



## RESEARCH ARTICLE

### BODY DIMENSION AMONG INDIAN UNIVERSITY WOMEN CRICKET BOWLERS

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#### ABSTRACT

The purpose of this investigation was to analyze of Anthropometric variables among Indian university women cricket bowlers. Fifty women university cricket bowlers were selected from ten universities (Annamalai University, Thiruvalluvar University, Pune University, Veer Narmod South Gujurut University, Rajasthan University, Andhra University, Kakatiya University, Pondicherry University, Kerala University and Mumbai University) participated in south west inter university women cricket tournament organized by Jiwaji university, Gwalior during the year 2009-2010. The age of the subject ranged from 18 to 25 years as per the eligibility form. Their anthropometric (Length) measurements were taken from Arm span length (ASL), Total arm length (TAL), Arm length (AL), Fore arm length (FAL), Hand length (HL), Total leg length (TLL), Thigh length (TL), Lower leg length (LLL), and Foot length (FL) using flexible steel tape to the nearest 0.2 mm. The data was analysed by using the Pearson's Product Moment Correlation. Results: positive Correlation on the body dimensions found among Indian – university women cricket bowlers on arm span length, total arm length, fore arm length, hand length, leg length, lower leg length, and foot length ( $p \leq .05$  &  $.01$ ) but upper arm length have no correlation with hand length, total leg length, thigh length and foot length. Conclusion: Anthropometric (length) measurements have strong correlation among the Indian university women cricket bowlers.

**Key words:** Anthropometric characteristics, Length measurements, university cricket bowlers.

#### INTRODUCTION

Cricket is a field-based sport, with each team consisting of 11 players. Although all are required to field and bat during a match, each player generally possesses a set of specific skills that defines their role and contributes to the overall performance of the team. One of these roles is fast bowling and a team will play between one and five fast bowlers in any given match. A combination of many factors determines success in fast bowling. One of these factors is the speed of the ball at release. A fast ball release speed reduces the time available for a batsman to perceive and use information about the delivery and execute an appropriate motor response. To attain high ball release speeds, the bowler's trunk must flex, extend, laterally flex, and rotate within a short period and the body must absorb ground reaction forces as high as six times body weight [1]. At the same time, the bowling arm circumducts through extension, abduction, external rotation, thrusting flexion, and internal rotation [2] at an angular velocity of approximately  $40.6 \text{ rad} \cdot \text{s}^{-1}$  [3]. Therefore, these unique demands may require specific physical traits that characterize elite players. Although some studies have incorporated a small selection of anthropometric measures as part of wider investigations into fast bowling technique [4, 5] the determinants of high ball release speeds [3] and the

development of injury [6, 7] few to date have reported a range of directly measured and derived variables [8, 9,10]. Modern cricket is an international sport and team sat all levels strive to develop fast bowlers who can generate high ball release speeds. The ability of bowlers to bowl with high ball release speeds contributes to the successful performance of cricket teams [5], by either dismissing or reducing the scoring ability of the opposing batsmen. There is agreement among researchers that fast bowling plays a crucial role in determining the success of any bowling side [11, 12, 13, 14, 15].

#### MATERIALS AND METHODS

##### Subject

For the study, purpose sampling method was used to selected the subjects. Fifty female cricket bowlers were selected from ten universities (Annamalai University n=5, Thiruvalluvar University n=5, Pune University n=5, Veer Narmod South Gujurut University n=5, Rajasthan University n=5, Andhra University n=5, Pondicherry University n=5, Kakatiya University n=5, Kerala University n=5, and Mumbai University n=5) who participated in south west inter university women cricket tournaments and the competition was organized in Jiwaji University, Gwalior, India during the academic year

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2009-2010 the age of the subject ranged from 18-25 years as per the eligibility form.

### Anthropometric measurements

Body Dimension (Length) characteristics, viz. Arm span length (ASL), Total arm length (TAL), Arm length (AL), Fore arm length (FAL), Hand length (HL), Total Leg length (TLL), Thigh length (TL), Lower leg length (LLL), and Foot length (FL) were measured by a flexible steel tape to the nearest 0.2 mm. All measurements were taken on the subject's dominant side.

### Data analysis

Descriptive statistics (mean  $\pm$  standard deviation) and Pearson's correlation coefficients were applied to establish the relationship among the variables measured for Indian university women cricket bowlers. The data were analysed by using SPSS (version 11.5) and the level of confidence was fixed at 0.05 to find out the statistical significance.

### RESULTS

Descriptive Statistics of body dimension among Indian university women cricket bowlers are shown in Table I. Correlation on the body dimensions were examined for Indian – university women cricket bowlers and presented in table II. Length measurements, viz. Arm span length, total arm length, fore arm length, hand length, leg length, lower leg length, and foot length, have positive correlations ( $p \leq .05$  &  $.01$ ) all the variables studied, but upper arm length have no correlation with hand length, total leg length, thigh length and foot length. However upper arm length have correlation with fore arm length and lower leg length and arm span also fails to have in significant correlation with hand length.

**Table 1. Descriptive Statistics of body dimension among Indian university women cricket bowlers**

Variables	Mean	S.D
Arm Span	161.57	7.83
Total arm	72.63	3.17
Upper Arm	31.39	2.95
Fore arm	23.66	1.8
Hand	18.58	1.65
Leg length	87.76	4.89
Thigh	41.83	3.75
Lower leg	45.92	1.88
foot	23.18	0.99

### DISCUSSION

Assuming the bowling arm is a quasi-rigid body and correct temporal sequencing and coordination of the bowling action is maintained, the length of the bowling arm should, in theory, influence ball release speed. This is because for any given angular velocity, the linear speed of a segment's endpoint is proportional to the length of its radius. In a sample of nine male fast-medium bowlers, Reported a high correlation between ball release speed and the length of the bowling arm [3]. Anthropometric dimensions and morphological characteristics play an important role in determining the success of a sportspersons [16, 17, 18]. The importance of passing, length arm has been stated by [19] as athletes and players who have longer arm might do well to use the better grip because it provides better control over the skill. Studies about the advantage of showing lengthy arm as “the longer the arm the greater the movement imparted to the object, thrown at the instant which left from the hand” [20]. The longer the power arm of the lever, the greater the amount of force, the shorten the power arm in relation to the length of the weight arm, the smaller is the movement of force, but the more immediate in action [21]. The advanced of having long arm as “if a player's or athlete arm and legs are long can use them effectively and can apply force through a longer arm and this have greater speed [22]. Basic anthropometric parameter helps in learning a skill. Observed that in cricket, certain anthropometric such as height, weight helps on executing some complex skills, such as a cricketer with at all suited for fast bowling. Cricketers with relatively long arm have certain advantage in fielding [23]. Anthropometric measurements of 20 male fast bowler's and shows arm length and shoulder width helps in release of the ball [24]. Due to largeness and length of hand and girth measurements make the fast bowler to ball more quickly. Anthropometric and physical fitness test on Negros and caucacians. He found significant longer arms, and hands biggest feet of Negros which make them better in sprinting ability and soft ball throw for distance compared to caucacians. South Africa group was more skill full in the test for passing and kicking distance. Both groups were equally matched in aspects such as stepping, dexterity and passing accuracy. The South Africa players were faster in sprinting activity and greater arm and leg length [24]. In the present study it was concluded that body dimension (length) plays a major role for women cricket bowlers to produce high speed, quick acceleration and have good accuracy.

### Recommendations

The sports training methodologist and cricket coaches will consider the anthropometric (length) measurements of the

**Table 2. Inter – correlation matrix of selected body dimension among Indian university women cricket**

Variables	ASL	TAL	UAL	FAL	HL	TLL	TL	LLL	FL
ASL	-	.442**	.225	.500**	.317	.631**	.601**	.441**	.646**
TAL		-	.828**	.751**	.518**	.355**	.163	.596**	.429**
UAL			-	.367**	.085	.135	-.058	.466**	.217
FAL				-	.385**	.376**	.285*	.409**	.338*
HL					-	.382**	.290*	.416**	.493**
TLL						-	.939**	.726**	.389**
TL							-	.445**	.297*
LLL								-	.417**

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

athletes before they go for selecting the players for training as well as competition.

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