



ISSN: 2456-4419

Impact Factor: (RJIF): 5.18

Yoga 2019; 4(1): 846-850

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www.theyogicjournal.com

Received: 07-11-2018

Accepted: 09-12-2018

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Study of body composition among university level male football players of north-eastern region: A comparative study

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Abstract

The purpose of the study was to compare Body Composition among the difference University level football players of North-eastern part of India. For the study total One hundred two (n=102) male students were selected from six difference Universities of north-east. 17 football players were randomly selected, the age range of the subjects were 18-25 years. The body composition was assessed in the form of BMI, WHR and BF% at 0.05 significance level. The study indicated that there was no significance difference on BMI, WHR and BF% among the six difference University level football players of North-east.

Keywords: Body composition, North-east

Introduction

In today's world, the rising of overweight and obesity is a major problem of public health which resulting in numerous diseases and health disturbances. Various researches have confirmed that around 6 percent of the total public health expenditure worldwide is related to physical inactivity, and overweight and obesity. Now a day it is a serious issue of student's life causing their secondary lifestyle. They are very much attending with the digital world rather than ground. So it's a common problem with today's student's life. Anthropometry is a method for the assessment of their physique i.e. BMI, WHR, BF% and so on. According to Dictionary, it is the measurement of the size and proportions of the human body. BMI is widely the most used method to check nutritional status in adults. It is defined as a person's weight in kilograms divided by the square of the person's height in meters (kg/m^2). According to WHO for 20 years old adults normal BMI is 18.5-28.9, below them, are underweight and over are overweight and obese. The BF% increase is in a direct relation to BMI values, especially among children and adolescents (Krebs *et al.*, 2007) ^[13]; however, there are certain studies that have found some deviations in body composition values in that respect. The BMI takes into account both body fat and muscles, so it can sometimes be a very misleading indicator of overweight and obesity, particularly among people who have a normal or relatively low level of BF% (Bray, DeLany, Volaufova, Harsha, & Champagne, 2002) ^[5], e.g. the population of athletes (Crnobrnja *et al.*, 2012) ^[5]. Therefore, the Body Fat Percentage stands in a better correlation to overweight and obesity assessment than BMI (Freedman, Ogden, & Kit, 2015) ^[9]. This is particularly true for the young population whose BMI values serve as a less reliable predictor of overweight and obesity compared to middle-age people (Dagan, Segev, Novikov, & Dankner, 2013) ^[7]. Waist-hip ratio or waist-to-hip ratio (WHR) is calculated as waist measurement divided by hip measurement ($W \div H$). It is a dimensionless ratio of the circumference of the waist to that of the hips. Measuring WHR helps or used as an indicator of health and the risk of developing serious health conditions in an individual. WHR correlates with fecundity (with different optimal values in males and females).

Body composition: Body composition is a medium to define the percentage of fat, bone, muscle water in the human body.

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North-east Football: Northeast comprises eight states, Assam, Tripura, Manipur, Nagaland, Mizoram, Arunachal Pradesh, and Meghalaya known as Land of Seven Sisters States and Sikkim as One Brother. North-eastern states have been proving their massive dedication and dominance on Indian football. The youth of northeast are heavily inclining towards sporting activities and football is one of the craziest games according to their state. When the Indian Super League has formed the organizers made a unanimous decision that the North East must have its own chapter. Baichung Bhutia is very well known as a player who was the star striker for the East Bengal I League football team. He is famous as the Sikkimese Sniper because of his efficient football shooting skills. The contribution of North East in Indian Football is remarkable. In the ongoing Indian Super League (ISL), more than 30 players from the North-eastern states are playing for the ten clubs in the tournament. In Indian professional football scene, over 40 percent players are from Northeast region. These show the dominance of Northeast in the football, which is increasingly becoming popular in our country.

Objective of the Study

The objective of the study was to compare the body composition status of the university level male footballers of North-eastern region of India. The body composition was assessed in the form of BMI, WHR and BF%. Data were collected from six different Universities, located at six different states of North-Eastern part of India. This may help to understand the health status of the University level Footballers of North-eastern part. This study hypothesised that there was no significant different among six groups of footballers.

Method

Selection of subject

This study includes a total One hundred Two (n=102) male footballers from three different universities of North-east. 17 footballers were randomly selected from each university

football team as subject of this study. The age range of the subjects were 18-25 years.

Variables

1. WHR (Waist Hip Ratio) Measured from waist and hip Circumference.
2. BMI (Body Mass Index) Measured from height and weight.
3. BF% (Body Fat Percentage) Measured from age and skinfold measurements.

Tools for data collection

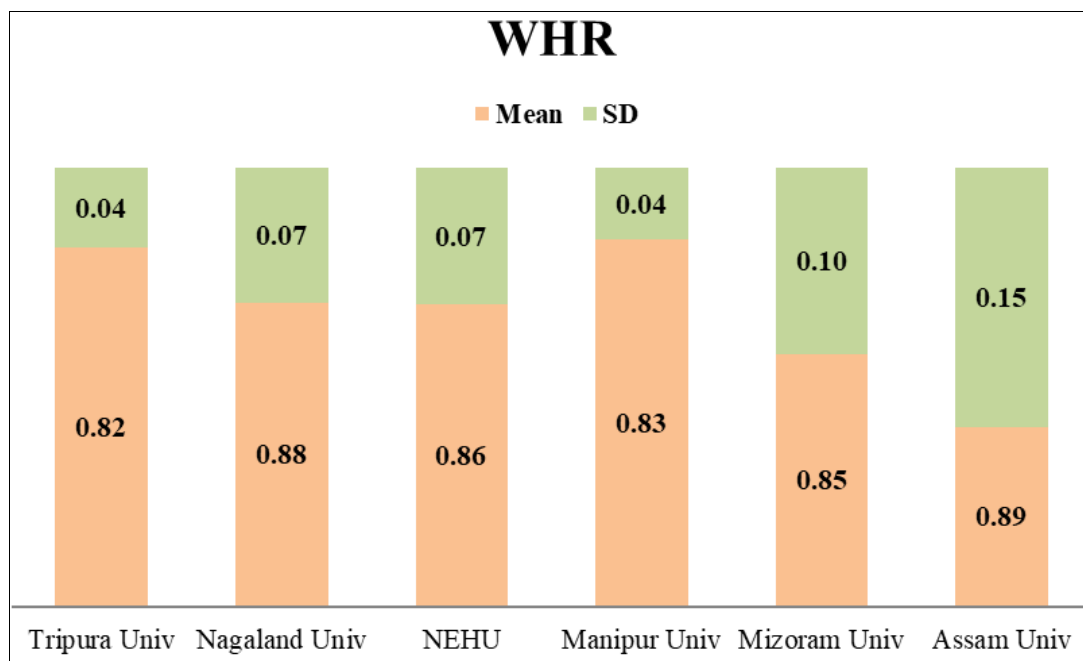
1. The data were collected following the standard data collection procedure.
2. Age = Recorded from Birth Certificate.
3. Height = Measured by Stadiometer and recorded in nearest centimetre (cm)
4. Weight = Measured by Weighing Machine and recorded in kilogram
5. Waist Circumference = Measured by Anthropometric tape.
6. Hip Circumference = Measured by Anthropometric tape.
7. Skinfold for BF% = The body fat calculation based on the Jackson and Pollock 3-site calliper Method. All three sites skinfold measured by Harpenden skinfold calliper.

Statistical analysis of Data

For the purpose of the study descriptive statistics of Mean was used for to find out the average value, SD was used for determine the consistency of mean among the group and ANOVA was employed to determine the difference among those six groups. The level of significance was set at 0.05.

Result and discussion

Findings pertaining to WHR were subjected to descriptive analysis of Mean, Standard deviation and ANOVA technique for analysis had been presented below.



Source: Primary data collected by the researcher, October, 2018 Legend: WHR – Waist-to-Hip Ratio

Fig 1: Mean and SD of WHR

The Fig 1 shows the Mean value of WHR of among the different Universities were Tripura University 0.82 ± 0.04 , Nagaland Univ 0.88 ± 0.07 , NEHU 0.86 ± 0.07 , Manipur Univ 0.83 ± 0.04 , Mizoram Univ 0.85 ± 0.10 and Assam Univ 0.89 ± 0.15 . The mean values were indicated that the

health risk factors of different college students were Low, because those values are lower than 0.90 which was set by WHO.

Table 1 shows the ANOVA of the six different groups.

Table 1: Difference of WHR between six Universities footballers (ANOVA)

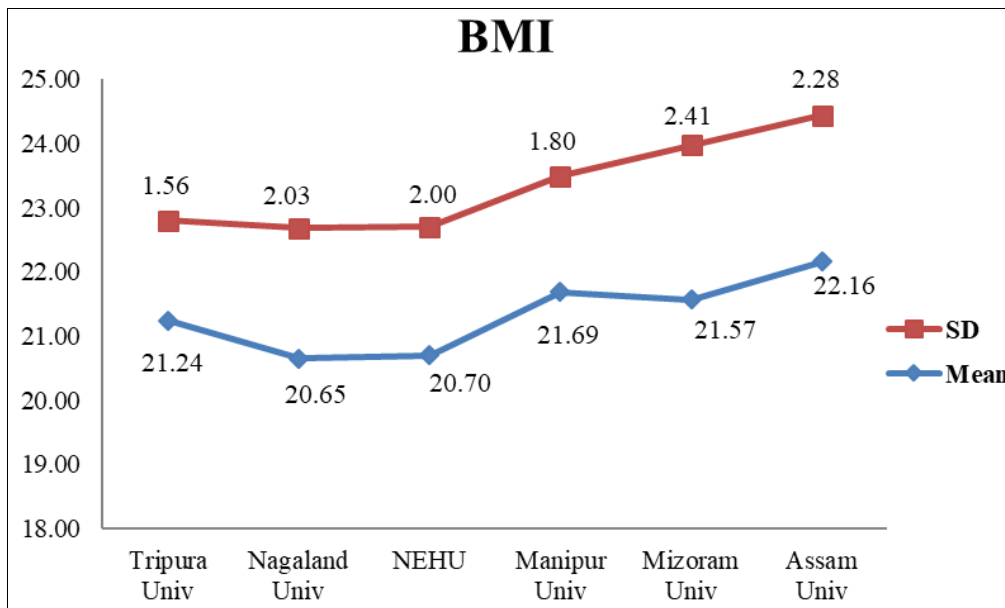
Source of Variation	SS	df	MS	F
Between Groups	0.07	5	0.01	1.77
Within Groups	0.76	96	0.01	
Total	0.83	101		

SS- Some of Square, df- Degree of Freedom, MS- Mean Square, F- 'F' ratio.

Table-1 reveals that F-ratio of WHR was 1.77, smaller than the critical value. So we can say that there was no significant difference among six groups. Nela Raseta *et al.* conducted a study on Interrelations between body mass index, percentage of body fat, and waist-to-hip ratio among different groups of

students at the University of Banja Luka. In this study they did not found any significant difference.

Figure 2 showed the pertaining to BMI were subjected to descriptive analysis of Mean, Standard deviation and ANOVA technique for analysis had been presented below.



Source: Primary data collected by the researcher, October 2018 Legend: BMI – Body Mass Index

Fig 2: Mean and SD of BMI

The Fig. 2 shows the Mean values of BMI of among the different colleges were Tripura Univ 21.24 ± 1.56 , Nagaland Univ 20.65 ± 2.03 , NEHU 20.70 ± 2.00 , Manipur Univ 21.69 ± 1.80 , Mizoram Univ 21.57 ± 2.41 and Assam Univ

22.16 ± 2.28 . According to the normal range of BMI lying between 18.50-24.99. Considering the mean value of those six Universities, were in normal BMI level.

Table 2 shows the ANOVA of the six groups.

Table 2: Difference of BMI between Six Universities footballers (ANOVA)

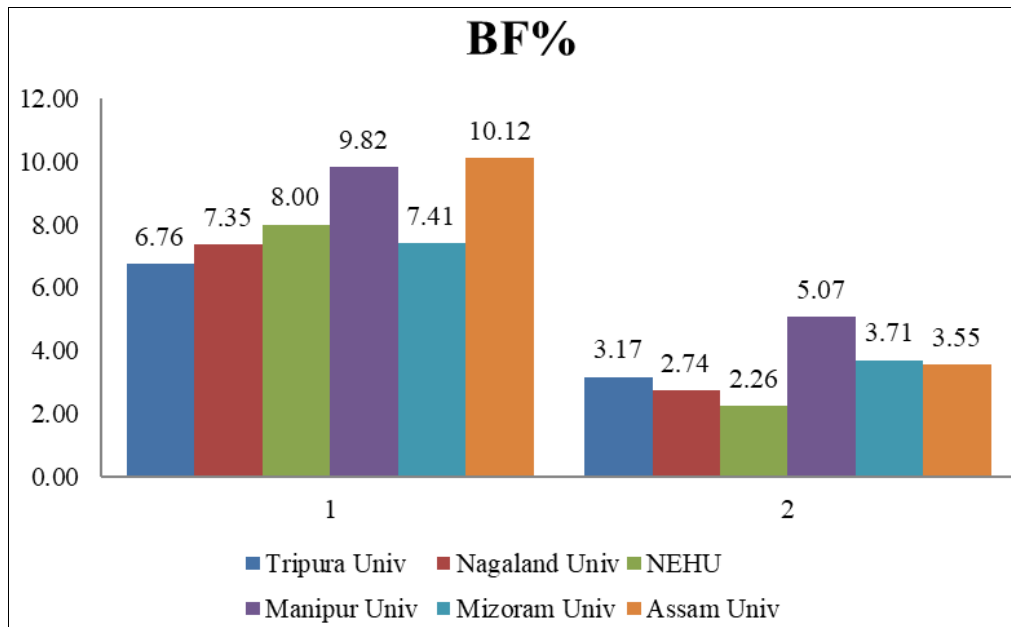
Source of Variation	SS	df	MS	F
Between Groups	29.53	5	5.91	1.43
Within Groups	396.95	96	4.13	
Total	426.48	101		

SS- Some of Square, df- Degree of Freedom, MS- Mean Square, F- 'F' ratio.

Table- 2 reveals that F-ratio of BMI was 1.43, less than the critical value. So on the basis of Body Mass Index, there was no statistical significance among the footballers of six difference Universities of North-east. Blodin *et al.*, 2016 ^[4] conducted a study on Cross-sectional associations between empirically-derived dietary patterns and indicators of disease

risk among university students. The findings of the study was support this study by no significant difference among the University level football players of North-east.

Figure 3 pertaining to BF% were subjected to descriptive analysis of Mean, Standard deviation and ANOVA technique for analysis had been presented below.



Source: Primary data collected by the researcher, October 2018 Legend: BF% – Body Fat Percentage

Fig 3: Mean and SD of BF%

The Fig. 3 shows the Mean values of BF% of among the different states were Tripura Univ 6.76±3.17, Nagaland Univ 7.35±2.74, NEHU 8.00±2.26, Manipur Univ 9.82±5.07, Mizoram Univ 7.41±3.71, and Assam Univ 10.12±3.55. According to American Council on Exercise, having 6-13% of body fat fall in athletic. On the basis of the result, all six states footballers were in good position considered the status of Body Fat Percentage. (ACE Fit 2017).

Table 3 shows the one way ANOVA of the six groups.

Table 3: Difference of BF% between Six University Footballers (One way ANOVA)

Source of Variation	SS	df	MS	F
Between Groups	165.58	5	33.12	2.66
Within Groups	1195.29	96	12.45	
Total	1360.87	101		

SS- Some of Square, df- Degree of Freedom, MS- Mean Square, F- 'F' ratio.

Table- 3 reveals that F-ratio of BF% was 2.55 which are smaller than the critical value. So on the basis of Body Fat percentage, there was no statistical significance among the footballers of six different states of North-east. Crombie *et al.*, 2012 [6] conducted a study on Weight and body-composition change during the college freshman year in male general-population students and army Reserve Officer Training Corps (ROTC) cadets. In the study the researcher found there was no significant difference among the group. So the findings of this study were in line with many others "Crombie *et al.*, 2012 [6]; Girz *et al.*, 2013 [11]; Gunes *et al.*, 2012 [10]" which are supported this study.

Findings of the study

Considering the limitations of the study with some other related factor like food habit or daily routine, the study conclude that there was no such difference according to their Waist- hip ratio, Body Mass Index and Body Fat Percentage among the University football players of six difference states of North-eastern region of India. The obtaining result urges us the WHR or heart risk factor was in normal level i.e. below from .90 (Standard level). Moreover all the groups of footballers were having Normal BMI level (18.50-24.99) and

all were having good athletic body fat percentage (6-13%).

Conclusion

On the basis of the discussion above following conclusion may be drawn:

1. In WHR, the heart risk of University level male football players of North-east were in same.
2. In BMI, there was no difference among University level male football players of North-east.
3. In BF%, there was also no difference among University level male football players of North-east.

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