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## Relationship of selected kinematic variables with the performance of cricket players in cover drive shot Uttarakhand under-19 team

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### Abstract

The purpose of this study was to measure the relationship of selected biomechanical variables to the performance of cricket player in cover drive shot. The subjects for this study were twelve male cricket players of Uttarakhand Under-19 Team. All the subjects were right handed batsman. The data was analyzed by use of Pearson's Product Moment Correlation. The level of significance chosen to test the hypothesis was .05. None of the selected angular kinematic variables that is Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) has significant relationship with the performance of Cricket players in cover drive shot. In case of Linear A biomechanical (kinematic) variable that is height of center of gravity at moment contact does not have significant relationship with the performance of Cricket players in cover drive shot.

**Keywords:** Biomechanical, Kinematics, Cover Drive

### Introduction

Physical education seems to have taken a new turn in the form of sport sciences. The sport sciences in turn have taken their substance and methodology from various basic sciences. For many years the research in sport was being undertaken within these basic sciences but with the advancement of knowledge the new specialization and micro-specializations have evolved a respectable position. As a matter of fact that the research now a day's embraces knowledge from various disciplines of human sciences. In India too in the recent years some research work had been going on in the basic discipline, pertaining to sport. Physical education and sport, being an integral part of education have also experienced the impact of scientific advancements. Now the sportsman has been able to give outstanding performance because of involvement of new scientifically substantiated training methods and means of execution of sport exercises such as sports techniques and tactics, improvement of sportswear and equipments as well as other components and conditions of the system of training.

Cricket is one of the most popular and richest in history of all ball games. There is no record available which shows when and by whom cricket was started in England. It is essentially an English game. Old work shows that it is as old as 13<sup>th</sup> Century. The game eventually developed in the 17<sup>th</sup> century with underarm bowling, curved bat and a wicket of two feet wide and one foot high with a whole in the ground between the stumps. Cricket is a game of intricate movements combined with great speed and accuracy. Great teams are developed by the meshing of fundamentally sound players weaving clever patterns of attack and defense tactics.

There is a wide variety of shots played in cricket. The batsman's repertoire includes strokes named according to the style of swing and the direction aimed: e.g., "Cut", "Drive", and "Hook", "Pull". It is universally accepted that success of a team in cricket depends upon a greater extent on the hitting ability of the players.

Thus in cricket driving (or to use the pace of the ball) is a primary skill of the game and requires a great deal of practice assisted by good models, scientifically based. Since players were expected to drive often in order to score, they developed a variety of drives, which include the straight drive, the cover drive, the square drive, and the on drive.

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Biomechanics and Cricket players in cover drive shot practices described by some of the authors are as follows: -

### Kinematics

A branch of physics concerns with the description of the motion of objects without considering the forces that causes or result from the motions. It is a study of motion that aims to provide a description of the spatial position of points in moving bodies. For the purpose of this study Kinematics variables were represented by the selected angles of the various joints of human body and height of center of gravity at moment contact.

### Cover Drive

Cover Drive also called off drive; this is a batting stroke in which slightly over pitch ball is struck with full downward swing off perpendicular bat. Cover drive is usually played to a length ball pitching just outside off stump by which the ball is sent pass cover point the bats taken back with a good back lift and the front foot moved across to place it just near to the spot where the ball is likely to pitch. The bat is brought forward with a straight swing close to the front leg, and the weight of the body transferred to the front foot. The ball played powerfully to the mid-off or extra-cover region.

### Methodology

The subjects for this study were twelve male cricket players of Uttarakhand Under-19 Team. All the subjects were right

**Table 1:** Relationship of Selected Angular Kinematical Variables at Moment Contact with the Performance of Uttarakhand Under-19 Team in cover drive (N = 12)

S. No	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	-0.208
2.	Ankle Joint (Right)	-0.274
3.	Knee Joint (Left)	-0.384
4.	Knee Joint (Right)	-0.267
5.	Hip Joint (Left)	-0.323
6.	Hip Joint (Right)	-0.402
7.	Shoulder Joint (Left)	0.553
8.	Shoulder Joint (Right)	-0.318
9.	Elbow Joint (Left)	-0.437
10.	Elbow Joint (Right)	-0.551
11.	Wrist Joint (Left)	0.00
12.	Wrist Joint (Right)	0.033

\*Significant at 0.05 Level

r .05 (10) = 0.576

As shown in Table-1 that the values of Coefficient of Correlation in case of all the selected Kinematic variables with the Uttarakhand Under-19 team were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 10 degree of freedom is 0.576 and the obtained values of Coefficient of Correlation of selected variables less than the required value. The correlation could not be calculated with the left wrist joint because the

handed batsman. The research scholar familiarized subjects with the testing equipments and procedures. Following were the Kinematic variables which were constituted in the study: The selected kinematical variables were divided in two parts i.e.

a) Linear Kinematic Variable were:

i. Height of Center of Gravity at moment release.

b) Angular Kinematic Variables were represented by the angles at selected joints i.e.

1. Ankle joints
2. Knee joints
3. Hip joints
4. Shoulder joints
5. Elbow joints
6. Wrist joints

The scholar developed stick figures on the photographs, from which selected kinematical variables were calculated. The stick figures were developed by using Joint-point method. The center of gravity of each subject, at one selected moment.

### Procedure for location of center of gravity

The center of gravity of the body at moment release was determined by use of segmentation method.

### Analysis of data and results of the study

The data was analyzed by use of Pearson's Product Moment Correlation. The level of significance chosen to test the hypothesis was .05 and are presented in Table-I

variable was constant in case of every subject. The correlations might have been insignificant because of the independent calculation but they must have a cumulative effect on the performance.

The relationship of selected linear kinematic variables is at the moment contact with the performance of subjects in cover drive shots presented in table -II.

**Table 2:** Relationship of Selected Linear Kinematic Variables at Moment Contact with the Performance of Uttarakhand Under-19 Team in cover drive

S. No	Variables	Coefficient of Correlation "r"
1.	Height of Centre of Gravity (Moment contact)	-0.161

\*Significant at 0.05 Level

r .05 (10) = 0.576

The results in table II show that the values of Coefficient of Correlation in case of the selected Linear Kinematic variable (Height of Center of Gravity) with the Uttarakhand Under-19

team was found insignificant at the selected level of significance of 0.05. Since the required value of Coefficient of Correlation for 10 degree of freedom is 0.576 and the

obtained values of Coefficient of Correlation of selected variables less than the required value. This trend does not mean that Height of Center of Gravity does not play any important role in executing the Cover Drive but the low value of correlation must have been because of the small sample size and the low value of the Height of Center of Gravity at moment contact

### **Conclusions**

Within the limitations of the study following conclusions may be drawn: -

None of the selected Angular Kinematic variables that is Ankle Joint (Right and Left), Knee Joint (Right and Left), Shoulder Joint (Right and Left), Elbow Joint (Right and Left) and Wrist (Right and Left), and Hip Joint (Left and Right) showed significant relationship with the performance of Uttarakhand Under-19 team in Cover Drive.

In case of Linear A biomechanical (kinematic) variable that is height of center of gravity at moment contact have significant relationship with the performance of Cricket players in cover drive shots.

### **Recommendations**

The following recommendations are made:

1. The physical education teachers and coaches while preparing the training schedules of their trainees may use the results of the study.
2. Analyze cover drives taken from different range and positions may also in the similar way.
3. The study may be conducted on the players of higher levels.
4. The study may be conducted on different skills in Cricket.
5. The study may be conducted on other variables involving other skills.

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