Original Article

Development of Anthropometric Profile for Fast Bowlers in Cricket

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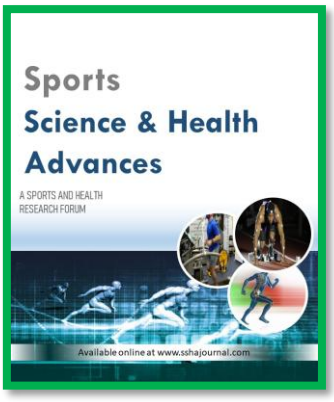
Abstract

The best performance of a fast bowler in cricket is dependent on a variety of factors. Some of these variables, like running speed, aerobic capacity, and jump heights, etc., are simple to measure. Anthropometry has been employed in numerous attempts to associate physical characteristics with racial and psychological features, for the purpose of identifying talent, to comprehend human physical variation, in anthropometry, and for various other purposes. The current study is being conducted to provide answers to these questions. Arm length, leg length, hand length, shoulder width, wrist diameter, elbow width, and palm length and width were the study's chosen variables. The fast bowlers' t-scale profile can be used to determine the optimal anthropometric of other athletes.

Keywords: Anthropometric, Fast Bowlers and Cricket



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Introduction

The first proper cricket club, Hambleton Club, was created in the mid-18th century. Marylebone Cricket Club, based at Lords in St. John's Wood, London, was founded as a result. Melbourne Cricket Club became famous quickly (MCC). According to sports history, cricket is one of the most diversified ball games ever played. It is a 13th-century English game that started in England. In the 17th century, underarm bowling changed cricket. They used a one-foot-high, two-foot-wide pitch with a hole between the stumps. They played this amazing game using curved-faced bats. From underarm to rapid speed bowling, cricket has become more competitive, dynamic, and exciting. Today, this is a highly competitive career, not a game. Win this game by without making mistakes. Batting, bowling, wicket-keeping, and fielding make up cricket. The best way to defend a score in cricket is to remove the batter, which is what the bowlers do. Batting is become more natural than bowling in daily life. Learn and practice bowling to perfect it. Bowling requires coordination, strength, and practice. Bowlers employ pace, spin, and flight trickery to confound batters. However, bowlers must be accurate, consistent, and economical. A bowler should aim to pitch the ball in the good length range as frequently as possible to improve accuracy. If you want to play a nice length ball, you must play it straight and defensively. A good length ball generates confusion about whether to play on the front foot or back foot (A. K. Tyagi, 2012).

Sports Profiling

In recent years, sports profiling has come to be seen as an essential component in the process of cultivating the level of self-awareness that is demanded of a coach by a professional sportsperson or player. The information that is obtained via sports profiling makes it possible to establish one's own anthropometric ideal and to comprehend how one's own body measurement effects one's own performance. (Singh Hardyal, 1991) No matter what degree of performance a person now has, with the knowledge gained through sports profiling, that person's performance may be improved to a far greater level. The passage of time has resulted in an increase in the difficulty of sports and games as well as an increase in the level of technical complexity; nevertheless, this has also resulted in an increase in the enjoyment that may be had from participating in sports. Because of the existence of coaches who are both highly trained and resourceful, athletes can perform at a level that is far higher than in the past, which enables them to shatter records that were previously established as well as performance barriers. It is expected of great coaches that they be specialists in all of the linked technical aspects of the sport they are coaching. (Verma J P, 2013) The study's main aim was to develop a profile on selected anthropometric variables for selected fast bowlers.

Methodology

Selection of Subjects

To achieve the aim of study, one sixty (N=100) district level male fast bowlers were selected. The subject's age ranged from 19 to 30 years old.

Selection of Anthropometric Variables

The Anthropometric Variables selected for this research study were- Arm Length, Leg Length, Hand length, Shoulder Width, Wrist diameter, Elbow Width, Palm length and Palm width.

Data Collection

The data was collected on the variables in table no. 1 for the selected fast bowlers. The measuring tool/ test used for measuring anthropometric variables were highly reliable "r" and valid.

Table 1 Anthropometric Variables and their criterion measures.

Sr. No.	Anthropometric Variables	Measuring Tool	Unit of measurement	"r" value
1.	Arm Length	Anthropometric rod	Centimeter	0.94
2.	Leg Length	Anthropometric rod	Centimeter	0.89
3.	Hand length	Sliding caliper	Centimeter	0.92
4.	Wrist Circumference	Flexible tape	Centimeter	0.88
5.	Biacromial Diameter (Shoulder Width)	Sliding caliper	Centimeter	0.91
6.	Elbow Width	Sliding caliper	Centimeter	0.87
7.	Palm length	Sliding caliper	Centimeter	0.82
8.	Palm width	Sliding caliper	Centimeter	0.94

Table 2 Administration of Test

Anthropometric variables	Testing equipment	Procedure
Leg Length	Anthropometric rod	The distance between the anterior superior iliac spine and the standing surface was measured with the anthropometric rod when the subject is in the same position as that for stature.
Arm Length	Anthropometric rod	It is the distance between acromion point and dactylion point. The subject was asked to stand in a comfortable position. One end of the anthropometric was asked to be fixed at acromion point and the anthropometric was asked to be adjusted up to dactylion point. The reading was asked to record up to nearest 1/10 of a centimeter.
Hand length	Sliding caliper	The subject was asked to ask to stand in a relaxed position with the left Ann hanging by the side. The right elbow was asked to partially flex, forearm supinated, and the finger extended (but not hyper extended) this represents length of the hand. The measurement was asked to take as the shortest distance from the mark mid stylion line to the dactylion. One branch of the caliper was asked to place on the marked mid stylion line while the other branch was positioned on the dactylion (most distal point of the third digit)
Palm Length	Sliding caliper	The distance from the middle of inters stylion to the proximal flexion crease of the middle finger.
Palm width	Sliding caliper	Sliding caliper around your dominant hand just below your knuckles (excluding your thumb) and make a fist.
Biacromial Diameter (shoulder width)	Sliding caliper	The subjects were asked to stand in a relaxed position with the arms hanging by the sides. This is the distance between the most lateral points on the acromion processes. This distance was measured with the branches of the large sliding caliper placed on the most lateral points of the acromion processes (below the marked Acromial landmark). The subject was asked to stand with the and hanging at the sides, and the measurer, standing behind the subject, should bring the caliper branches in to the acromion process at an angle of about 30° pointing upwards. Pressure was applied to compress the overlying tissues but should not move the shoulders.
Elbow Width	Sliding caliper	The individual was be asked to stand in an erect position. The elbow will raise horizontally and fore aim at 900. The distance between the medial and lateral epicondyles were measured with the help of sliding caliper with slight pressure on the cross bar up to 1/10 of a centimeter.
Wrist Circumference	Flexible tape	The subject was asked to widen Palam, and researcher placed the metal end of flexible tape in the center of subject's wrist and pull the tape over subjects' wrist to where it fits snug. Line up the tape with the metal end piece and read the measurement in centimeters.

Statistical Analysis

Descriptive statistics like minimum score, maximum score, mean and Standard deviation were analyzed for all the parameters in Table 2. Minimum and maximum scores were converted into its standard scores by using the following transformation: - $Z = \frac{(x-\mu)}{\sigma}$ Z values were converted into its linear transformed scores by using the transformation Z = 50 + 10 x Z. this way negative value of Z scores can be converted into positive scores (Verma J P, 2013).

Table 3 Descriptive statistics of Anthropometric Variables

Anthropometric Variables	Min.	Max	Mean	Std.
Arm Length	46	82	72.2840	1.68685
Leg Length	80	110	100.2020	2.26053
Hand length	13	22	19.4390	1.84586
Biacromial Diameter (Shoulder Width)	25	45	37.4160	1.69710
Wrist Circumference	8	14	5.5860	.19826
Elbow Width	3.10	8	6.5740	.25422
Palm length	7	12	10.1896	.87848
Palm width	6	12	8.5492	.41364

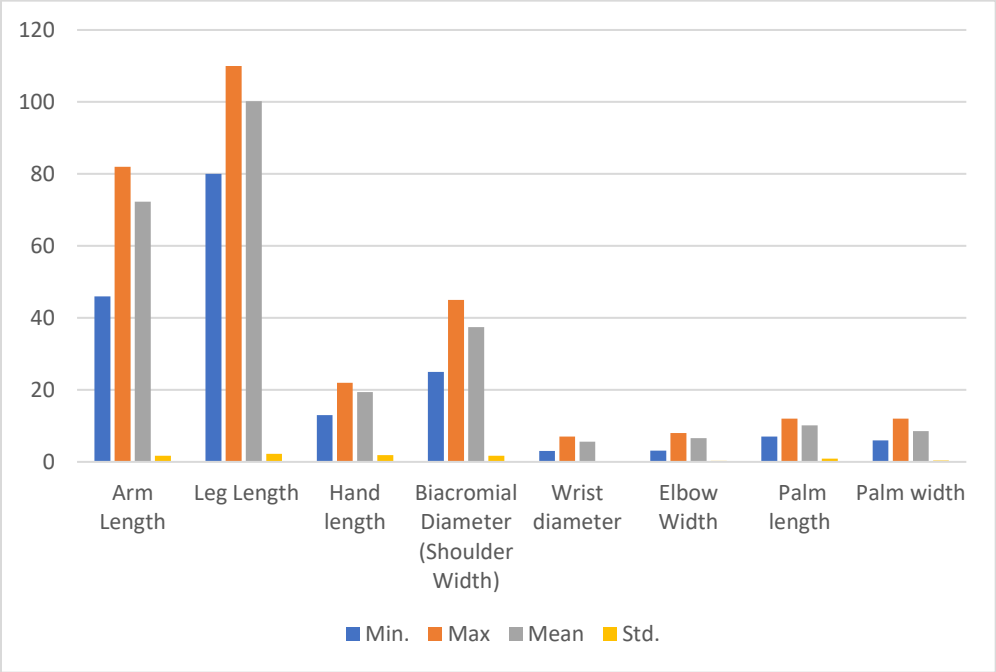

Fig 1 Descriptive bar chart of selected variables of Anthropometric variable

Fig. 1 and Table No. 1. is graphically representing the minimum, maximum, mean, and standard deviation of selected anthropometric variable of selected fast bowlers. The minimum and maximum arm length were 46 cm and 82 cm, respectively. Mean and standard deviation of Arm Length of selected fast bowlers were 72.28±1.68 cm. The minimum and maximum leg length were 80 cm and 110 cm, respectively. Mean and standard deviation of Leg Length of selected fast bowlers were 100.20±2.26 cm. The minimum and maximum hand length were 13 cm and 22 cm, respectively. Mean and standard deviation of Hand length of selected fast bowlers were 19.43±1.84 cm. The minimum and maximum Shoulder Width were 25 cm and 45 cm, respectively. Mean and standard deviation of Shoulder Width of selected fast bowlers were 37.41±1.69 cm. The minimum and maximum Wrist circumference were 8 cm and 14 cm, respectively. Mean and standard deviation of Wrist circumference of selected fast bowlers were 5.58±0.19 cm. The minimum and maximum Elbow Width were 3.10 cm and 8 cm, respectively. Mean and standard deviation of Elbow Width of selected fast bowlers were 6.57±0.25 cm. The minimum and maximum Palm length were 7 cm and 12 cm, respectively. Mean and standard deviation of Palm length of selected fast bowlers were 10.18±0.87 cm. The

minimum and maximum palm Width were 6 cm and 12 cm, respectively. Mean and standard deviation of palm Width of selected fast bowlers were 8.54±0.41 cm.

Table 3 Standard score of minimum, maximum and average of all the variables.

Variables	Minimum(Z)	Mean(Z)	Maximum(Z)
Arm Length	-15.5817	0	5.759848
Leg Length	-8.93684	0	4.334382
Hand length	-3.48835	0	1.387429
Biacromial Diameter (Shoulder Width)	-7.31601	0	4.4688
Wrist Circumference	-13.0435	0	7.132049
Elbow Width	-13.6653	0	5.609315
Palm length	-3.63082	0	2.060832
Palm width	-6.16285	0	8.34252

Table 4 Transformed standard score of minimum, maximum and average of all the

Variables	Minimum	Mean	Maximum
Arm Length	-105.817	50	107.5985
Leg Length	-39.3684	50	93.34382
Hand length	15.11653	50	63.87429
Biacromial Diameter (Shoulder Width)	-23.1601	50	94.688
Wrist Circumference	-80.4348	50	121.3205
Elbow Width	-86.6533	50	106.0931
Palm length	13.69183	50	70.60832
Palm width	-11.6285	50	133.4252

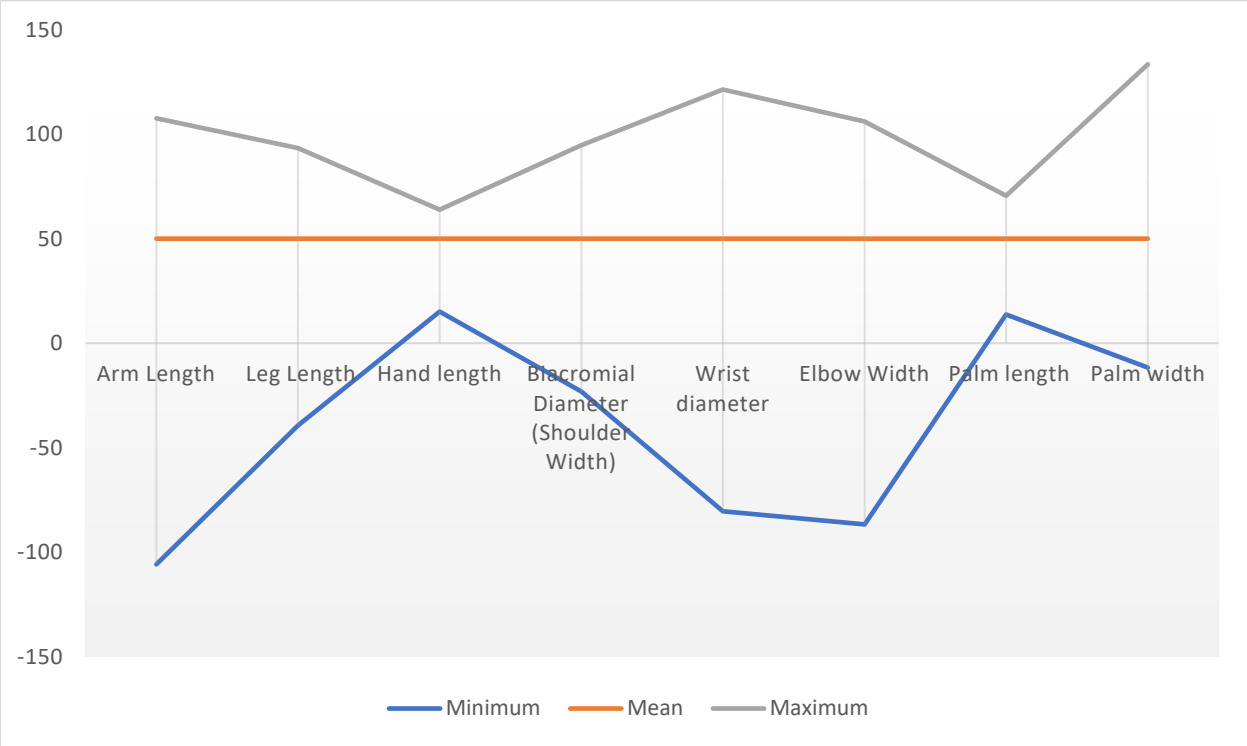

Fig 2 Profile chart of selected variables of anthropometric variable

Developing Profile

Table 2 presents some selected anthropometric characteristics together with their associated descriptive data, including their means, standard deviations, and ranges. Following the completion of the calculations for the descriptive statistics, Table 3 presents the converted and standardized z-scores for the mean, maximum, and minimum values. Z-scores were computed by dividing the X-MEAN value by the standard deviation. In order to facilitate the process of comparing a variety of parameters, standardized scores were converted into a Z-scale using the formula Z=50+10*Z (Table 4).

Figure 3 illustrates the graphical range of an anthropometric attribute that was previously selected. To determine the level of skill possessed by any given fast bowlers, it is essential to possess the profile data for the many anthropometric factors that have been selected. After collecting the data for all of the different factors, you will need to divide the raw score by the standard deviation in order to arrive at the standard score (z). Now, the z-score that was obtained is converted into a t-scale so that comparisons may be made, and players can be chosen.

Conclusion

The selected research study focused on developing profile on anthropometric variables for selected fast bowlers on t-scale. The developed profile can be used to assess the anthropometric variable of fast bowlers to determine whether, a player possess the required Arm Length, Leg Length, Hand length, Shoulder Width, Wrist Circumference, Elbow Width, Palm length and Palm width.

Conflict of Interest: No Conflict of Interest Declared among authors

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