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**Dr. Amarpreet Singh**

Assistant Professor, Department  
of Physical Education, Punjabi  
University Patiala, Punjab,  
India

**Kayjeet Singh**

Research Scholar, Department of  
Physical Education, Punjabi  
University Patiala, Punjab,  
India

## Relationship of selected kinematical variables of throwing technique in cricket with their performance

**Dr. Amarpreet Singh and Kayjeet Singh**

### Abstract

The purpose of the present study was to investigate the relationships between selected of kinematical variables of throwing technique in cricket with their performance. Total Two male cricket players were selected as a sample: Indian male cricket players who had represented at First-class cricket level were selected as a sample on the basis of performance in preceding competition. The age of both the subjects was ranged above 25 years. The kinematic variables were Angle of wrist joint, Angle of elbow joint, shoulder joint angle at the time of over-arm throwing technique and performance of cricket players. The Kinematic Analysis of Over-arm Throwing Technique mean, standard deviation and Karl Pearson's product moment coefficient correlation were employed with the help of statistical package of SPSS. The level of significance was set at 0.05. The outcome of the study shows that significant relationship with performance (.443, .478, .477,) of over-arm throwing technique in all variables.

**Keywords:** Kinematic, wrist angle, elbow angle, shoulder angle

### Introduction

Bowling, batting and fielding are three main fundamental skills in cricket. Push (something) with force through the air by a movement of the arm and hand is called throwing. A good run-out of the batsman is only possible through when the fielder will be use good throwing technique and accuracy. Throwing is a whole body activity that begins with energy generate from the large leg muscles and rotation of the hips, and progresses through segmental rotation of trunk and shoulder girdle. Over arm throwing motion is mostly watched as one of the basic motion along with walking, running and jumping. In sports, throwing is to the upper body limb what gait is to the lower limb. This study basically focuses on over-arm throwing skill of fielding in inner circle of the fielding area. In fact, fielding includes three phases; namely: 1) stop the ball, 2) pick-up the ball and 3) throw toward the target. Furthermore, the throwing technique can be classified into three groups: over arm, side arm, and under arm. Throwing is a fundamental movement skill that forms the basis of many games the development of this skill could be of dominant importance for some sportspersons. Not only suitable physical movements are required in ball throwing, but appropriate breathing also plays a most significant role. (Phillips, Elizabeth, Roberts, & Huang, 1983) [2].

A throw made with the arm moving above the shoulder line is called an over-arm throw/serve. Throwing in which at the instant of release the throw's trunk is tilted toward the non-throwing arm side of the body, and upper arm is pointing up to the right. Phases of over arm throwing: 1) fielding phase, 2) step phase, 3) cocking phase: stride foot contact to the instant of maximum shoulder external rotation, 4) acceleration phase: maximum external rotation to the instant of ball release and 5) follow through phase: from ball release until 500 milliseconds after the ball has been released. Subdivision of the throwing technique has enabled important variables of performance to be identified within each phase, in addition to an overview of technique in which the whole body can be seen to work in a coordinated fashion to achieve its goal. (Fleisig, 2010) [3].

The biomechanical study of throwing technique is the response to fulfill existential space, refinement, and adjustment of the game and sports in growing competitive sporting world to the changing demand at the international level of competition a minute variation may result in win or lose.

### Correspondence

**Dr. Amarpreet Singh**

Assistant Professor, Department  
of Physical Education, Punjabi  
University Patiala, Punjab,  
India

Each country is backing their sports person with biomechanical study about to achieve the need. Other developing countries have made their changes according to demand and thus supplanted Indian performance. Indian cricket player need support from our researchers to recognize variation and variables to navigate their performance to those golden days of dominating world cricket. (Husain & Bari, 2011)<sup>[1]</sup>.

**Statement of the problem**

The Problem entitled as “Relationship of Selected Kinematical Variables of Throwing Technique in Cricket with Their Performance”.

**Method and procedure**

**Selection of subjects**

Total Two male first-class cricket players were select as a sample for the study. The age of the both subjects was above 25 years. Data was collected on different places for each sample and two sessions of each player.

**Selection of variables**

- (WΦ) Angle of wrist joint at the time of over-arm throwing.
- (EΦ) Angle of elbow joint at the time of over-arm throwing.
- (SΦ) Angle of shoulder joint at the time of over-arm throwing.

**Criterion measure**

The criterion measure for this study was the performance of the over arm throwing technique in cricket. The standardized pitch distance (20.12 meter) from cover position to stumps was used for the study. Semi-new English leather balls and flexible stumps were used in this study. Total 50 trials were given to each player and the performance of each trial was recorded. The height of the camera was set at 1.29 meters. Digital video camera was placed 7.60 meter away at the side of the Thrower (lateral axis).

The selected biomechanical variables such as Angle of wrist joint at the time of throwing, Angle of elbow joint at the time of throwing, Angle of shoulder joint at the time of throwing at the time of throwing was analysed.

**Filming protocol**

Through Quintic coaching v-17 software motion capture technique was used in this study. To record the video of over-arm throwing technique in cricket, while performing the technique, digital video camera (50 fps) was used by a

professional photographer. After obtaining the recorded video, the video was analyzed through Quintic Coaching v-17 software approved by Human kinetics. First video was digitized through Quintic coaching v-17 software. After the procedure of digitizing, the video was calibrated. The calibrated video gave the results through makers, stroboscopic effect technique, stick figures, stopwatch programming, angle manual (horizontal, vertical, and draws angles), linear and angular analysis manual. Motion capture technique/Digital videography was used to analysis the selected kinematical variables of over arm throw in cricket for male players. Digital video camera CASIO EX-FH 100 (50 fps) was used for videography of over-arm throw for cricket player performance. The performance of the subjects was recorded with stroboscopic effect from approach to throw toward the target. Digital video camera was placed 7.60 meter away at the side of the Thrower (lateral axis). The height of the camera was set at 1.29 meters.

**Administration of the test**

Two male cricket players were purposive selected as sample from Patiala for the study. The standardized pitch distance (20.12 meter) from cover position to stumps was used for the study. Semi-new English leather balls and flexible stumps were used in this study. The separate data were collected as for both cricket players. All the selected subjects were asked to perform over arm throws with their full potential and accuracy technique. It was ascertained that subjects possess reasonable level of technique. The subjects were explained about the objective of the study. The entire selected player have readily agreed and volunteered to act as subject for the study. The selected subjects were initiated through concerned coaches, and later direct contacts were made. The coaches provided names of the potential players who will be free of any type of injury in the upper and lower extremities as well as psycho-physiological problems. Fifty (50) attempts were given to each player to perform over- arm throw. The data was collected at two sessions of each player. Digital video camera was placed 7.60 meter away at the side of the player (lateral axis). The height of the camera was set at 1.29 meter.

**Statistical procedure**

With regard to purpose of the study Karl Pearson’s Product Moment Coefficient Correlation statistical technique test was used with the help of SPSS software was calculate between selected kinematical variables with performance of male cricket players. In order to check the significance, level of significance was set at 0.05.

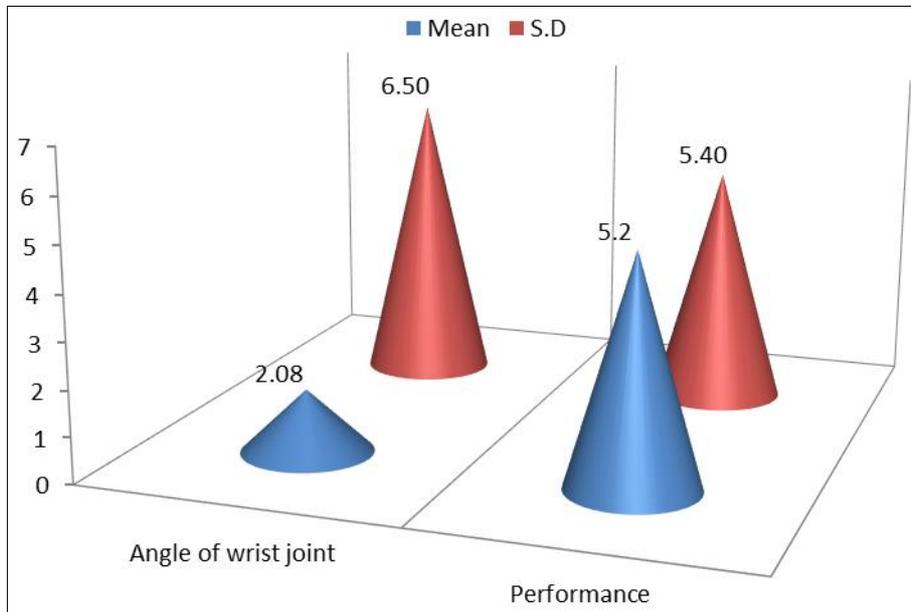
**Table 1:** Shows Relationship between Angle of Wrist Joint and Performance in Over-Arm Throwing technique in Cricket.

Trails	Variables	Mean	Standard deviation	Correlation (r) Value
100	Angle of wrist joint	2.08	6.50	.443*
100	Performance	5.2	5.40	

\*r<sub>0.05(90)</sub>= 0.205 \*Significant at .05 level of significance

Table & figure 1 shows that the Mean & S.D value of Angle of Wrist Joint of Cricket Players was 2.08 and ± 6.50 respectively. The tabulated value of 'r' is 0.205 whereas the calculated value of 'r' is 0.443, which is more than the

tabulated value. Hence, it moves that there is significant relationship between angle of Wrist Joint with the performance.



**Fig 1:** Shows the Mean and Standard Deviation values of Angle of Wrist Joint and Performance of Over-Arm Throwing technique.

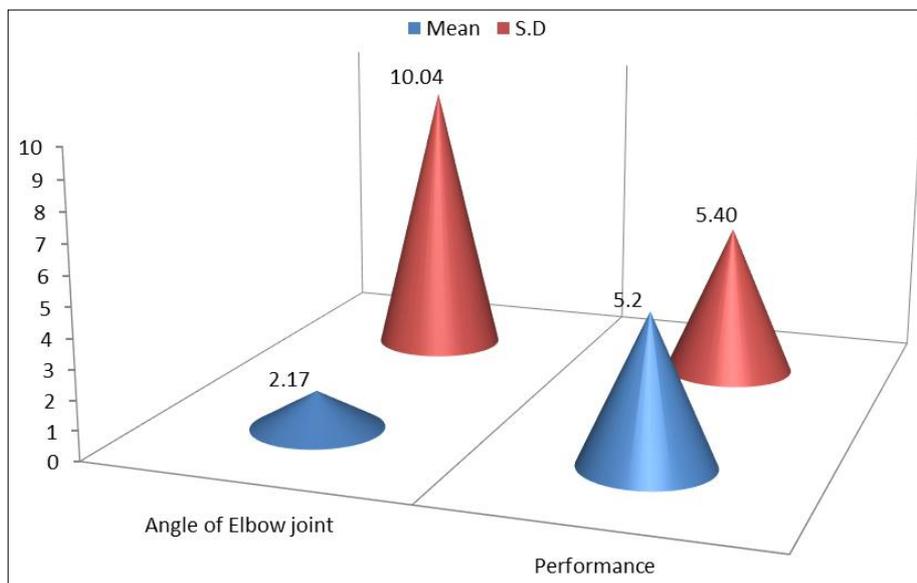
**Table 2:** Shows Relationship between Angle of Elbow Joint and Performance in Over-Arm Throwing technique in Cricket.

Trails	Variables	Mean	Standard deviation	Correlation (r) Value
100	Angle of Elbow joint	2.17	10.04	.478*
100	Performance	5.2	5.40	

\* $r_{0.05(90)} = 0.205$ . \*Significant at .05 level of significance

Table & figure 2 shows that the Mean & S.D value of Angle of Elbow Joint of Cricket Players was 2.17 and  $\pm 10.04$  respectively. The tabulated value of 'r' is 0.205 whereas the calculated value of 'r' is 0.478, which is more than the

tabulated value. Hence, it moves that there is significant relationship between angle of Elbow Joint with the performance.



**Fig 2:** Shows the Mean and Standard Deviation values of Angle of Elbow Joint with Performance of Over-Arm Throwing technique.

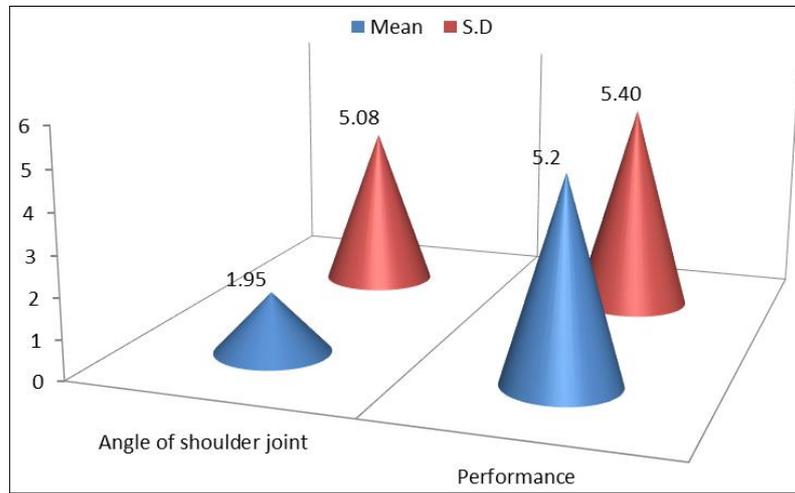
**Table 3:** Shows Relationship between Angle of Shoulder Joint and Performance in Over-Arm Throwing technique in cricket.

Trails	Variables	Mean	Standard deviation	Correlation (r) Value
100	Angle of Shoulder joint	1.95	5.08	.477*
100	Performance	5.2	5.40	

\* $r_{0.05(90)} = 0.205$  \*Significant at .05 level of significance

Table & figure 3 shows that the Mean & S.D value of Angle of Shoulder Joint of Cricket Players was 1.95 and  $\pm 5.08$  respectively. The tabulated value of 'r' is 0.205 whereas the calculated value of 'r' is 0.477, which is more than the

tabulated value. Hence, it moves that there is significant relationship between angle of Shoulder Joint with the performance.



**Fig 3:** Shows the Mean and Standard Deviation values of angle of Shoulder Joint and Performance of Over-Arm Throwing technique.

### Discussion of the Findings

The purpose of the study was to find out the relationship of selected cricket players of over-arm throwing technique with performance. The statistical analysis of the data was collected on two male first class levels of cricket players. Total 50 trials were given to each player and the performance of each trial was recorded. The height of the camera was set at 1.29 meters. Digital video camera was placed 7.60 meter away at the side of the Thrower (lateral axis).

- i. **Angle of Wrist joint:** The result of the study informs that there is significant relationship between Angle of Wrist Joint of Cricket Players with Performance. The findings are supported by Nathial, M.S. (2016). "Study of applied kinematical variables and the correlational performance in set shot".
- ii. **Angle of Elbow joint:** The result of the study informs that there is significant relationship between Angle of Elbow Joint of Cricket Players with Performance. The findings are supported by Kapur, A. & devi, S.K. (2017). "Release characteristic of shot put: A kinematic approach".
- iii. **Angle of Shoulder joint:** The result of the study informs that there is significant relationship between Angle of Shoulder Joint of Cricket Players with Performance. The findings are supported by Nathial, M.S. (2016). "Study of applied Kinematical variables and the correlational performance in set shot".

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