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A RELATIONSHIP STUDY OF BATTING PERFORMANCE WITH BODY COMPOSITION VARIABLES

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This research aimed to ascertain the connection between body composition characteristics and cricket batting performance. Using random sampling, a total of 25 male participants were chosen from the cricket academy, practice game, and camp in Haryana. The participants were all frequent gamers with high skills, ranging in age between 17 to 28 (19.16 + 1.37). In this study, the following variables were measured: body density, fat weight, fat percentage and lean body mass. The Pearson correlation approach, stepwise multiple regression, and descriptive statistics were all employed for analysis in this study. The level of significance was 0.05. The outcome of this analysis showed the only body composition characteristics that accurately predicted cricket batting performance was player fat percentage.

Keywords: Regression, Body Composition, Batting Performance, Cricket

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Introduction

The popularity of cricket rivals that of football, making it the most popular sport in the world. This is due to the game's endearing qualities, which speak to players on a more fundamental level. In developing and underdeveloped countries, cricket has evolved from an alien pastime into something closer to a national pastime. In a country like India, where cricket isn't the official national sport, the game's popularity has grown over the years and it's enjoyed by fans of all demographics. Seasonal variations in The Game's schedule were implemented in accordance with the local surroundings and climate. (Kumar, N., Garg, R.P. 2022) A few decades ago, for instance, the sport was played throughout Asian countries in the winter and across European countries in the summer. Season and location are no longer major factors in the game, as it is played year-round. This led to an increase in the number of games played annually, which in turn required players to commit to more regular training sessions. The consistent coverage helped boost the game's profile, which in turn encouraged more people to give it a try by encouraging the organisation of matches at lower skill levels in addition to international events. With these benefits now established, cricket has evolved into a sport worthy of interest from both fans and competitors. (Singh, 1988). Several different types of games and sports have certain anthropometric and physical qualities that are either required for success or highly regarded by experts in the field. Nonetheless, there are numerous additional factors that influence an athlete's performance. All of these physical characteristics and stats play a major role in determining an athlete's potential (Reco-Sanz, 1998; Wilmore & Costill, 1999; Keogh, 1999). In his book Anthropometry, Heyward (2006) explains that BMI, height, circumference, skin fold thickness, and bone width are the most important measurements (2006).

The purpose of this research was to investigate whether there is a correlation between anthropometric characteristics and cricket batting ability. Furthermore, the goal is to establish normative relationships between specific anthropometric measures and cricket batting averages.

Procedure and Methodology

The study aimed to determine the relationship between body composition variables and the batting performance in cricket. Total 25 male subjects were selected from cricket camp, practice match and cricket academy in Haryana by using random sampling. The age range of the subjects was from 17-28 years and all were regular players with good level of skill. The 04 predictor (independent) variables such as Body density, fat weight, lean body mass (LBM) and Fat percentage were selected.

Batting Performance (Dependent variable)The selected cricket batsmen's performances were measured against assessments made by three veteran cricket coaches. The criteria for evaluation were laid forth by the researcher. Each coach will use a 10-point scale to rate the selected players' performance in each category of evaluation. The final grade for each subject is calculated by adding together the scores given by all three coaches and then dividing by 3. The ratings given by the coaches have a strong correlation with one another.

RESULT AND DISCUSSION

Table 1: Descriptive statistics of anthropometrics variables with the batting performance in cricket

Enclosed as Annexure 01

Table 1 indicates the descriptive analysis for selected Body composition variables of national-level male cricket batsmen. The mean and standard deviation of Body density is 1.05 ± .00474, Fat weight is 10.28 ± 3.62, Lean body mass is 59.16 ± 5.29, Fat percent is 14.72 ± 5.06 and Batting performance is 8.40 ± .95. The Mean and S.D difference has been shown picturesquely in figure1.

Figure No.: 1 of Mean And S.D

Enclosed as Annexure 02

Table 2: Product moment correlation coefficients between anthropometric variables and batsmen performance

Enclosed as Annexure 03

The batting performance of the chosen cricket batters is correlated with the body composition characteristics, as per Table No. 2. Only onevariablei.e. Fat percentageis found to be significantly correlatedwith one another and with all other body composition variables. The correlation coefficients for Fat percentage

(R=.41; p=.039) demonstrate a linear and significant link between the Fat percentage and performance. The performance is determined to be unaffected by none of the other factors, though.

Correlations are a very useful research tool, but they do not tell anything about the predictive power or real relationships between the variables. Even in this situation, a positive correlation does not imply that performance will get better as the value of the predicted variable increases. It will fall within a specific range and not exceed a predetermined limit. Regression analysis created a prediction model that best fit the available data in order to predict the value of dependent variables of one or even more independent variables. Given there are numerous predicted variables in this study, the researcher applied multiple regression. After confirming all the presumptions, the researcher opted to do a multiple regression analysis with the remaining variables to see whether a model could be created.

Table 3: Regression Analysis of Predictive Equation of Batting performance of cricket Players

Enclosed as Annexure 04

As a key dependent variable, cricket performance was tested, and a total of fourBody composition factors were added into the equation by stepwise multiple regression to determine the best predictor. Only fat % is the strongest predictors of cricket performance out of the total 4. The squared r value of the correlation between Fat % and cricket performance was .172, suggesting that fat % is a significant predictor of performance. This variable accounted for 17.2% of the overall variation. As far as fat % in body composition measures are concerned, however, the rest of the factors failed to predict the batting performance of the players.

Table 4: anova a

Enclosed as Annexure 05

The result of the above performed regression anova distinctly exhibits the anticipatedprototype with F - values of 4.768 and with a significance level of .039. we can say that the predicted model had a high F value.

Table 5: Coefficientsa

Enclosed as Annexure 06

In the 1st model the beta value for Fat % as a predicted variable is..414. For the sustained and anticipated variables the value of of t test varied from -2.184 to 17.136, with the level of significance ranging between 0.039- 0.000.

Equation created: - The regression equation was generated using the regression coefficients (B) of the model provided in table 5:

Batting Performance = 9.554 - .078(X1)

X1- Fat Percentage

Finding

The study's findings are corroborated by a study done by Harish, P. M. (2015) to investigate the association between anthropometric factors and basketballer ability. The study'sconclusion reveals a correlation between the chosen anthropometric factors and basketballer ability.Results of study also supported by Kanaujia, S. (2014) conducted a study on "Anthropometric measurement and batsman performance of east zone inter-university cricket players" and results show that All selected Anthropometric variables have no significant relationship with Batting Performance. i.e., (weight, height, leg length, arm length, lower leg length, fore arm length, upper arm length, thigh girth, hand length, calf girth). Nagar, L., Meena, D.S., and Singh, B. (2012) also acknowledge the result of the investigation i,e; to examine the Correlation between above mentioned physical fitness and anthropometric variables with respect to basketball performance. And the results show that anthropometric variables i.e. Abdomen circumference, etc. are responsible for batting performance in cricket.

Conclusion

Although Only Fat %was identified to be the only factors included in the regression model for the current study, this does not indicate that the other variables did not contribute in any way. They may have an effect on performance in other ways, but they were not chosen for the current model. Fat % explain 17.2% of the variation in the batting performance which means the regression model is good enough to generalize. But still in another way it can be concluded that fat % is the factor that may influence batting performance.

Other findings have been reached as well –

01. A significant relationship was discovered in body composition factors (Fat % - r=.41; p<.05) in relation to batting performance in cricket.

02. Insignificant relationship was found in Body density (r=.20), Fat weight (r=.37)&lean body mass (r=.14) in relation to batting performance in cricket.

03. For the current investigation, only one variable was included in the development of the regression model i.e., Fat percentage and it explains17.2% of the variation in the batting performance in cricket.

Annexures

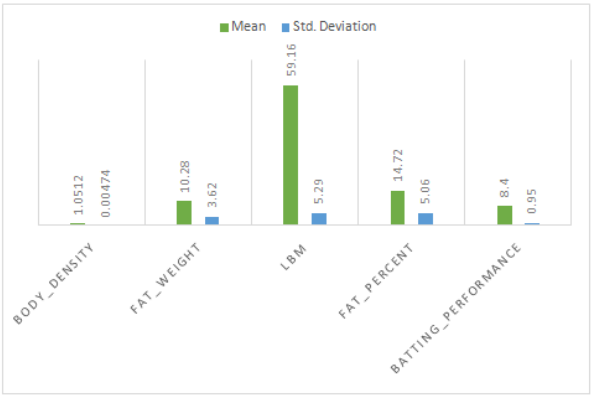
Annexure 01

Table 1: Descriptive statistics of anthropometrics variables with the batting performance in cricket

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Body_Density	25	1.04	1.06	1.0512	.00474
Fat_weight	25	3.00	18.00	10.2800	3.62
LBM	25	51.00	70.00	59.1600	5.29
Fat_percent	25	4.00	26.00	14.7200	5.06
Batting_Performance	25	6.00	10.00	8.4000	.95

Annexure 02

Figure No.: 1 of Mean And S.D



Annexure 03

Table 2: Product moment correlation coefficients between anthropometric variables and batsmen performance

X1-Fat weight
X2-Body density
X3-Lean body mass
X4-Fat percentage

Factors	X1	X2	X3	X4
B. P	.37	.20	.14	.41
X1		.53	.24	.95
X2			.30	.40
X3				.48

Annexure 04

Table 3: Regression Analysis of Predictive Equation of Batting performance of cricket Players

Model	R- Value	R Square	Adjusted R2	Std. Error of Estimate
1	.414[a]	.172	.136	.89011

a. Predictors: (Constant), Fat percentage

Annexure 05

Table 4: anova a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.777	1	3.777	4.768	.039[b]
	Residual	18.223	23	.792		
	Total	22.000	24			
a. Dependent Variable: Batting_Performance						
b. Predictors: (Constant), Fat_percent						

Annexure 06

Table 5: Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.554	.558		17.136	.000
	Fat Percetage	-.078	.036	-.414	-2.184	.039

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