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Analysis of anthropometric peculiarities among fast and spin bowlers in the cricket academy of Tamil Nadu cricket association

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Abstract
The purpose of the study was to find out the analysis an anthropometric peculiarities among fast and spin bowlers in the academies of Tamil Nadu Cricket Association. In order to achieve these purpose 30 YMCA cricket academy players were taken as subject from Chennai. The selected subjects were in the age group of 16 to 23 years. The subject (N=30) were randomly assigned to two equal groups of fifteen subjects each. The groups were assigned as Spin Bowler Group and Fast Bowler Group in an equivalent manner. All the thirty subjects were tested on their anthropometric variables name such as height, weight, arm girth relaxed, arm girth flexed, waist girth and calf girth. The difference in the mean of each group for selected variable was tested by independent 't' test SPSS software was used for analysis of the data. The level of significance was fixed at 0.05. Analysis of data revealed that the difference between spin bowler group and fast bowler group for arm girth relax, arm girth flexed and calf girth anthropometric are not significant. The data does indicated that the difference between spin bowler group and fast bowler group for anthropometric variables height, weight and waist girth are significant.

Keywords: Anthropometric, girth measurement, spin bowler, fast bowler, cricket players

Introduction
Cricket is one of the best and favorite games for everyone, from children to their grandparents. It has been the most entertaining game since long years back. Cricket can be played both socially and competitively, by males and females of all ages. While competitive Cricket is mostly played on a pitch on an oval field, Cricket just for fun can be played in backyards, parks, streets or on the beach. For millions of cricket fans it's their world, their home.

Fast Bowlers Characteristics
The common principles for good bowling are correct grip, smooth and economical run-up, well balanced delivery action making full use of height and body, fluent follow through action. The importance of bowling reflects on the results. The team that is not good in bowling will have a lesser chance of winning the match. The following are different types of bowling namely inswing, outswing, in cutter.

Fast bowlers, some times known as pace bowlers, is one of the two main approaches to bowlers in bowling the sport of cricket. Practitioners are usually known as fast bowlers fast men, pace bowlers, although some times the label refers to the specific fast bowling technique the bowler prefers, such as swing bowlers or seam bowler.

Fast bowling success is greatly influenced by the way the ball is delivered. Perhaps the main objective of the teacher or cricket coach should be to develop a 'good technique' in young fast bowlers. Thus, a thorough understanding of all the components of 'good technique' in the bowling action is necessary. Then, the underlining personal characteristics and flair of the young bowler, together with the proper mechanics of fast bowling, can be integrated to develop techniques which suit that particular individual. In this chapter, the bowling action is.

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divided into a number of different sections to dissect the mechanical features of fast bowling

Spin Bowlers Characteristics
Leg cutter, off spin, leg spin, googly, top spin, reverse swing, slower and chinaman. The main aim of spin bowling is to bowl the cricket ball with rapid rotation so that when it bounces on the pitch it will deviate from its normal straight path, thus making it difficult for the batsman to hit the ball cleanly. The speed the ball travels is not critical, and is significantly slower than that for fast bowling. A typical spin delivery has a speed in the range 70–90 km/h (45–55 mph).

Spin bowling is divided into four different categories, depending on the particular physical technique used. There is virtually no overlap between the two basic biomechanical techniques of wrist spin and finger spin. Off break –Right-handed with finger spin technique. Left arm orthodox spin – Left-handed with finger spin technique. Leg break – Right-handed with wrist spin technique. Left-arm unorthodox spin – Left-handed with wrist spin technique. Depending on technique, a spin bowler uses either predominant wrist or finger motion to impart spin to the ball around a horizontal axis that is at an oblique angle to the length of the pitch. This sort of spin means it is also possible for the Magnus effect to cause the ball to deviate sideways through the air, before it bounces. Such deviation is called drift. The combination of drift and spin can make the ball's trajectory complex, with a change of direction at the bounce. This variety of trajectories achievable by a spin bowler can bewilder inexperienced or poor batsmen.

Spin bowlers are generally given the task of bowling with an old, worn cricket ball. A new cricket ball better suits the techniques of fast bowling than spin bowling, while a worn one grips the pitch better and achieves greater spin. Spin bowlers are also more effective later in a game, as the pitch dries up and begins to crack and crumble. This again provides more purchase for the spinning ball and produces greater deviation.

Materials and methods

To achieve the purpose of the study fifteen fast bowlers and fifteen spin bowlers will be selected from YMCA cricket academy, Chennai weekly two days Saturday and Sunday. The age of the subjects ranged from 18 to 23 years. Anthropometric measurements (level 1) suggested by International society of the Advancement of Kinanthropometry (ISAK) were selected as variables.

Table 1: Selection of Variables and Selection of Test Items

Variables	Test		Unit Of Measurement
Anthropometric measurement	1	Weight	Kilogram
	2	Height	Centimeter
	3	Arm girth	Centimeter
	4	relaxed	Centimeter
	5	Arm girth	Centimeter
	6	flexed	Centimeter
	7	Waist girth	
	8	Calf girth	

Statistical analysis
Independent t-test data was used to assess the between group differences. The level of $p \leq 0.05$ was considered significant.

Table 2: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric VARIABLE Weight Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	62.06	±6.58	6.33	3.201*
Fast Bowler	55.73	±3.95		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-2 that mean value of spin bowler group and fast bowler group for weight was 62.06 and 55.73 respectively, whereas the standard deviation (SD) was ±6.58 and ±3.95. The critical value of 't' at 95% probability level is higher (6.33) than observed value of 't' (3.201). The data does indicated that the difference between spin bowler group and fast bowler group for weight are significant.

Table 3: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Height Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	1.566	±2.58	6.93	6.338
Fast Bowler	1.635	±3.35		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-3 that mean value of spin bowler group and fast bowler group for height was 1.566 and 1.635 respectively, whereas the standard deviation (SD) was ±2.58 and ±3.35. The critical value of 't' at 95% probability level is higher (6.93) than observed value of 't' (6.338). The data does indicated that the difference between spin bowler group and fast bowler group for height are significant.

Table 4: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Arm Girth Relax Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	27.16	±2.13	0.39	0.523
Fast Bowler	27.56	±1.97		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-4 that mean value of spin bowler group and fast bowler group for arm girth relax was 27.16 and 27.56 respectively, whereas the standard deviation (SD) was ±2.13 and ±1.97. The critical value of 't' at 95% probability level is higher (0.39) than observed value of 't' (0.523). The data does indicated that the difference between spin bowler group and fast bowler group for arm girth relax not significant.

Table 5: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast and Spin Bowlers on Their Anthropometric Variable Arm Girth Flexed Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	29.05	±2.34	0.42	0.552
Fast Bowler	29.47	±1.77		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-5 that mean value of spin bowler group and fast bowler group for arm girth flexed was 29.05 and 29.47 respectively, whereas the standard deviation (SD) was ±2.34 and ±1.77. The critical value of 't' at 95% probability level is higher (0.42) than observed value of 't' (0.552). The data does indicated that the difference between spin bowler group and fast bowler group for arm girth flexed not significant.

Table 6: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Waist Girth Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	74.62	±4.15	5.03	2.780*
Fast Bowler	79.65	±5.65		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-6 that mean value of spin bowler group and fast bowler group for waist girth was 74.62 and 79.65 respectively, whereas the standard deviation (SD) was ±4.15 and ±5.65. The critical value of 't' at 95% probability level is higher (5.03) than observed value of 't' (2.780*). The data does indicated that the difference between spin bowler group and fast bowler group for waist girth not significant.

Table 7: Significance of Difference between Mean Scores and Standard Deviations and Obtained 'T' Value of Fast And Spin Bowlers on Their Anthropometric Variable Calf Girth Presented In Table

Group	Mean	SD	Mean Difference	t-Value
Spin Bowler	35.28	±2.10	0.28	0.405
Fast Bowler	35.56	±1.55		

Significant at 0.05 level (28 degrees of freedom 2.048)

It is observed from the table-7 that mean value of spin bowler group and fast bowler group for calf girth was 35.28 and 35.56 respectively, whereas the standard deviation (SD) was ±2.10 and ±1.55. The critical value of 't' at 95% probability level is higher (0.28) than observed value of 't' (0.405). The data does indicated that the difference between spin bowler group and fast bowler group for calf girth not significant.

Conclusion
1. It was observed from the anthropometric variables finding that there was no significant different between the spin bowlers and fast bowlers on arm girth flexed, arm girth relaxed and calf girth.
2. It was observed from the anthropometric variable finding that, there was a significant different between spin bowlers and fast bowlers on height, weight and waist girth.

Recommendations
In this course of study the investigator faced several problems and therefore the following recommendations are made for further investigation.
1. Anthropometric measurements provide an important role in identification of sports talents.
2. Anthropometric peculiarities can be recommended for other sports and games.
3. Research may be conducted to see weather the longer periods of analysis was more effect.
4. This study may be conducted on subjects of different age

groups, sex and different sports and games.

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