Research Paper Physical Education

# Relationship of Selected Kinematical Variableswith the Performance of Female Basketball Players in Lay- Up Shot.

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**ABSTRACT**

Aim:The study was concluded in order to determine the relationship between selected biomechanical variables with the performance of Lay-up shots. Subjects:Tenfemale basketball players who representC.S.J.M. University, Kanpur, were selected as subjected for the study.Method: The help of digital videography was used to film the subjects is sagital plane of Lay-up shot. Joint point method was used in order to obtain the values of selected angular kinematics variables from develop stick figures. The performance in Lay-up shot was recorded by the scores in Lay-up shot, which was obtained by using three point scales by the three judges.Statistics:To determine the degree of relationship between selected kinematic variables with the performance in Lay-up shot Pearson's product Moment Correlation Method was used.Result: The results have shown the insignificant values of coefficient of correlation in case of all the selected kinematic variables. AcceptIn case of Knee joint (right). Conclusion:This may be attributed to the fact that the angles at different joints mentioned in this study such as Knee joint, Ankle joint, Hip joint, Shoulder joint, Elbow joint, Wrist joint. Change from one individual to another according to his Anthropometric measurement. i.e. his height, leg length, arm length

**KEYWORDS** | Sagital plane, Kinematic, Lay-up shot

**INTRODUCTION**

Biomechanics may be defined as the science, which investigates the internal and external forces acting on a human body and the effects produced by these forces. In the last several decades, biomechanics has demonstrated considerable growth evolving from an exercise in the filming of human movement to an applied science with a powerful array of measurement and modeling techniques. The simple descriptive approach which was characteristic of early work has been superseded by attempts to explain the mechanisms underlying movement. Consequently, biomechanics has emerged as an important area of scientific investigation in a variety of disciplines. Included among these are automobile safety, biomedical engineering, ergonomics, exercise science, orthopedic surgery, physical rehabilitation, and sport (Hay).

The role that sports biomechanics can play is becoming more widely understood in sports community and the demand for service increasing, researchers in sports biomechanics will have to consider carefully how much time they can devote to the provision of scientific services without impairing their performance as scholar researchers. To avoid the problems inherent in this situation, it may be necessary to develop programmes of study for the training of techniques in sports biomechanics, technicians who can provide the kind of services sought by sporting bodies.

A Kinematics assessment is providing information on the relationship of parts of the body to each other. This is useful in measuring joint angles during complex movement and has provided the basis of understanding functional activities comes from kinematics assessments

Siliconcoach Pro 07 is siliconcoach's premier software and the result of 15 years working with our clients around the globe. Siliconcoach Pro is designed for analyzing movement and providing feedback by combining the processes of capture, watch and review, and analyse. Visual feedback greatly enhances understanding rather than just verbally describing movements you can visually show them.

In basketball shooting is one of the primary skills of the game and requires a great deal of practice assisted by good models, scientifically based. Since players were accepted to shoot often in order to score. They developed a variety of shots, which includes the hook shot, the jump shot, the set shots and the lay-up shot

**Objective:**

The purpose of this study was to measure the relationship of selected kinematical variable to the performance in lay-up shot.

**Methodology**

The study was delimited to female basketball players of C.S. J.M. University, Kanpur. The study was further delimited to the10 subject belonging to the age group 17 to 28 years. The subjects were only right handed shooters.

The scores of the subjects in Lay-up shot were used as the criterion variable in the study. The performances of the subjects were assessed by three judges however elements related to the accuracy of shooting were also added. Used in three-point scale. Three point awarded in correct action and basket scored. Two points awarded in correct action but not scored. One point awarded in touches the ring or board.

Siliconcoach pro 7 software was used for kinematical analysis of Lay-up shot in basketball. A Casio Exilim F-1 High Speed Camera, which was positioned at 7.90m from the subject at an height of 1.50m. from the subject on an extension of free throw line. Camera was also set for capturing 300 fps. The subjects were made to take three Shots only. The angular kinematical variables of the body were calculated at moment execution.

The videos as obtained by the use of digital videography were analyzed (the best trial) by siliconcoach pro 7 software. Only one selected frame was analyzed. Selected variables were as under. Were represented by the angles at selected joints as Ankle joint, Knee joint, Hip joint, Shoulder joint, Elbow joint, Wrist joint and Body inclination. Other variables were height of release, last stride, arm span and Standing Height of Player.




**Fig.1-During Take-Off**




**Fig.2- During ball Release**

**Hypothesis**

It is hypothesized that there would be no significant relationship between angular kinematic variables and the performance in Basketball.

The data was analyzed by use of person's product moment correlation. The level of significance chosen to test the hypothesis was 0.05. The above statistical technique was analyzed by using SPSS version 15.

**Results**

**Table -1**
**Relationship of Selected Angular Kinematical Variables at Movement Release with the Performance of Subjects in Lay- Up Shot**
**(N=10)**

| S.No. | Variables | Coefficient of Correlation (r) |
|---|---|---|
| 1. | Ankle Joint (Right) | 0.214 |
| 2. | Knee Joint (Right) | 0.650* |
| 3. | Hip Joint (Right) | 0.452 |
| 4 | Shoulder Joint (Right) | 0.543 |
| 5 | Elbow Joint (Right) | 0.588 |
| 6 | Wrist Joint (Right) | 0.119 |
| 7 | Body Inclination | -0.302 |

* Significant at .05 level

r.05 (8) = .632

As shown in table -I that the value of coefficient of correlation. In case of Ankle joint (right), Shoulder joint(right), Elbow joint (right) Hip joint,and Wrist joint (right) showed insignificant, but Elbow joint are very closed to the significant and incase of Knee joint(right) showed significant relationship with the performance of coefficient of correlation for 8 degree of freedom is 0.632 and the other obtained value of coefficient of correlation of selected variables are less then the required value.

**Table -2**
**Relationship of Selected Linear Kinematical Variables at Movement Release with the Performance of Subjects in Lay- Up Shot**
**(N=10)**

| S.N. | Variables | Coefficient of Correlation (r) |
|---|---|---|
| 1. | Height of Release | -0.393 |
| 2 | Length of Last stride | 0.394 |
| 3 | Arm Span | 0.450 |
| 4 | Standing Height of Player | 0.218 |

* Significant at .05 level

r.05 (8) = .632

Table - 2 clearly indicates that there exists an insignificant relationship between lay-up shot performance andHeight of Release, Length of Last stride, Arm Span and Standing Height of Playeras the correlation co-efficient values were found lower than the tabulated values at .05 level of significance.

**Discussion**

In case of Ankle joint (right), shoulder joint (right), Elbow joint (right) Wrist joint (right) and Hip joint (right) showed insignificant, but Elbow joint are very closed to the significant and incase of knee joint (right), showed significant relationship with the performance of subjects in Lay- up shot. Since the researcher has calculated the relationship individually.

This might be done that the angle of right knee joint was more accurate or perfect rather than the other joints of the body. It becomes significant because the player use to jump to the maximum height at moment execution because lay-up shot depends upon the jump of the player and height of the player, plays a very important role in jump.

The performance of lay up also depends upon the muscular strength of an individual. The explosive strenght is the factor that can determine as the major cause which increases the performance capacity of the player . It is also very helpful for a palyer to reach his / her maximum height.

It is also found that theother factors can also influence the performance in lay up shot like, motivation level, their previous learned skill, their used technique, the environmental condition, physiological and psycholgocal condition.

This may be attributed to the fact that the angles at different joints mentioned in this study such as Knee joint, Ankle joint, Hip joint, Shoulder joint, Elbow joint, Wrist joint. Change from one individual to another according to his Anthropometric measurement. i.e. his height, leg length, arm length.

The accurate Lay- up shot depends upon the physical fitness of the player, velocity of the ball, take off and height of release. For the accuracy converting into the basket, releasing of ball is also determine.

**Discussion of Hypothesis**

The hypothesis stated earlier that there would be no significance relationship between linear and angular kinematic variables and the performance in lay-up shot were partially accepted and partially rejected.

**Conclusion**

**1.** In case of Ankle joint (right), Shoulder joint(right), Elbow joint (right), Wrist joint (right),Hip joint and body inclination showed insignificant and incase ofKnee joint(right) showed significant relationship with the performance of subjects in lay- up shot.

**2.** In case of Linear kinematic variables does not have significant relationship with the performance of basketball players in lay- up shot.

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