International Journal of Physical Education and Sports Sciences
Vol. 14, Issue No. 3, June-2019, ISSN 2231-3745

Fast Bowling Ability and its Relationship with Power Parameters in Cricket

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Abstract – To achieve the purpose of the study, the investigator selected 100 fast bowlers who have represented in inter-collegiate cricket tournament from four colleges affiliated to Andhra University. The subjects were from the age group of twenty to twenty five years. All the subjects had played cricket for more than five years. Only volunteer, healthy and physically fit subjects were selected for this study. The investigator selected following criterion and dependent variables for this study power Parameters were Shoulder Strength, abdominal Strength, hand Grip strength and anaerobic power. To measure the velocity of the cricket players balling velocity the instrument used Radar Guns or Speed Guns to collect the data. To get meaningful findings the following statistics tools were used descriptive statistics mean and standard deviation, Simple correlation and multiple regression analysis was used. The findings of the study proved theirwas significant relationship between power parameter abdominal strength and force parameter upper body strength with fast bowling ability.

Key Words:- Bowling Ability, Power Parameters, Cricket Players.

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INTRODUCTION

"Bowling, in cricket, is the action of propelling the ball toward the wicket defended by a batter. A player skilled at bowling is called a *bowler*; a bowler who is also a competent batter is known as an all-rounder. Bowling the ball is distinguished from *throwing* the ball by a strictly specified biomechanical definition, which restricts the angle of extension of the elbow. A single act of bowling the ball towards the batsman is called a *ball* or a *delivery*. Bowlers bowl deliveries in sets of six, called an *over*. Once a bowler has bowled an over, a teammate will bowl an over from the other end of the pitch. The Laws of Cricket govern how a ball must be bowled. If a ball is bowled illegally, an umpire will rule it a no-ball. If a ball is bowled too wide of the striker for the batsman to be able to play at it with a proper cricket shot, the bowler's end umpire will rule it a wide".

Power is the capacity of an individual to bring into play maximum muscle contraction at the fastest rate of speed of all the conditional abilities. Power is one of the most important factor in sports. The conditional abilities and co-ordination abilities are affected to a lesser or greater extent by power ability. Depending upon the magnitude and type of resistance to be tackled in sports, the sportsman of different sport needs different levels of speed, endurance, technique, tactics and other co-ordinative abilities. It is impossible to perform if the sportsmen lack the requisite amount of power. Due to the above facts power parameters, shoulder strength, abdominal strength, hand grip strength, anaerobic power were selected as a variable of this study."

OBJECTIVES OF THE STUDY

The aim of this study was to find out fast bowling ability and its relationship with power parameters in cricket. In doing so, the investigator would assess

(a) Power parameters, shoulder strength, abdominal strength, hand grip strength, and anaerobic power of cricket players.

(b) To find out relationship between bowling ability and selected power parameters of the cricket players.

(e) To predict fast bowling ability through selected power parameters of cricket players.

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the fast bowling ability and its relationship with power parameters in cricket.

HYPOTHESIS

The problem the following hypotheses were formulated.

1. It was hypothesized that the power parameters, shoulder strength, abdominal strength, hand grip strength, and anaerobic power would be significantly associated with fast bowling ability of cricket players.

2. It was hypothesized that the fast bowling ability could be successfully predicted through selected power, parameters of cricket players.

METHODOLOGY

To achieve the purpose of the study, the investigator selected 100 fast bowlers who have represented in inter-collegiate cricket tournament from four colleges affiliated to Andhra University. The subjects were from the age group of twenty to twenty five years. All the subjects had played cricket for more than five years. Only volunteer, healthy and physically fit subjects were selected for this study. The investigator selected following criterion and dependent variables for this study power Parameters were Shoulder Strength, abdominal Strength, hand Grip strength and anaerobic power. A repeated measure research design was used with fast bowling ability as the criterion variable and selected speed, parameters as the predictor variables. Pushups, sit ups, dynamometer and Margarita kulaman test were used in this study and their calibrations were accepted as reliable at par with international standards. To measure the velocity of the cricket players balling velocity the instrument used Radar Guns or Speed Guns to collect the data. To get meaningful findings the following statistics tools were used descriptive statistics mean and standard deviation for the selected criterion and predictor variables were calculated separately. Simple correlation to examine the relationship between the tests – retest scores of each variable to intra class reliability of the tests conducted and to find the relationship between selected criterion variables and predictor variables, Pearson's correction coefficient was calculated. Multiple regression analysis was used to examine the relationship between the fast bowling speed of the subjects with selected power parameters, such as Shoulder Strength, abdominal Strength, hand Grip strength and anaerobic power, and to predict the fast bowling ability with selected power parameters.

DESCRIPTIVE ANALYSIS

Table I

Showing Descriptive Statistics on Physical fitness Variables selected for this study

VARIABLES	MEAN	STD. DEVIATION	N
Fast bowling ability	1113.74	42.836	100
Shoulder Strength	34.03	4.565	100
Abdominal Strength	50.56	4.471	100
Hand Grip Strength	38.27	4.139	100
Anaerobic Power	1011.25	78.625	100

Table I shows that the obtained mean value on shoulder strength was 34.03 with standard deviation $\pm$ 4.565. The mean value on abdominal strength was 50.56 with standard deviation $\pm$ 4.471. The mean value on hand grip strength was 38.27 with standard deviation $\pm$ 4.139. The mean value of anaerobic power was 1011.25 with standard deviation $\pm$ 78.625.

ANALYSIS OF COEFFICIENT OF CORRELATION

Table: II

Showing Correlation of Coefficient between Power Parameters and fast bowling ability of the subjects

S. No.	Variables Fast bowling ability Vs	Correlation Coefficient	Level of Sig.
1	Shoulder Strength	-0.169	NS
2	Abdominal Strength	-0.329*	<0.05
3	Hand Grip Strength	0.110	NS
4	Anaerobic Power	0.064	NS

Required table r value $(1,99)_{0.05} = 0.197$

* Significant at 0.05 level.

The results presented in Table II proved that there was a significant relationship between fast bowling ability and abdominal strength (r: -0.323) as the obtained 'r' value is greater than the required 'r' value of 0.197 to be significant at 0.05 level. However, there was no significant relationship between fast bowling ability and shoulder strength (r: -0.169) fast bowling ability and hand grip strength (r: 0.110) and fast bowling ability and anaerobic power (r : 0.064) as the obtained 'r' values were lesser than the required 'r' value of 0.197 to be significant at 0.05 level.

ANALYSIS OF MULTIPLE REGRESSIONS

Table III

Showing ANOVA for Variables Shoulder Strength, Abdominal Strength, Hand Grip Strength and Anaerobic Power

VARIANCE	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Regression	19637.627	1	19637.617	11.878*	0.001
Residual	162015.62	98	1653.221		
Total	181653.24	99			

A. Predictors: (Constant), Shoulder Strength, Abdominal Strength, Hand Grip Strength and Anaerobic Power

B. Dependent Variable: Fast bowling ability

It is clear from the table III that the obtained F value 11.878 was significant at 0.00 level. It revealed that the power parameters were influencing the fast bowling ability of cricket players. As the F ratio was significant, multiple regressions were computed.

The stepwise multiple regressions between selected power parameters fast bowling ability of cricket players is presented in table IV.

Table IV

STEPWISE MULTIPLE REGRESSION BETWEEN SELECTED POWER PARAMETERS AND FAST BOWLING ABILITY OF CRICKET PLAYERS

MODEL	R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE
4	0.329	0.108	0.099	40.66

A. Predictors: (Constant), Shoulder Strength, Abdominal Strength, Hand Grip Strength and Anaerobic Power.

Table V reveals that among the selected power parameters abdominal strength was very much influencing the fast bowling ability of cricket players. From R Square value it is clear that 11% of fast bowling ability of cricket players was mainly due to these power parameters.

The variables in the equation are given in **Table V**.

Table V

VARIABLES IN THE EQUATION OF CRICKET PLAYERS

Variables	B	SE B	Beta	't'	Level of Sig.
(Constant)	1273.02	46.394		27.44	0.000
Abdominal Strength	-3.150	0.914	-0.329	-3.447	0.001

Multiple Regression Equation

Fast bowling ability of cricket Players on power parameters is as follows:

= 1273.02 -3.150 (Abdominal Strength)

DISCUSSIONS ON FINDINGS AND HYPOTHESIS

The simple correlation coefficient between each of the selected power parameters with the fast bowling ability proved that abdominal strength and shoulder strength were significantly related with fast bowling ability and there were no significant relationships between fast bowling ability and hand grip strength and anaerobic power. as the obtained 'r' values were lesser than the required table 'r' value to be significant at 0.05 level.

Multiple regression analysis was made and the equation included abdominal strength with obtained 't' values greater than the required table 't' value required to be significant at 0.05 level. Thus, the power parameters shoulder strength, hand grip strength and anaerobic power were found to be excluded as the obtained t' value was lesser than the required table value to be significant at 0.05 level. And the variables abdominal strength was included in the equation with the multiple correlation.

Fast bowling ability of cricket Players with power parameters

= 1273.023 – 3.150 (abdominal strength)

It was hypothesized that the power parameters, shoulder strength, abdominal strength, hand grip strength, and anaerobic power would be significantly associated with fast bowling ability of cricket players. The results proved that there was significant relationship between abdominal strength with fast bowling ability and the formulated hypothesis No. 2 was accepted at 0.05 level. However, as for the remaining speed parameters shoulder strength, hand grip strength and anaerobic power there was no significant relationship and the formulated hypothesis was rejected to that extent.

FINDINGS

The findings of the study proved their was significant relationship power parameter abdominal strength and

force parameter upper body strength with fast bowling ability.

CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn.

1. It was concluded that power parameters abdominal strength was significantly related with fast bowling ability of cricket players.

2. It was concluded that the fast bowling ability can be successfully predicted through the following power parameter expressed in equation

Fast bowling ability of cricket players

= 1273.023 – 3.150 (Abdominal strength)

3. It was concluded that force parameter upper body strength was significantly related with fast bowling ability of cricket players.

4. It was concluded that fast bowling ability can be successfully predicted from the following force parameter expressed in equation: Fast bowling ability of cricket players.

= 734.036 + 30.627 (Upper Body Strength)

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