heaviest than the midfielder and forward players in North-eastern University teams.
2. Even though, North-eastern Universities goalkeepers are having higher body fat percentage than midfielder and forward. Moreover, the goalkeeper and midfielder are in athletic body fat category (6-13%, ACE Fit, 2017) and forward in essential fat level (2 -5%, ACE Fit, 2017).

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