



ISSN: 2456-0057

IJPNPE 2018; 3(2): 1223-1226

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www.journalofsports.com

Received: 25-05-2018

Accepted: 27-06-2018

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Relationship of selected biomechanical variables with performance of jump shot in basketball

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Abstract

The purpose of the study was to find out the relationship of selected biomechanical variables with performance of jump shot in basketball. For the purpose of the study ten right handed male basketball players of all India inter university level from Punjabi university Patiala was selected as subjects for the study the age of the subjects were between 18-25 years and the height of the player 5'10" to 6'01". Total of ten attempts were given to each subject and the successful shots marked as score out of two. The performance of each trial was judged accurately and total score was recorded. Camera was placed right side of the player and the distance between the camera to the ring was 7.30 meter & the height of the camera was 1.45 meter. Selected biomechanical variables Projection angle of the ball, Linear distance cover by ball, linear velocity of the ball, Horizontal velocity of the ball and linear acceleration of the ball was measured through cinematography technique with the help of software (quintic coaching 4.01 v17). With regard to purpose of the study Karl Pearson's product moment coefficient correlation statistical technique was calculated between selected kinematical variables with the performance of subjects in jump shot in basketball. In order to check the significance, level of significance was set at 0.01. On the basis of analysis the data result shows that there was no significant relationship exist between the projection angle of the ball, linear distance cover by ball and linear velocity of the ball jump shot in basketball with performance and the Horizontal velocity of the ball & Linear Acceleration of the ball jump shot in basketball have significant relationship with performance.

Keywords: Cyclist, cycling speed, core strength

Introduction

Basketball is a popular sport in the world. Not only a complete organization, but also technical needs, tactic, agreement, experience and the potential for contest is shown in a game (Chiou, 2001) [12]. The ratio of aerobic to anaerobic in basketball is 1:9; this shows that basketball is an anaerobic and high intensity exercise (Lin, 1997). Because of the high intensity and anaerobic property of basketball, one has to perform the players' best performance within the short period of the game. Biomechanics is often applied to basketball to define the characteristics of skills, to gain an understanding of their mechanical effectiveness and to identify factors essential for optimal performance. There is limited research on the biomechanical aspects of shooting in basketball and identification of kinematic variable differences that may play a critical role in technical and tactical training of aspiring young basketball players. The majority of kinematic data reported in the earlier literature has been analyzed using two-dimensional, sagittal plane methodologies. Few three-dimensional studies have been conducted. There are many different biomechanical principals that contribute to the effectiveness of a jump shot in terms of its accuracy and power. Many other biomechanical variables like that body angles, linear velocity, horizontal velocity, linear acceleration etc. also affect the performance of jump shot in basketball. The purpose of the study was to find out the Relationship of Selected Biomechanical Variables with Performance of Jump Shot in Basketball.

Methodology

Ten right handed male basketball players of all India inter university level from Punjabi university Patiala was selected as subjects for the study the age of the subjects were between 18-25 years. Total of ten attempts were given to each subject and the successful shots marked as score out of two.

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coefficient correlation statistical technique was calculated between selected kinematical variables with the performance of subjects in jump shot in basketball. In order to check the significance, level of significance was set at 0.01.

Result and Discussion

The statistical analyses pertaining to the Karl Pearson's product moment coefficient correlation for biomechanical variables are presented in table 1 to 5.

Table 1: The Relationship between the Projection Angle of the ball jump shot in basketball with performance.

Trails	Variables	Mean	SD	Correlation Values
100	Projection angle of the ball	55.9861	2.743308	0.200944
	Performance	1.02	1.004837	

$r_{.01} (98) = 0.242$

Table-1 shows that there was no significant relationships exist between the Projection angle of the ball jump shot in basketball with performance.

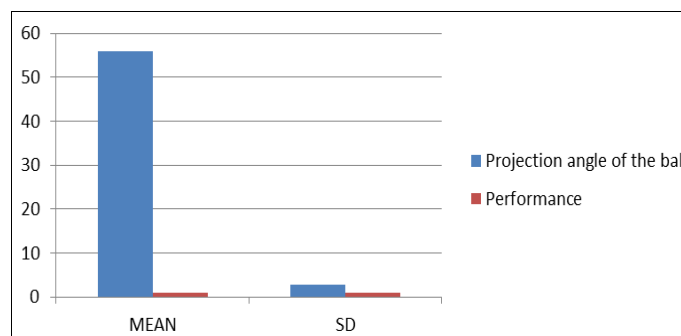


Fig 1: The Relationship between the Projection Angle of the ball jump shot in basketball with performance.

Table 2: The Relationship between the Linear distance cover by ball jump shot in basketball with performance.

Trails	Variables	Mean	SD	Correlation Values
100	Linear distance cover by ball	4.844264	0.685238	0.015771
	Performance	1.02	1.004837	

$r_{.01} (98) = 0.242$

Table-2 shows that there was no significant relationships exist between the linear distance cover by ball jump shot in basketball with performance.

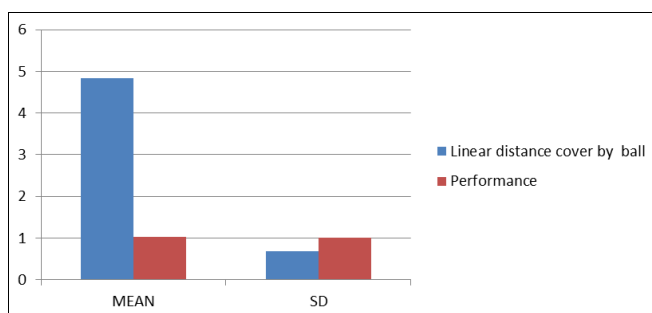


Fig 2: The Relationship between the Linear distance cover by ball jump shot in basketball with performance.

Table-3 shows that there was no significant relationship exist between the Linear velocity of the ball jump shot in basketball with performance.

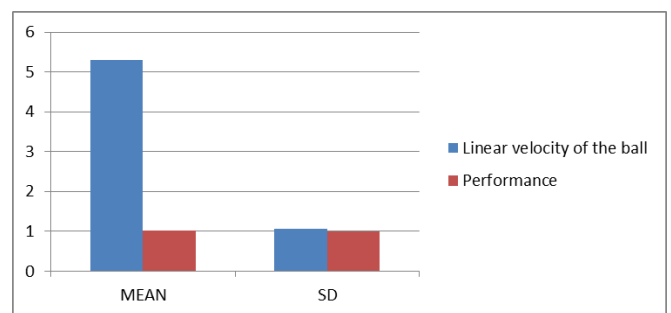


Fig 3: The Relationship between the Linear velocity of the ball jump shot in basketball with performance.

Table 3: The Relationship between the linear velocity of the ball jump shot in basketball with performance.

Trails	Variables	Mean	SD	Correlation Values
100	Linear velocity of the ball	5.307492	1.060253	0.203505
	Performance	1.02	1.004837	

$r_{.01} (98) = 0.242$

Table 4: The Relationship between the Horizontal velocity of the ball jump shot in basketball with performance.

Trails	Variables	Mean	Sd	Correlation Values
100	Horizontal velocity of the ball	4.08275	0.708038	0.442274
	Performance	1.02	1.004837	

$r_{.01} (98) = 0.242$

Table-4 shows that there was significant relationship exist between the Horizontal velocity of the ball jump shot in basketball with performance.

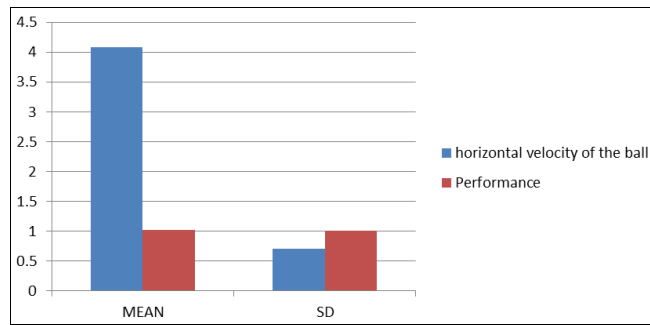


Fig 4: The Relationship between the Horizontal velocity of the ball jump shot in basketball with performance.

Table 5: The Relationship between the Linear Acceleration of the ball jump shot in basketball with performance.

TRAILS	VARIABLES	MEAN	SD	Correlation Values
100	Linear Acceleration of the ball	1.166204	8.056808	0.481826
	Performance	1.02	1.004837	

$r_{.01} (98) = 0.242$

Table-5. Shows that there was significant relationship exist between the Linear Acceleration of the ball jump shot in basketball with performance.

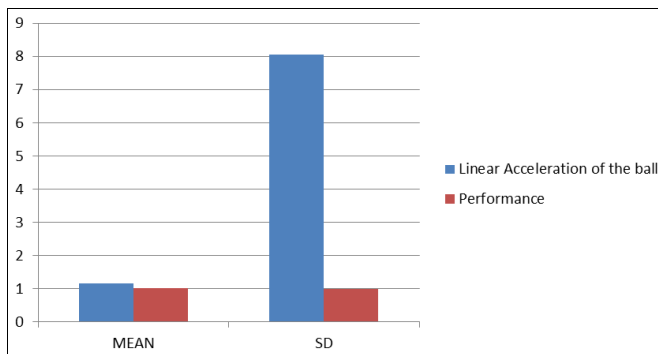


Fig 5: The Relationship between the Linear Acceleration of the ball jump shot in basketball with performance.

Conclusion

On the basis of analysis the data, the following conclusions may be drawn

There was no significant relationship exist between the projection angle of the ball, linear distance cover by ball and linear velocity of the ball jump shot in basketball with performance and the Horizontal velocity of the ball & Linear Acceleration of the ball jump shot in basketball have significant relationship with performance.

Recommendations

- Similar Studies can also be conducted on female basketball players.
- The study may be undertaken with large number of variables like equilibrium, momentum,
- Centre of gravity as the factors contributing to performance.
- Similar study may be conducted by using more sophisticated equipments of different level.
- This study can be conducted on national and international teams.

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