



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 4.69
IJPESH 2016; 3(1): 232-234
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www.kheljournal.com
Received: 13-11-2015
Accepted: 14-12-2015

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Relationship of selected kinematic variables with the performance of basketball players in layup shot

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Abstract

The purpose of this study was to measure the relationship of selected biomechanical variables to the performance in Lay-up shot. The subjects for this study were ten male basketball players of Dept. of Physical Education, Ch. Charan Singh University Meerut, who represented Ch. Charan Singh University Meerut in Intervarsity Championship. The age ranged from eighteen to twenty two years. All the subjects were right handed shooters. 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 basketball players in lay-up shot. In case of linear kinematic variables that is height of center of gravity at moment release does not have significant relationship with the performance of basketball players in lay-up shot.

Keywords: Kinematic variables, basketball players, layup shot

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 days 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. Basketball has been called the international sport of the 1980s. There is hardly a corner of the earth where people of all ages and both sex have not been attracted by this game of fast movement, amazing accuracy and thrilling, sometime, extraordinary finishes. As we know basketball was born in the United States in 1891 as a recreational activity and quickly spread, culminating in its debut at the Olympic Games in 1936 as men's sports.

Basketball is a game of intricate movement combined with great speed and accuracy. The meshing of fundamentally sound players weaving clever patterns of attack and defense develops great teams. The spectator realizes this subconsciously but in many cases cannot recognize it. Shooting which is an evaluation of passing will follow and give the greatest satisfaction in execution. It makes little difference how well a team defends dribbles, passes to work the ball into a scoring position if the players cannot shoot.

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 expected to shoot often in order to score. They developed a variety of shots, which include the hook shot, the jump shot, the set shot and lay-up shot.

Biomechanics and Lay up Shot practices described by some of the authors are as follows: -

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Biomechanics

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 Biomechanical variables were represented by the selected angles of the various joints of human body and height of center of gravity at moment release.

Lay-up Shot

In lay-up shot the player runs while dribbling the ball with his right hand then places his right foot followed by left foot then he takes off and releases the ball underhand towards the basket by raising his shooting hand fully.

Methodology

The subjects for this study were ten male basketball players of Dept. of Physical Education, Ch. Charan Singh University Meerut, who represented Ch. Charan Singh University Meerut in Intervarsity Championship. The age ranged from eighteen to twenty two years. All the subjects were right handed shooters. 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 Variables were:

1. Height of Center of Gravity at moment release.

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

- i. Ankle joints
- ii. Knee joints
- iii. Hip joints
- iv. Shoulder joints
- v. Elbow joints
- vi. 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-1.

Table 1: Relationship of selected angular kinematic variables at moment release with the performance of subjects in lay-up shot (n = 10)

S. No.	Variables	Coefficient of Correlation "r"
1.	Ankle Joint (Left)	0.582
2.	Ankle Joint (Right)	-0.126
3.	Knee Joint (Left)	0.407
4.	Knee Joint (Right)	0.005
5.	Hip Joint (Left)	0.622
6.	Hip Joint (Right)	0.583
7.	Shoulder Joint (Left)	-0.472
8.	Shoulder Joint (Right)	-0.074
9.	Elbow Joint (Left)	-0.002
10.	Elbow Joint (Right)	-0.081
11.	Wrist Joint (Left)	0.00
12.	Wrist Joint (Right)	0.225

As shown in Table-I that the values of coefficient of correlation incase of all the selected kinematic variables were found insignificant at the selected level of significance of 0.05. Since the required value of coefficient of correlation for 8 degree of freedom is 0.632 and the obtained values of coefficient of correlation of selected variables less than the required value. The relationship of selected linear kinematic variables is at the moment release with the performance of subjects in lay-up shots presented in table -2.

Table 2: Relationship of selected linear kinematic variables at Selected moment with the performance of The subjects in lay-up shots

S. No.	Variables	Coefficient of Correlation
1.	Height of Center of Gravity (Moment Release)	-0.167

The results in table II show that height of center of gravity at the selected moment has shown insignificant negative relationship with the performance of subjects in lay-up shots.

Conclusions

Within the limitations of the study following conclusions may be drawn.

1. 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 basketball players in lay-up shot.
2. Incase of linear kinematic variables that is height of center of gravity at moment release does not have significant relationship with the performance of basketball players in lay-up shot.

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