A Comparative Study of Selected Kinematic Variables among Different Heights in Basketball

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Abstract

The purpose of the present study was to compare the selected kinematic variables between short height and medium height Basketball players. Ten (N=10) Basketball player of Basketball academy from NBA Academy Indore were purposively selected as a subject for present study. Further it was divided into two different heighted groups of five (N=5) subjects each, first group was heighted from 155 to 165 cm and the second group was heighted from 166 to 175 cm respectively. All subject ranged between the ages 15 to 21 years. Videography method was used to biomechanically analysis the selected moments i.e. execution of jump shot in Basketball. The selected linear kinematic variables such as Height of Release of Ball and Centre of Gravity were selected for the present study. Kenova software was used in order to obtain the values of selected linear kinematic from developed stick figure. For the purpose of this study independent 't' test was used. The level of significance was set at 0.05. The result revealed significant difference in selected linear kinematic variables between short heighted and medium heighted Basketball players.

KEYWORDS: Basketball, Videography, Biomechanical, Centre of Gravity, kinematic

Introduction

Biomechanics of human movement can be defined as the interdisciplinary which describes, analyzes, and assesses human movement. The term used for these descriptions of human movement is kinematics. Kinematics is not concerned with the forces, either internal or external, that cause the movement, but rather with the details of the movement itself. A complete and accurate quantitative description of the simplest movement requires a huge volume of data and a large number of calculations, resulting in an enormous number of graphic plots. (Winter, 2005). Basketball is one of the most popular sports in the world. Participants of all ages have discovered Basketball to be fun, competitive educational, recreational, and fitness oriented. Individual skills such as shooting passing, dribbling, and rebounding, along with offensive and defensive teamwork, are prerequisites for successful participation in the sport.(Oliver, 2004).The jump shot is a shot executed by the player after getting ground force from the ground and release the ball from certain height.

Methodology

Ten (N=10) Basketball player of Basketball Academy from NBA Academy Indore are purposively selected as a subject for present study. Further it was divided into two different heighted groups of five (N=5) subjects each, the first group was heighted from 155 to 165 cm and the second group was heighted from 166 to 175 cm respectively. All subjects ranged between the ages 15 to 21 years and were right handed Basketball shooter. The purpose of the research was explained to all subjects and subjects were motivated to put their best during each trial.The research scholar familiarized subjects

with the testing equipment and procedures and following linear kinematic variables were selected-I Height of Release of Ball and Center of Gravity.

Criterion measures

For the purpose of present study, the angles at selected joints were recorded to the nearest degree. Videography method was used to biomechanically analysis the selected moments i.e. execution of jump shot in Basketball. Canon EOS 6D Mark II Camera with the frequency of 60 frames per second was placed on the sagital plane. The distance of camera from the subjects performing area was 6.33 meters away and the height of the lens was 1.4 meters from the ground. Kinovea software was used to measure the linear kinematic variables developed by stick figures. To compare the selected linear kinematic variables between short heighted and medium heighted Basketball players independent t test was used.

Results

TABLE 1

T-TABLE OF THE VARIABLE WITH F VALUE FOR LEVENE'S TEST

Groups	Means	S.D.	MD	SE of mean diff	t value	p value	F value	p value
Height of ball release- Short heighted Medium heighted	154.13 181.11	15.71 6.9	-26.97	7.67	-3.51	0.008	6.26	0.057
Centre of gravity- Short heighted Medium heighted	94.58 107.22	8.365 .19	-12.64	4.40	-2.87	0.021	1.59	0.24

*significant at 0.05 level

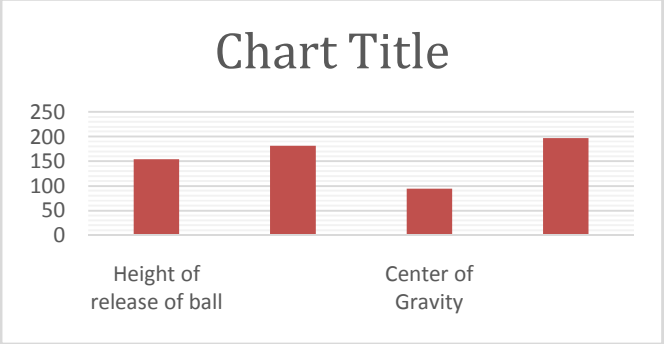

FIGURE 1: MEAN VALUES OF LINEAR KINEMATIC VARIABLES BETWEEN SHORT HEIGHTED AND MEDIUM HIEGHTED BASKETBALL PLAYERS

The following Interpretation can be done on the basis of result shown in table the mean height of ball release in Short heighted player is 154.13 cm and for the medium heighted player is 181.11 cm whereas the standard deviation in ball release for short heighted player is 15.71 whereas for medium heighted player is 6.9 cm. In case of center of gravity the mean of short heighted player is 94.58 cm and the mean of medium heighted player is 107.22 cm. whereas standard height for short heighted player is 8.36 cm and for medium heighted player is 5.19 cm

Discussion of Findings

One of the assumption of Independent t test is that variance of two groups must be equal to check the variance of equality Levine's test was used. In above table researchers found in Levine's test F-value for height of release was 6.26 which is greater than 0.05 level of significance therefore the null hypothesis may be accepted hence researchers confirmed that there is an equality of variance between the groups and the p value for height of release is 0.008 which is less than 0.05 hence researcher may reject the null hypothesis same way for the height of center of gravity the Levine's test F value is 1.56 which is more than 0.05 where the researchers full fill the assumption of equality of variance. The independent t test p value of center of gravity is 0.021 which is less than 0.05 where researcher reject the null hypothesis.

Conclusion

The present study concludes that there is a significant difference in Height of Release of the ball and center of Gravity between short heighted and medium heighted Basketball players. The finding of the study suggest that to have the good Basketball playing ability one should have good height where the player can get the maximum biomechanical advantage as the basket has to convert in certain height.

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