IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A Study On Body Composition Of Women Cricketers

[1]Sandeep Gupta, [2]Shraddha Dwivedi

[1]Research Scholar, [2]Assistant Professor

[1,2]Department of Physical Education,

[1]Guru Ghasidas Vishwavidyalaya, Bilaspur C.G

[2]Degree college of physical Education, Amravati, Maharashtra, (India)

Abstract: Body composition plays a crucial role in the performance, health, and fitness of athletes, including cricketers. This study aimed to examine and compare the body composition of national-level women cricketers, specifically focusing on the differences between women batsmen and bowlers. A total of 40 participants, consisting of 20 batsmen and 20 bowlers from the Madhya Pradesh Cricket Academy, were assessed using the 7-site skinfold measurement technique to determine body fat percentage (BF%) and lean body mass (LBM). The findings revealed a statistically significant difference in BF%, with batsmen exhibiting higher body fat percentages than bowlers ($t = 2.862$, $p = 0.007$). However, no significant difference was found in LBM between the two groups ($t = 0.549$, $p = 0.587$). These results suggest that the distinct physical demands of batting and bowling influence body fat composition, with bowlers requiring lower body fat for explosive strength and power, while batters maintain slightly higher body fat levels due to endurance and agility needs. The study highlights the importance of role-specific training and nutrition strategies tailored to optimize body composition and performance for both batsmen and bowlers. Further research with a larger sample size and more detailed performance metrics is needed to deepen the understanding of body composition's role in female cricket performance.

Index Terms **–** Body composition, lean body mass (LBM), skinfold.

INTRODUCTION

Body composition plays a crucial role in determining the overall performance, fitness, and health of athletes. For cricketers, particularly women, understanding the nuances of body composition is essential to optimizing their physical capabilities, injury prevention, and improving game performance. In the realm of sports science, body composition refers to the proportion of fat, muscle, bone, and water in the human body, and it significantly impacts an athlete's endurance, strength, and agility on the field. Body composition refers to the relative proportion of fat mass and lean mass (muscle, bone, and other tissues) in the body. For athletes, particularly cricketers, the balance between fat and lean tissue is critical for maintaining optimal performance. In cricket, the physical demands placed on players vary significantly depending on their roles, with batsmen and bowlers experiencing different physiological stresses. Despite the growing participation of women in cricket at various levels, research focusing specifically on the body composition of female cricketers remains limited. This study aims to fill that gap by exploring the key aspects of body composition in women cricketers, examining how it relates to their athletic performance, physical fitness, and overall health. By investigating factors such as body fat percentage, muscle mass, and distribution of lean tissue, this research seeks to provide valuable insights that could aid in designing more effective training programs and nutrition plans tailored to the unique needs of female cricketers. Batsmen typically require agility, endurance, and hand-eye coordination, whereas bowlers rely on strength, stamina, and explosive power to deliver high-speed deliveries. These differing requirements may lead to variations in body composition between the two groups. While there

is substantial research on male cricketers' body composition, limited studies focus on female cricketers, particularly at the national level.

Purpose of the study

The study aims to bridge the gap by comparing the body composition of 20 national-level women batsmen and 20 bowlers using the 7-site skinfold measurement technique also to identify trends and differences in fat distribution and lean tissue in both groups.

Population and Sample

The study sample consists of 40 national-level women cricketers purposively selected and divided into two groups:

- 20 batsmen
- 20 bowlers

All participants were selected from Madhya Pradesh Cricket academy (MPCA) the national women's cricket player's camp. The women cricketers were national players of cricket. Participants were aged between 18 and 28 years, and had at least 3 years of competitive experience in national-level cricket.

Test administration

The 7-site skinfold measurement technique, which is widely used to assess body fat percentage, was employed for this study. The seven sites measured include triceps, biceps, subscapular, Suprailiac, Abdomen, Thigh, Calf (3). Skinfold measurements were taken by a trained and certified sports nutritionist and anthropometrist using calibrated skinfold calipers. The measurements were repeated three times at each site, and the average value was used for analysis. Barreira (2013) discovered that the seven-site skinfold method with calipers is the most common method of body composition assessment (2). It is that a seven-site analysis provides a more accurate representation of overall body composition compared to the three-site because it incorporates subcutaneous adipose tissue values from more locations than the three-site estimation. The Jackson-Pollock (seven-site) equations were utilized to calculate body density, which was then used to determine the overall body fat percentage (BF%). All measurements were performed by a single trained researcher to maintain consistency and ensure high intrarater reliability. Following the manufacturer's guidelines, all measurements were conducted on the right side of the body. For each site, three readings were recorded before moving on to the next anatomical location.

Statistical analysis

The data was analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics were computed to determine the mean and standard deviation of skinfold measurements for each group. Independent t-tests were conducted to compare the differences in body fat percentage and lean mass between the batsmen and bowlers.

Result and Discussion

Table 1: Descriptive statistics of women batters

	N	Min	Max	Mean	Std. Dev	Skewness	Kurtosis
Age	20	18.00	29.00	24.4500	2.85574	-.643	.383
Weight	20	44.00	58.00	51.8500	4.30758	-.351	-.932
BF	20	17.00	27.00	21.8000	2.39737	.007	.426
LBM	20	33.75	45.92	40.6740	3.88967	-.110	-1.376

Table 2: Descriptive statistics of women bowlers

	N	Min	Max	Mean	Std. Dev	Skewness	Kurtosis
Age (years)	20	18.00	29.00	23.6500	3.1334	.064	-.875
Weight (Kg)	20	43.00	57.00	49.7000	4.6002	.272	-1.150
BF	20	14.00	24.00	19.4500	2.7104	-.406	-.713
LBM (Kg)	20	33.97	47.04	40.0140	3.1770	.078	-.822

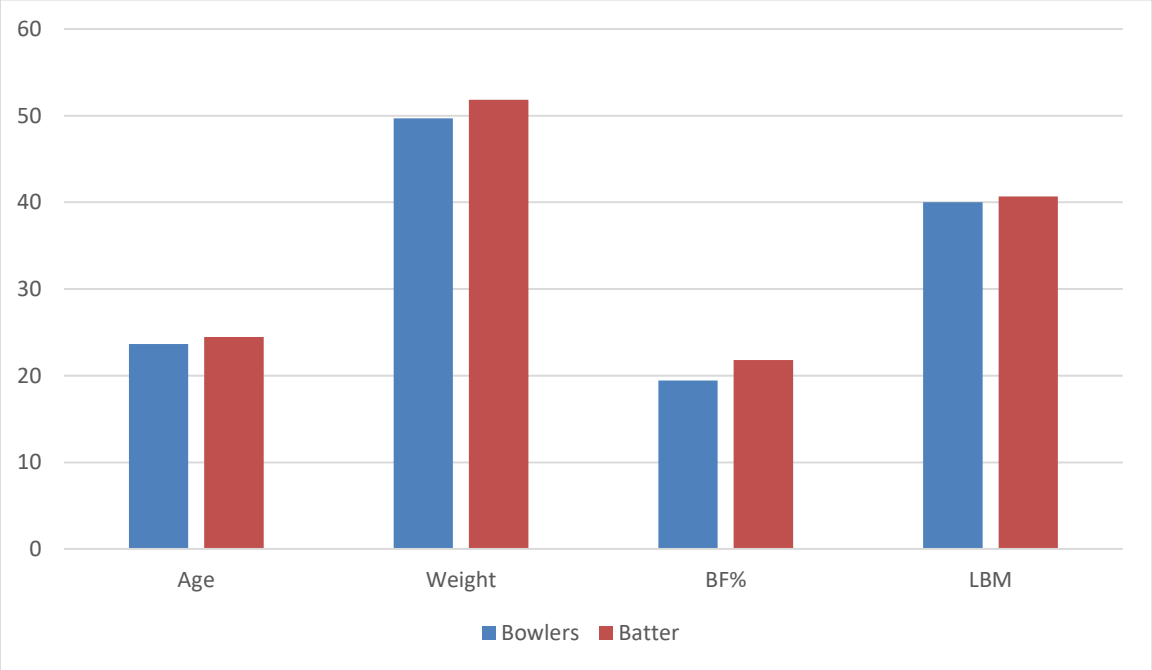

Table 3: Comparison of body fat % (BF) and lean body mass (LBM) in between betters and bowlers.

Variables	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
BF%	2.862*	38	.007	2.35000	.68793	4.01207
LBM	.549	38	.587	.66000	-1.77563	3.09563

*Significant difference at 0.05 level of significance.

The data provided in this table reflects the results of a statistical comparison between the body composition characteristics of national-level women batters and women bowlers, focusing on two key variables: body fat percentage (BF%) and lean body mass (LBM). The comparison is conducted using independent sample t-tests to determine if significant differences exist between these two groups.

Discussion

Body Fat Percentage (BF%)

The results for body fat percentage reveal a statistically significant difference between women batters and women bowlers ($t = 2.862$, $p = 0.007$). The mean difference between the two groups is 2.35%, with the confidence interval for the difference ranging from 0.69% to 4.01%. This suggests that, on average, women batters have a higher body fat percentage compared to women bowlers. This finding is consistent with the distinct physical demands of batting and bowling in cricket. Batting typically requires less explosive strength and more endurance and agility, which may allow for a slightly higher body fat percentage. In contrast, bowling demands greater upper and lower body strength and explosive power, which often correlates with lower body fat percentages and higher muscle mass (Bishop et al., 2008). The lower body fat in bowlers may support their need for power and speed while delivering the ball and maintaining stamina over long periods.

It is important to note that while body fat plays a role in performance, having a moderate amount of body fat is essential for female athletes, as extreme leanness can negatively affect hormone levels, immune function, and overall health (Kreher & Schwartz, 2012). Therefore, the difference observed here is not necessarily indicative of an unhealthy body fat percentage in batters but highlights the physiological differences between the roles.

Lean Body Mass (LBM)

In contrast to body fat percentage, the comparison of lean body mass (LBM) between batters and bowlers reveals no significant difference ($t = 0.549$, $p = 0.587$). The mean difference of 0.66 kg, with a 95% confidence interval ranging from -1.78 kg to 3.10 kg, indicates that the two groups have similar levels of lean mass. This result is not statistically significant, suggesting that the lean mass of women batters and women bowlers is comparable. While the difference in body fat percentage between the two groups is notable, the absence of significant variation in LBM could reflect the fact that both batting and bowling require substantial muscle mass for different reasons. Batters rely on muscle strength for powerful stroke play and maintaining endurance, while bowlers require significant lean mass for power, speed, and stability during their bowling action. Therefore, both groups may have similarly developed lean muscle mass due to the diverse physical demands of the sport. Additionally, it is possible that training regimens for both batters and bowlers are tailored to enhance overall muscle development and strength, leading to similar levels of LBM across both groups (Bishop et al., 2008). However, further research incorporating more detailed training history and specific performance measures is needed to fully understand the relationship between lean mass and role-specific performance in female cricketers.

Conclusion

The results of this comparison indicate a significant difference in body fat percentage between women batters and bowlers, with batters exhibiting higher body fat levels. This finding aligns with the distinct physical demands of the two cricket roles. On the other hand, no significant differences in lean body mass were observed between the two groups, suggesting that both batters and bowlers possess similar levels of muscle mass to support their respective roles. These findings emphasize the need for role-specific training and nutrition strategies that can optimize body composition for both batting and bowling. Further research that includes a larger sample size, detailed training variables, and performance metrics will be crucial to better understand how body composition directly influences cricket performance in female athletes.

REFERENCES

1. Barreira TV, Renfrow MS, Tseh W, Kang M. The validation of 7-site skinfold measurements taken by exercise science students. Int J Exerc Sci. 2013;6(1):20–28.
2. Baranauskas MN, Johnson KE, Juvancic-Heltzel JA, Kappler RM, Richardson L, Jamieson S, Otterstetter R. Seven-site versus three-site method of body composition using BodyMetrix™ ultrasound compared to dual-energy X-ray absorptiometry. Clin Physiol Funct Imaging. 2015;37(3):317–321. doi: 10.1111/cpf.12307.
3. Wagner DR. Ultrasound as a Tool to Assess Body Fat. J Obes (280713) 2013:1–9. doi: 10.1155/2013/280713
4. Bishop, D., Jones, E., & Woods, D. R. (2008). Recovery from training: A brief review. Journal of Strength and Conditioning Research, 22(3), 1135–1154.
5. Kreher, J. B., & Schwartz, J. B. (2012). Overtraining syndrome: A practical guide. Sports Health, 4(2), 128–138.