



PREDICTION OF PERFORMANCE OF CRICKETERS ON THE BASIS OF ANTHROPOMETRIC VARIABLES

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ABSTRACT

The purpose of the study was to find the relationship of performance of cricket players with selected anthropometric variables (standing height, weight, arm length, leg length, palm length, thigh girth, wrist girth, body fat percentage). Sixty male cricket players were participated as the subject in this particular study. The samples were selected from the different parts from Kerala who have represented university or state, on the basis of simple random selection technique. The age of the subject was ranging between 18 to 25 years. The age of the subjects was recorded on basis of date of birth in the Aadhar card. To know the nature of the data descriptive statistics i.e., mean, standard deviation was calculated. To know the relationship of selected anthropometric variables with cricket performance Pearson product moment correlation were calculated. Along with that multiple correlation and regression analysis also calculated with the help of SPSS software. The finding of the study shows that Cricket Performance was found significantly correlated with body fat percentage and arm length. (-.632, .253) were found higher than the tabulated value at 0.05 level of significance. The result revealed that there was significant relationship between anthropometric variables (independent) and cricket performance (dependent variable) as coefficient of multiple correlation.632 is higher than the tabulated value at 0.05 level of significance and regression model is significant for prediction of criterion variable and model can be further prediction, as values of F (38.669) was found significant at 0.05 level of significance. Further regression equation were formed as $Y = 7.059 - .092(\text{body fat}) + .035(\text{arm length})$

KEYWORDS : anthropometric variables

INTRODUCTION

Cricket is one among the famous sports in India. According to a European language expert Heiner Gillmeister, the term 'cricket' was derived from a Middle Dutch phrase, met de sen (krik ket), which means "with the stick chase".

"Cricket is a Team Game Where Individuals Inspire Each Other to Achieve Performances Which Surpass What Might Otherwise Be beyond them." – Richard Lloyd.

Various factors are responsible for better performance of a cricket player. Skill and physical condition of the players, physiological responses to body mechanism, amelioration of psychological stress, nutrition, hydration, environmental conditions etc. Each format of the game (T20, One day internationals and test cricket) needs certain specific qualities for a long competitive career. Understanding of these qualities include anthropometric variables that have an impact on the performance of the players.

Anthropometric and physical factors work hand- in-hand in the performance of an individual. Anthropometry has also been defined as the science of measurement applied to the human body including height and weight measurements, and selected body and limb girths. It is the measurement of body segments through scientifically prescribed manner in which a person's fat mass, fat free mass and all the body parts can be evaluated.

Human motor performance is a combination of many variables, one of which is structure of the body and specific measurements of the limb-length, circumference, breadth and build indicates the relationship between anthropometry of the athlete and motor fitness. Anthropometry plays a vital role for sports coaches and scientists. The relationship between morphological variables and sports performance is the objective of the study of anthropometry and is an important element to be analyzed.

MATERIAL & METHODS

Participants

For the purpose of this study sixty professional cricket players (thirty batsman and thirty bowlers) from 18-25 years of age, selected from different parts of Kerala, state players/ state level tournaments/ state camp. The subjects were selected by random sampling method.

Procedure

Before the data collection all the participants were properly given a detail of introduction, aims and objectives of the study, by the researcher. A consent form was distributed immediately after the introduction explaining its importance. Adequate amount of time was provided for the subjects to prepare mentally for the data collection and all the selected anthropometric variables data were collected under the supervision and direction of researcher.

Criterion Measures

Table 1: Selected Variables, Their Criterion Measures And Units Of Measurement

NO	VARIABLE	EQUIPMENT/TEST	UNIT
1	Standing height	Anthropometric rod	Centimeter
2	Weight	Weighting machine	Kilogram
3	Arm length	Steel tape	Centimeter
4	Leg length	Steel tape	Centimeter
5	Palm length	Steel tape	Centimeter
6	Thigh girth	Steel tape	Centimeter
7	Wrist girth	Steel tape	Centimeter
8	Body fat percentage	Skinfold caliper	Millimeter

Performance In Cricket

Performance in cricket was measured by judging their ability in playing. The ability of each player to play was judged on a rating scale of 10, a panel of expert and the average of three scores was consider as playing ability.

Statistical Analysis

1. To find out correlation between dependent variables (cricket performance) and independent variable (anthropometric) Pearson's product moment method of correlation was used.

- To find out joint contribution of independent variables (anthropometric) in predicting dependent variable (performance of cricket players) multiple correlation was used.
- For predicting dependent variable (performance of cricket) on the basis of independent variable (anthropometric) multiple regression equation was established.

RESULTS

The data was analyzed using product moment correlation to find out the relationship of selected anthropometric variables to cricket performance. The results pertaining to the relationship are presented below.

Table 2: Product Moment Correlation Analysis

VARIABLES	CORRELATION COEFFICIENT	Sig
Standing height	.172	.094
Weight	-.116	.189
Arm length	.253	.026
Leg length	.104	.214
Palm length	-.072	.292
Thigh girth	-.160	.111
Wrist girth	.053	.343
Body fat percentage	-.632	.000

Significant Level (p<.05)

Table -2 revealed that Cricket Performance was found significantly correlated with body fat percentage and arm length. (-.632, .253) were found higher than the tabulated value at 0.05 level of significance. Cricket performance was found not significantly affected with height, weight, wrist girth, thigh girth, leg length, palm length, as the correlation coefficient values were found lower than the tabulated value at 0.05 level of significance.

Multiple Correlation Analysis

Table 3: Multiple Correlation Analysis

Dependent variable	Independent variable	Coefficient of multiple correlation	Sig
Cricket performance	Standing height	.632*	.000
	Weight		
	Arm length		
	Leg length		
	Palm length		
	Thigh girth		
	Wrist girth		
	Body fat percentage		

Significant level (p<.05)

This table indicates the significant relationship between anthropometric variables (independent) and cricket performance (dependent variable) as coefficient of multiple correlation .632 is higher than the tabulated value at .05 level of significance.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.632 ^a	.400	.390	.35079

The above table shows that adjusted R square (.390) as predictor was included, which means that 39.0% of the variance in the performance of cricket performance was associated with changes in the anthropometric variables.

Table 5: Analysis Of Variance For The Regression

Significant level at 0.05 level.

Finding of these tables revealed that, developed regression model is significant for prediction of criterion variable and model can be further prediction, as values of F (38.669) was found significant at 0.05 level of significance

Multiple Regression Analysis

The multiple regression equation for predicting hockey performance on the basis of anthropometric resulted in the following

Equation

$$Y = 7.059 - .092(\text{body fat}) + .035(\text{arm length})$$

DISCUSSION

From anthropometric variables, arm length and percentage of body fat were found to be significant in cricket performance of state/university players. Similarly, Bodhisattwa Pradhan, K Banerjee and S Bhowmick (2018) conducted a study on relationship of selected anthropometric parametric parameters with performance of, off drive in Cricket. They also found that Weight of the subject had significant positive correlation with performance of, off drive in cricket. Upper and lower arm length and body height of the subjects exhibited positive relationship in the performance of, off drive in cricket.

Shweta Satish Devare Phadke and Safia Azmi (2016) conducted a study on Hand Anthropometry and Hand Function in Elite Cricket Bowlers – Correlation Study. In this study the stepwise multiple regression analysis indicates that hand-length in spinners and pace bowlers is significant predictors of Hand Function. Thus, individuals who have more hand-length do have higher potential in being a good bowler.

The statistical analysis of the data has clearly indicated that those selected anthropometric variables were not significantly related to performance i.e. height, weight, leg-length, thigh girth, wrist girth and palm length. But in relation to multiple correlations, a significant multiple correlation coefficients were found between anthropometric variables cricket performance.

Regression equation findings as shown above mainly have identified Height, Weight, Arm Length, palm length, Leg Length, Thigh Girth, wrist girth, and Percentage of Body Fat from anthropometric variables, as determining variables of cricket performance.

In equation the combination of constant, body fat percentage and arm length could provide a reasonably good estimation of cricket performance in cricket players.

CONCLUSION

The ability in playing cricket was found significant with selected anthropometric variables.

Within the limitation of the study, the following conclusions appeared justified as per the result obtains:

- The Anthropometric variable namely arm length and percentage of body fat are significantly related to the performance of cricket players.
- Height, weight, palm length, leg length, wrist girth and thigh girth (anthropometric variables) are not found significantly related to performance of cricket players.
- The regression equation for estimating cricket performance of state or university Cricket players on the basis of selected Anthropometric variables is: $Y = 7.059 - .092(\text{body fat}) + .035(\text{arm length})$

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Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.758	1	4.758	38.669	.000
Residual	7.137	58	.123		
Total	11.895	59			