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A Comparative Study: Analysis of Anthropometric Variables Between Spin and Fast Bowlers Among Under-20 Male Cricketers From Lucknow Sports Stadium

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Abstract
The aim of this study was to compare the body measurements of spin and fast bowlers in cricket from Lucknow. The study included 40 cricket players under 20. who participated in Minimum District level. The measurements taken for this study were height, arm length, leg length, thigh girth, and body composition (measured using biceps, triceps, subscapular, and suprailiac skinfolds). A t-test was used to determine significant differences, with a significance level set at 0.05.
The results showed a significant difference between spin and fast bowlers in height (2.635), arm length (3.739), leg length (4.024), and body composition (2.285). However, there was no significant difference in thigh girth (1.603), as the calculated t-value (1.603) was lower than the tabulated t-value (2.021).
Keywords: Body measurements, body composition, cricket players, Lucknow Sports stadium.

INTRODUCTION

Cricket is a popular sport in India that unites people in a special way. In the early days, cricket was mainly seen as a contest between batting and bowling, and physical fitness or body type was not considered very important. However, with the introduction of One Day Cricket, the game has changed significantly, placing greater physical demands on players depending on the format and their role in the team (Simpson, Bob, 1996).
In competitive sports, structure (body build) and function (performance ability) are closely linked. When factors like body measurements, body shape, fitness, psychology, and motor skills are the same among athletes, body structure plays a key role in determining an elite athlete's success (Nadgir, Anand, 1986).

Anthropometry in Cricket

Anthropometry is the study of human body measurements, focusing on bone structure, muscles, and fat tissue. Many factors contribute to an athlete's performance, and body structure, including size, shape, and composition, plays an important role. Today, athletes are often selected based on their physical build and body size to ensure better performance in sports. Anthropometric measurements involve recording body dimensions such as height, weight, width, depth, and circumference of different body parts. Some of the most common measurements used to assess a person's nutritional status include height, body weight, mid-arm circumference, and triceps skinfold thickness (Blackburn et al., 1977). Every human being has a unique body structure, and there are noticeable differences in physical appearance. Scientists have been intrigued by how athletes from different sports have distinct body types, leading to research on classifying and analyzing these variations. Athletes show a wide range of differences in their body shape and genetic makeup.

Purpose of the Study

The main goal of this study was to examine the body measurements that differentiate spin bowlers from fast bowlers in Lucknow who actively participate in district tournaments. Since anthropometry

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is a broad field, a specific hypothesis was developed to focus on certain body measurements.

- The study aimed to identify which anthropometric factors play the biggest role in distinguishing spin bowlers from fast bowlers among cricketers at Lucknow Sports Stadium who have competed at the district level.

Methodology - Subjects

This study included 40 district-level cricket players who represented the district Level. The participants were divided into two groups: 20 spin bowlers and 20 fast bowlers. Their ages ranged Under 20.

Necessary permissions were obtained from the coaches of the Lucknow sports stadium. All tests were conducted and recorded at the Lucknow stadium. Anthropometric and body composition measurements were taken during each testing session, and all measurements were recorded using the metric system.

Variables and Measurement Criteria

This study focused on specific body measurements. The upper and lower body parts were measured using an anthropometric kit.

Table 1: List of Measured Variables and Tools Used

The following table lists the body measurements taken in the study, along with the tools used and their measurement units.

Sr. No	Variables	Tools Used	Unit
01	Standing and sitting height	Stadiometer	CM
02	Arm length, leg length, and thigh girth	Gulick tape	CM
03	Body composition (biceps, triceps, subscapular, and suprailiac skinfold)	Skinfold caliper	MM

Research Design

This study used a static group design, where each group included 20 participants.

Statistical Procedure and Analysis

A descriptive analysis was conducted for all the measured variables, separately for spin bowlers and medium pace bowlers. To determine significant differences in anthropometric variables, a t-test was used. Basic statistical methods, such as calculating the mean and standard deviation (S.D.), were applied to understand differences in player characteristics.

The researcher analyzed the data using simple statistical techniques, including mean and S.D., to compare the body measurements of spin bowlers and fast bowlers. A t-test was used to check for significant differences between the two groups.

First, all spin and fast bowlers were grouped together based on their similar level of participation in district-level tournaments. The raw data was then organized into tables, and a detailed comparison of anthropometric measurements was made between the two groups. This section specifically discusses the differences in body measurements between spin and fast bowlers who have competed at the district level.

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Results

The calculated t-test value was compared with the standard value at a 0.05 confidence level, with 99 degrees of freedom. The average (mean) values and standard deviation (SD) of the anthropometric measurements were recorded and presented in the table below.

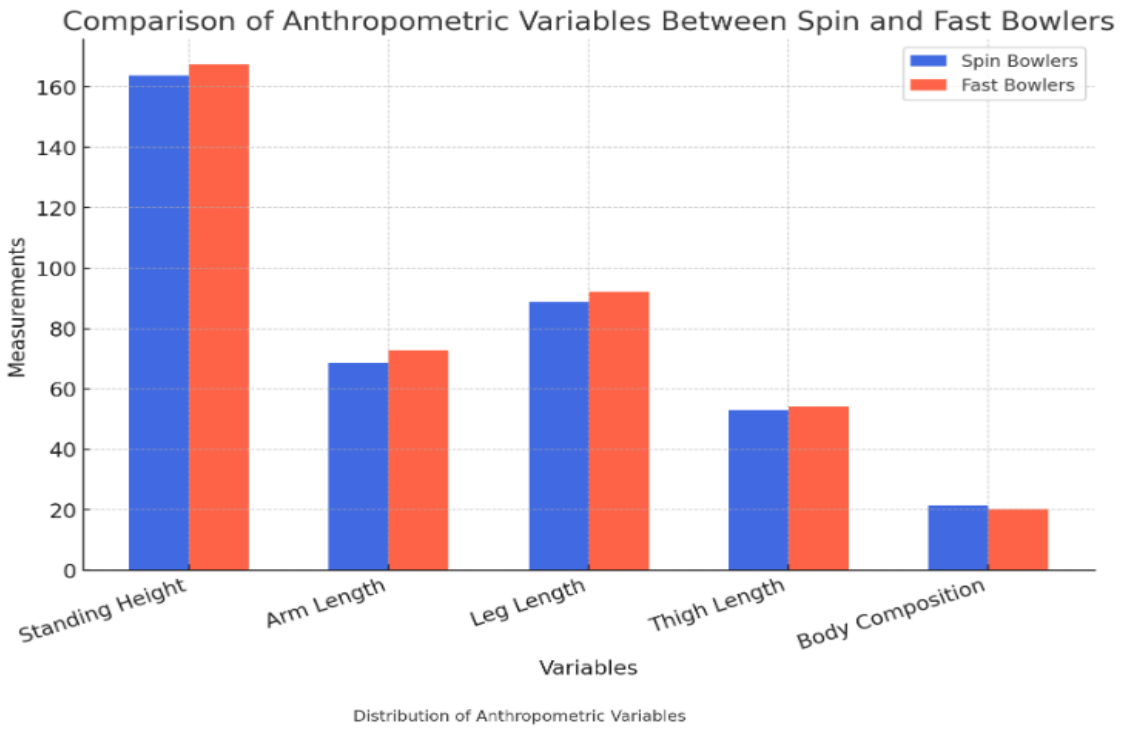
Table 2: Study Results – Mean, Standard Deviation (SD), and T-Score of Spin and Fast Bowlers

The table below presents the mean values, standard deviations (SD), and t-scores for various body measurements of spin and fast bowlers.

Sr. No	Variables	Spin Bowlers (Mean ± SD)	Fast Bowlers (Mean ± SD)	T-Score
01	Standing Height	163.81 ± 4.22	167.4 ± 4.3	2.635
02	Arm Length	68.81 ± 3.09	72.7 ± 3.5	3.739
03	Leg Length	88.81 ± 3.21	92.1 ± 3.2	4.024
04	Thigh Length	53.14 ± 2.09	54.2 ± 1.9	1.603
05	Body Composition	21.55 ± 2.04	20.3 ± 1.3	2.285

At 0.05 significance level, the tabulated t-value is 2.021.

Table 1 clearly shows that there is a significant difference between spin and fast bowlers in terms of standing height, arm length, leg length, and body composition. However, there is no significant difference in thigh girth between the two groups.



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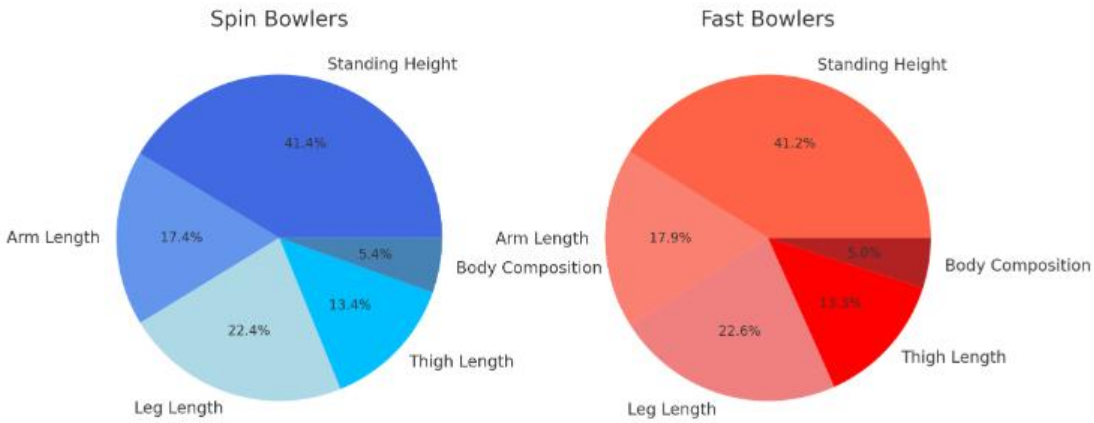

Here are the bar chart and pie charts representing the anthropometric differences between spin and fast bowlers. The bar chart compares each variable side by side, while the pie charts show the proportional distribution of measurements for both groups.

Discussion

1. The study found that there is a difference between spin and fast bowlers at the district Players. Many game-related skills and body measurements change as young athletes grow and develop.
2. Significant differences were observed in standing height, arm length, leg length, and body composition. These changes are likely due to natural physical development.
3. The study also found that there was no significant difference in thigh girth between spin and fast bowlers at the 0.05 significance level. This may be because players undergo similar levels of training.

Conclusion

The study results show that there is a significant difference between spin and fast bowlers in cricket based on certain body measurements. The key differences were found in standing height, arm length, leg length, and body composition, while no significant difference was observed in thigh girth at the 0.05 significance level.

- **Standing Height:** There is a significant difference between spin and fast bowlers.
- **Arm Length:** A significant difference was found between the two groups.
- **Leg Length:** The study showed a significant difference in leg length.
- **Thigh Girth:** No significant difference was observed between spin and fast bowlers.
- **Body Composition:** A significant difference was found in body composition between the two groups.

Recommendations for Future Research

Extensive research has been conducted in various sports to identify the physical characteristics of

young athletes, helping coaches recognize potential talent. However, there is limited research specifically on the anthropometric and other characteristics of young cricketers. Therefore, further studies are needed to analyze their physical, physiological, psychological, and morphological profiles.

- The sample size in this study was small. Future research should include a larger group of young cricketers for more accurate results.
- It is suggested to study the growth patterns of young cricketers using either a long-term (longitudinal), mixed, or cross-sectional research approach.
- Different cricket roles, such as batting, bowling, and wicketkeeping, require unique physical and mental attributes. Research should focus on the specific characteristics needed for each role.
- This study focused on district-level cricketers. Since national and international players may have different physical attributes due to higher levels of training, future studies should examine players at these levels.

Recommendations for Coaches and Administrators

- Training programs should be more challenging, or players should be selected based on suitable body types.
- Identifying young cricket talent early and providing proper coaching can help develop skilled players.
- Coaches should use their knowledge of body structure, fitness, and physical requirements to train players for different roles in cricket effectively.

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