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**Subhadip Pal**
M. P. Ed. student, Department of Physical Education, Jadavpur University Jadavpur, Kolkata, West Bengal, India

**Dr. Krishnendu Pradhan**
Assistant Professor & HoD, Department of Physical Education, Garhbeta College, Paschim Medinipur, West Bengal, India

**Dr. Sudip Sundar Das**
Professor, Department of Physical Education, Jadavpur University, Jadavpur, Kolkata, West Bengal, India

## Comparison of body composition characteristics between district level football players and kho-kho players

**Subhadip Pal, Dr. Krishnendu Pradhan and Dr. Sudip Sundar Das**

**Abstract**
The purpose of the study was to examine the body composition characteristics between different district of male football and kho-kho players in West Bengal, India. To achieve the set objectives, sixty (60) male different district level football and kho-kho players (average age 21.08±1.94 years) from different sports club who were participated to their respective sports as subjects in this study. The age of the subject ranged from 18-26 years. The subjects were categorized as football players (30) and kho-kho players (30). Only body composition component were selected for this study. The height and weight of the subjects were measured with the help of anthropometric rod and portable weighing machine respectively. Body mass index (BMI), total body fat, fat percent and lean body mass of both the groups were calculated by the using recommended formulas of Meltzer *et al*. (1988) [4], Shaver (1981) [5], Karada Scan body composition monitor and Shaver (1981) [5] respectively. Data was analyzed using Independent Sample 't' test with SPSS, (Version 20.0) software. The level of significance was set at 0.05 level of confidence. The result shows that there was significant difference in lean body mass between district level football players and kho-kho players. No significant differences exist in height, weight, body mass index (BMI), and total body fat and fat percent between two groups of players.

**Keywords:** Body composition, football players, kho-kho players

## Introduction
Body composition is an important health and performance variable in the field of physical education and sports. Assessment of body composition is an important component of the ongoing monitoring of athletes interested to improve their performance in sports field. In weight-sensitive sports, many athletes use extreme methods to reduce mass rapidly or maintain a low mass in order to gain a competitive advantage. As a consequence, athletes with very low body mass, extreme mass changes due to dehydration or eating disorders, an extremely low percentage of fat, or insufficient bone mineral density, are becoming common issues in many sports (Albright and Stern 1998) [1]. Changes in athletes' body weight and body composition are correlated to state of training, training level and caloric intake. In most sports the athlete will try to keep his/ her levels of body fat to a minimum. Also the body composition and body fat is important for weight category sports (as diving, judo, wrestling, boxing, weight lifting) in order to choose the realistic weight category. If an athlete already has low body fat, then significant weight loss could only be achieved by loss of lean body mass, which can compromise strength and endurance capacity (Burke and Deakin, 2002) [2]. Aesthetic sports such as gymnastics, diving, figure skating are in essence weight category sports, as a low body mass and an ideal body composition are requirements. Assessment weight and body composition give us useful information for athletes' training and nutrition. Usually, BMI is used to estimate one's normal weight. But, body weight and BMI do not give information about body fat (Lohman *et al*. 2000) [3].
Body composition refers to the makeup of lean tissue and fat tissue in the body. Lean tissue is composed of muscle, bone and organs. Fat tissue is composed of three different categories: essential fat, storage fat and non-essential fat. Essential and storage fat are both necessary for the body to function, while non-essential fat serves no real purpose. It refers to the relative amount of muscle, fat, bone and another vital component of the body. Body compositions are

**Correspondence**
**Subhadip Pal**
M. P. Ed. student, Department of Physical Education, Jadavpur University Jadavpur, Kolkata, West Bengal, India

important to consider for health. The components of body composition are lean body mass, total body fat, % of body fat and body mass index (BMI). All body tissue except storage fat. Lean body mass is made up of structural and functional elements in cells, body water, muscle, bones and other body organs such as heart, liver and kidneys. BMI provides a simple numeric measure of a person's thickness or thinness, allowing health professionals to discuss overweight or underweight problems. The researchers were very much interested to investigate about body composition between state level young male football players and kho-kho players of different age groups. It was presumed that different components of body composition are most important factors in football and kho-kho games. However, there is no such information concerning the differentiation of some parameters in football players and kho-kho players according to their body composition. An understanding of body composition of football players and kho-kho players may be important for talent identification in football and kho-kho games and preparation of pre-competition training schedule for progressive performance in football and kho-kho games.

## Purpose of the study
The purpose of the present study was to compare the body composition characteristics between district level male football and kho-kho players.

## Delimitations
i. The subjects for this study were selected from different sports club in different districts of West Bengal.
ii. Each group consists of 30 male subjects and their age ranged from 18 to 26 years.

## Limitations
i. In this study, the difference regarding the diet, cast, geographical and natural conditions was not taken into consideration.
ii. The instruments used for collecting data also were not of very high quality and precision.

## Significance of the Study
i. The study was significant on the following points:
ii. It helps to screening the players for different games and sports.
iii. The findings of this study help to know the body composition characteristics of football and kho-kho players.
iv. The results would be helpful for talent identification for football and kho-kho players.

## Hypothesis
It is hypothesised that, there may be significant difference in body composition characteristics between district level male football and kho-kho players.

## Methods and Materials
**Subjects:** A total 60 players consists of 30 each groups of two games (football and kho-kho) average age $21.08 \pm 1.94$ years were selected as subjects for this study. The age of the subjects were calculated according to their M. P. Admit card.

## Collection of the data
For the purpose of the collection of data all tests were conducted in the following order. The age of the subjects recorded in nearest in year as per their Madhyamik Admit. The height and weight of the all subjects were measured by stadiometer and weighing machine respectively. Body mass index (BMI), total body fat, fat percent and lean body mass (LBM) of the subjects were calculated by the using recommended formulas of Meltzer *et al*. (1988) [4], Shaver (1981) [5], Karada Scan body composition monitor Shaver (1981) [5] respectively. Prior to the administration of tests, a meeting of the subjects was held in the presence of researcher, coaches and other recorders. The requirements of the testing procedures were explained to them in detail so that there was no ambiguity in their minds regarding the efforts required of them.

## Criterion Measur

| Parameter | Unit | Measurement Procedure |
|---|---|---|
| Height | cm | Stadiometer |
| Weight | Kg | Weighing mechine |
| Body mass index (BMI) | $Kg/mt^2$ | $\dfrac{\text{Weight in kilogram}}{\text{Height in meter}^2}$ |
| Total body fat | Kg | $\dfrac{\text{Weight x body fat percent}}{100}$ |
| Fat percent | % | Body Composition Monitor: (Omran, HBF-375) |
| Lean body mass | Kg | Body weight-Total body fat |

## Statistical procedure
For the purpose of analysis of data descriptive statistics the mean, standard deviation and mean difference were obtained through the Statistical Package for Social Studies, (SPSS, Version 20, Inc. Chicago, Illinois). To determine the significant difference between the mean scores of subjects belonging to football players and kho-kho players on body composition characteristics the Independent-Samples 't'-test was applied. The level of significance was set at 0.05.

## Results
The research that was conducted aimed to determine the differences in body composition characteristics between district level male football and kho-kho players. Results of Independent Sample 't' test of district level male football and kho-kho players are presented in Table 1.

**Table 1**

| Body composition characteristics | Football | | Kho-kho | | M. D. | t-value | Sig (2 tailed) | S/NS |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | | | |
| Height | 166.03 | 6.46 | 165.27 | 4.31 | 0.76 | 0.54 | 0.59 | NS |
| Weight | 59.81 | 7.60 | 56.28 | 7.37 | 3.53 | 1.82 | 0.07 | NS |
| Body mass index (BMI) | 21.76 | 2.18 | 20.59 | 2.42 | 1.17 | 1.96 | 0.05 | NS |
| Total body fat | 9.47 | 3.00 | 8.68 | 3.95 | 0.79 | 0.87 | 0.39 | NS |
| Fat percent | 15.56 | 3.31 | 14.99 | 4.83 | 0.57 | 0.53 | 0.59 | NS |
| Lean body mass | 50.34 | 5.24 | 47.60 | 4.46 | 2.74 | 2.18* | 0.03 | S |

T =2.00{0.05(2, 58)} *Significant at 0.05

M. D =Mean difference, SD =Standard Deviation, S =Significant and NS =Not significant.

The findings of table 1 clearly indicated that there were no significant differences at 0.05 level of confidence in height, weight, body mass index (BMI), total body fat and fat percent of body composition characteristics between district level male football and kho-kho players. In lean body mass there was significant difference exist between district level male football and kho-kho players. The findings of the results of district level male football and kho-kho players have been presented in Figure 1.
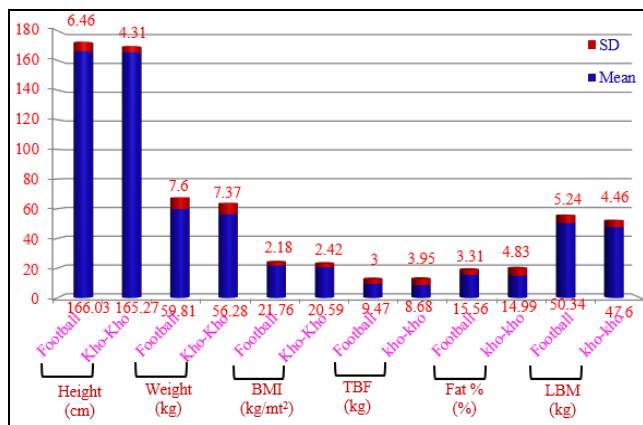


**Fig 1:** Shows the Mean and SD of Body composition characteristics

## Discussion of findings

It appears from the table 1, that the mean and standard deviation of district level football and kho-kho players are 166.03±6.46 cm and 165.27±4.31 cm respectively in relation to their height component. The football players of district level are having the better in height i.e. 166.03 cm in average, there is a difference 0.76 cm. The t-value is 0.54. From table 1 it was found that no significant difference exists at 0.05 level of confidence between district level football and kho-kho players in height of the component. It appears from the table 1, that the mean and standard deviation of district level football and kho-kho players are 59.81±7.60 kg and 56.28±7.37 kg respectively in relation to weight component. The football player of district level are having the heavier in weight i. e. 59.81 kg averages, there is a difference 3.53 kg. The t-value is 1.82. From table 1 it was found that there is no significant difference exists at 0.05 level of confidence between district level football and kho-kho players in the component of weight. It appears from the table 1, that the mean and standard deviation of district level football and kho-kho players are 21.76±2.18 kg/m$^2$ and 20.59±2.42 kg/m$^2$ respectively in relation to body mass index (BMI) component. The football players of district level are having the better in body mass index (BMI) score i. e. 21.76 kg/m$^2$ averages. There is a difference in 1.17 kg/m$^2$ and the t-value is 1.96. From the table 1 it was found that there was no significant difference exists at 0.05 level of confidence between district level football and kho-kho players in body mass index (BMI) component.

It appears from the table 1, that the mean and standard deviation of district level football and kho-kho players are 9.47±3.00 kg and 8.68±3.95 kg respectively in relation to total body fat component. The football players of district level are having the higher in their total body fat i. e. 9.47 averages, there is a difference 0.79 kg. The t-value is 0.87. From the table 1 it was found that there was no significant difference exit at 0.05 level of confidence between district level football and kho-kho players in the component of total body fat. It appears from the table 1, that the mean and standard deviation of district level football and kho-kho players are 15.56±3.31% and 14.99±4.83% respectively in relation to fat percent component. The football player of district level are having the better in fat percentage i. e. 15.56% average, there is a difference 0.53%. The t-value is 0.59. From the table 1 it was found that there was no significant difference exists at 0.05 level of confidence between district level football and kho-kho players in the component of fat percentage. It appears in the table 1 that mean and standard deviation of district level football and kho-kho players is 50.34±5.24 kg and 47.60±4.46 kg respectively in relation to their lean body mass component. The football player of district level are having the better in lean body mass i. e. 50.34 kg averages, there is a difference 2.18 kg. The t-value is 0.03. From the table 1 it was found that there was a significant difference exists at 0.05 level of confidence between district level football and kho-kho players in the component of lean body mass.

## Discussion of hypothesis

It was hypothesised that there may be significant difference in body composition characteristics between district level male football and kho-kho players. From the above findings of the present study it is obvious that there are no significant differences were found between district level male football and kho-kho players in height, weight, body mass index (BMI), total body fat, fat percent. So, in this respect we may say that the Hypothesis is rejected. In lean body mass body composition component there was significantly difference observed between district level football and kho-kho players. So in this component the Hypothesis is accepted.

## Conclusion

It was concluded that there were no significant difference observed in height, weight, body mass index (BMI), total body fat and fat percent between district level football and kho-kho players. But in lean body mass there was a significant difference found among district level football and kho-kho players.

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