

# COMPARATIVE ASSESSMENT ON BMI AND BODY COMPOSITION BETWEEN LONG JUMPERS AND SPRIINTERS

Dr. Limon Kumar Saha<sup>1</sup> and Dr. Manoj Kumar Murmu<sup>2</sup>

<sup>1</sup>Assistant Professor in Physical education, Post Graduate Govt. Institute For Physical Education, Banipur, 24 Pgs(n), W.B., e-mail : [limonmisti@gmail.com](mailto:limonmisti@gmail.com)

<sup>2</sup>Assistant Professor in Physical education, Post Graduate Govt. Institute For Physical Education, Banipur, 24 Pgs(n), W.B., e-mail : [divinesports21@gmail.com](mailto:divinesports21@gmail.com)

## ABSTRACT

The purpose of the study was to compare of BMI and body composition between sprinters and long jumpers. The subjects were taken from North 24<sup>th</sup> Parganas and Nadia of west Bengal. 30 sprinters and 30 long jumpers were randomly selected for this present study. Only the female athletes were selected whose age ranged from 14 to 16 years. Height and weight of the respondents were collected by the researcher for the measurement of BMI and Jackson and Pollock 4 sites skinfold measurement technique was used to measure the percentage of body fat. For statistical analysis, 't' test was used and the level significance was set at 0.05 level. In results, it was found that there was significant difference in BMI and percentage of body fat between sprinters and long jumpers

**Key Words :** Body Mass Index (BMI), Percentage of Body Fat, Sprinters, Long Jumpers

## Introduction

Physical Education is one of the emerging disciplines in the present area in every corner of the world; in India too it's showing a spurt. A child starts its physical activity right inside its mother womb. It's a natural instinct of each and every child to be attracted towards games and sports. Now this is the turn of physical education professionals to do the right thing in right way.

Track and field is a sport which includes athletic contests established on the skills of running, jumping, and throwing. The name is derived from the sport's typical venue: a stadium with an oval running track enclosing a grass field where the throwing and some of the jumping events take place. Track and field is categorized under the umbrella sport of athletics, which also includes road running, cross country running, and race walking.

The long jump (historically called the board jump) is a field event in which athletes require speed, explosive leg strength flexibility and agility in an attempt to leap as far as possible from a take-off point. Whereas sprint event is a track event in which athletes require speed and explosive leg strength. Both are mostly similar but their physical structure may demand some specific gesture according to their nature of activity.

Body mass index (BMI) provided a simple numeric measure of a person's "fitness" or "thinness", allowing health professionals to discuss over and under-weight problems more objectively with their patients. However, BMI has become controversial because many people, including physicians, have come to rely on its apparent numerical authority for medical diagnosis ,but that was never the BMI's purpose; it is meant to be used as a simple means of classifying sedentary (physically inactive) individuals with an average body composition . For these individuals, the current value settings are as follows ; a BMI of 18.5 to 25 may indicate optimal weight ; a BMI lower than 18.5 suggests the person is underweight while a number above 25 may indicate the person is overweight ;a BMI below 17.5 may indicate the person has anorexia nervosa or a related disorder ;a number above 30 suggests the person is obese (over 40,morbidly obese).(WHO, 2002)

The human body is made up of many different substances which are necessary for various body functions. These include water, muscle, bone, organs and fat. But while fat is an essential part of the human body, necessary to provide energy for long duration athletic endeavours, as well as insulation against cold temperatures and the protection of vital organs, it is often portrayed as an undesirable element that must be eliminated at all costs. In physical fitness, body composition is used to describe the percentages of fat, bone and muscle in human bodies.

### Methodology

The objective of the study was to compare of BMI and body composition between sprinters and long jumpers. For this study 60 (sixty) Athletes out of which 30 female sprinters (100mt, 200mt and 400mt. event) and long jumpers were selected randomly from different clubs of north 24 Parganas and Nadia district of West Bengal. Double group design was followed for this investigation. The variables of this study were selected as BMI and percentage of body fat. Age of the subjects was ranged from 14 to 16 years. To analysis the data statistically 't' test was employed and level of significance was set at 0.05 level.

**Criterion Measures :** The tests were conducted to measure the selected variables of the present study were as follows :

Variables	Tools and technique	Unit
BMI	Weight(kg) / height(m) <sup>2</sup>	Kg/m <sup>2</sup>
Percentage of body fat	Jackson and Pollock 4 sites skinfold measurement (abdominal ,suprailiac, triceps, and thigh)	In %

## Results of the Study

**Table-1**

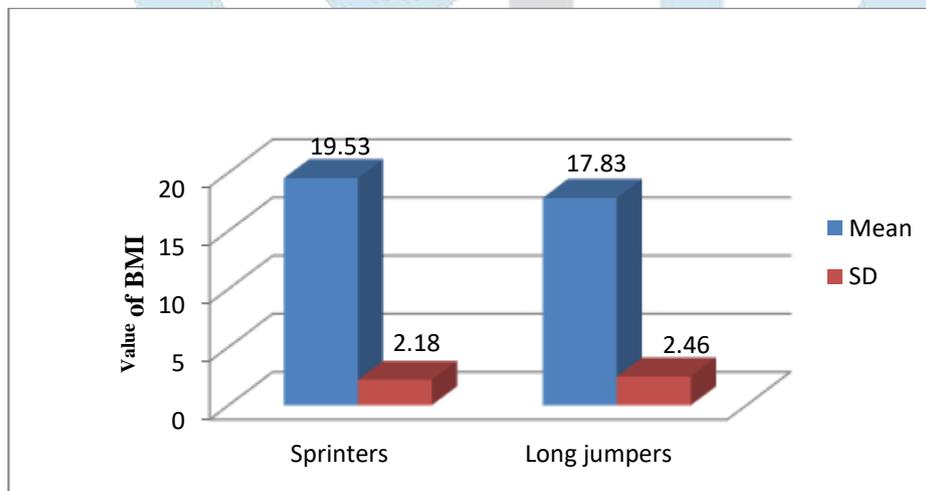
**Descriptive Statistics and “t” Ratio Regarding BMI of Sprinters and Long Jumpers.**

Variables	Sprinter		Long jumper		t –Ratio
	MEAN	SD	MEAN	SD	
BMI (Kg/m <sup>2</sup> )	19.53	±2.18	17.83	±2.46	2.83*

Significant at 0.05 level of confidence  $t_{0.05(58)} = 2.00$

\*- Significant difference

From the above table it clearly shows that the mean and standard deviation of BMI of sprinter and long jumpers were  $19.53 \pm 2.18$  and  $17.83 \pm 2.46$  respectively. It was also evident that the calculated “t” value (2.83) was greater than the tabulated “t” value of 2.00. So it may be concluded that BMI was found to be significantly different between sprinters and long jumpers at 0.05 level of confidence. As the mean value of sprinter (19.53) showed higher than the mean value of long jumpers (17.83), we can conclude that sprinters were higher in BMI than long jumpers.



**Fig 1: Graphical Presentation of Descriptive Statistics Regarding BMI of Sprinters and Long Jumpers.**

**Table-2**

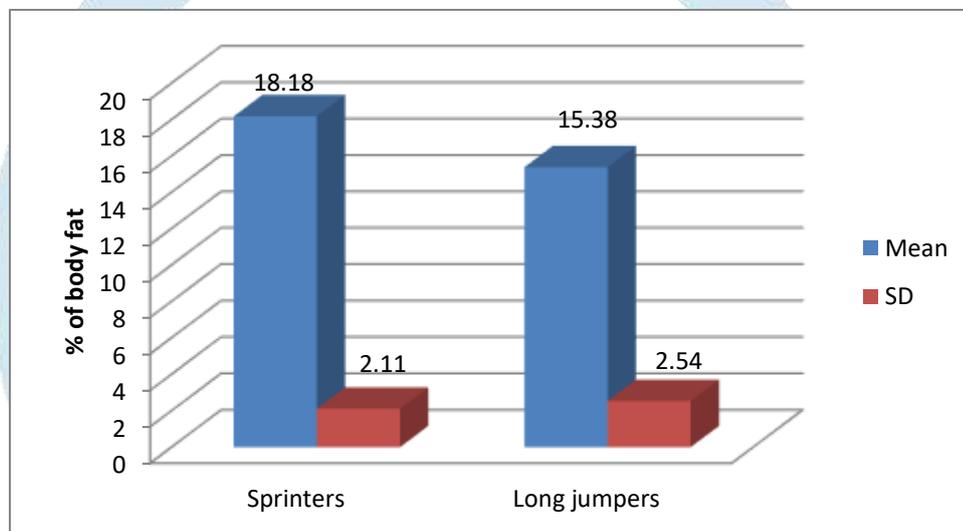
**Descriptive Statistics and “t” Ratio Regarding Percentage of Body Fat of Sprinters and Long Jumpers.**

Variables	Sprinter		Long jumper		t –Ratio
	MEAN	SD	MEAN	SD	
Percentage of body fat	18.18	±2.11	15.38	±2.54	4.66*

Significant at 0.05 level of confidence  $t_{0.05(df-2,58)} = 2.00$

\*- significant difference

From the above table it reveals that the mean and standard deviation of sprinters and long jumpers were  $18.18 \pm 2.11$  and  $15.38 \pm 2.54$  respectively. It was also evident that the calculated “t” value (4.66) was greater than the tabulated “t” value of 2.00. So it may be said that the percentage of body fat was found to be significantly different between sprinters and long jumpers at 0.05 level of confidence. As the mean value of sprinter (18.18) showed higher than the mean value of long jumpers (15.38), we can conclude that sprinters were higher in body fat percentage than long jumpers.



**Fig 2: Graphical Presentation of Descriptive Statistics Regarding Percentage of body fat of Sprinters and Long Jumpers.**

### Discussion on Findings

Considering the result of the present study, the discussion on findings may be attributed as follows.

In the present study BMI of sprinters and long jumpers was found significantly differ from each other and BMI of sprinters were indicated higher than the long jumpers. Similar result was also observed by **Metz and Das** (2018).

Considering since both activity i.e, sprint and long jump both are anaerobic in nature, though their training schedules are different and pattern of activity are also different. As a reason, one is running event whereas another one is jumping event. Due to their different training schedule, somewhat though their diet chart is different. This could be the reason that BMI of sprinters and long jumpers differ from each other. Another strong reason of such result may be the requirement of specific physique structure for better performance in these two different event.

In respect of percentage of body, was found significant difference between sprinters and long jumpers and percentage of body fat of sprinters were indicated higher than the long jumpers. Similar result was observed by **Kaur and Singh Deol** (2018), **Asfaw and Pallavi** (2018), **Šolaja et al.** (2017).

The present study showed that sprinters possessed higher fat percentage rather than long jumpers. In previous discussion we found that BMI of sprinters were also higher and the reason may be diet as it

dominates to increase fat mass of sprinters than the long jumpers. In contrast, lesser fat percentage of long jumpers indicating higher lean body mass as they needed for their activity and lower fat mass.

### Conclusions

In the present study, considering the findings, the following specific conclusions have been drawn by the researcher.

1. Significant difference was found between sprinters and long jumpers in respect of BMI.
2. Significant difference was found between sprinters and long jumpers in respect of percentage of body fat.

### References

- Asfaw, A.M. and A, P.(2018).** “ A comparative analysis of selected anthropometric variables and somatotyping components of Ethiopian female jumpers”. International Journal of Applied Research 4(2): 195-200. ISSN Print: 2394-7500 ISSN Online: 2394-5869 [www.allresearchjournal.com](http://www.allresearchjournal.com)
- Banerjee, A. (2015).** “Comparative Study of Selected Physiological and Body Composition Variables of Runners Jumpers and Throwers”. International Journal of Research in Pharmacy and Biosciences Volume 2, Issue 3, PP 1-4 ISSN 2394-5885 & ISSN 2394-5893 .
- Basavaraj Vastrad** –“Methodology of research in physical education and sport science” New Delhi-110052.
- Clarke David H, Clarke H. Harrison,** “Research Processes in Physical Education”, 2<sup>nd</sup> ed. Englewood Cliffs, Prentice Hall INC., 1970
- Dar, M.U.H. and Wani, M..M. (2017).**”Comparative study of selected physiological and psychological variables among vegetarian and nonvegetarian runners”.International Journal of Physiology, Nutrition and Physical Education 2017; 2(2): 59-62
- Kansal D.K-**Text Book of “ Applied Measurement Evaluation and Sports Selection”. New Delhi: Sports& Spiritual Science Publication, 2nd ed, 2008
- Kaur, J., & Deol, N. S. (2018).** Comparison of quality of life among master’s athlete and sedentary people.
- Mete, T. and Das, A. (2018).** “ A comparison on selected motor fitness components & physiological characteristics between sprinters & jumpers” International Journal of Yogic, 3(2): 148-151 ISSN:2456-4419 [www.theyogicjournal.com](http://www.theyogicjournal.com)
- Singh Ajmer et al.** “Essential of physical education”, pub Kalyani publisher, New Delhi,(2012)
- Solaja,A., Milankov, A., Pejakovic, s. and Stokic, E.(2017).**” Body composition of the Serbian national track and field team”. Medicinski pregled, 70(3-4), 87-94.
- Verma . J.P** –“A Text Book on Sport Statistics”. New Delhi: Sports Publication, 2009.
- Yadav, K.R .(2015).** “A comparative study of body composition between sprinters and throwers”. Internat. J. Phy. Edu., 8 (1) : 20-23. ISSN-0976-7924 :[www.researchjournal.co.in](http://www.researchjournal.co.in)