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A study of Selected Angular Kinematic Variables on the Long Jump Performance

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ABSTRACT

The purpose of the study was to determine the link between the Angular Kinematic variables of long jump performance and the most important Angular Kinematic variable for improving long jump performance. Long jump performance demands skill, strength, and quickness. The objective is to cover the maximum horizontal distance from the takeoff point to where the athlete land in the sandpit. For the purpose of this study, the 10 (Ten) male elite Long Jumpers of 18 to 25 years of age group were taken from Lakshmibai National Institute of Physical Education, Gwalior. The study also used the multiple - correlation statistical technique for the analysis of the data. The result of the study shows that out of all the angular kinematic variables chosen for the study, only one variable i.e. take-off angle was found to be significant as their P value was less than 0.05.

Introduction

The Greek word "ATHLON," which meaning a contest, is where the word "athlete" originates. The sport was invented and included in the Olympics because it was thought that fighters needed to nimble and able to dodge obstacles like leaping across ditches or streams. Ellery Clark, who leaped 6.35 meters to earn the first gold medal in the modern Olympics, won the inaugural long jump gold medal in 1896. An athlete is someone who participates in a physical contest.Running and jumping are two

examples of rapid saltatoric motions that alternate between aerial and contact phases. The force generated at the end of each contact phase cancels out the vertical momentum(Seyfarth, Friedrichs, & Blickhan, 1999). Long jump performance will improve as the approach run and take-off become reliable and technically sound. The area of biomechanics known as kinematics is dedicated to the description of body motion. Kinematicsis the study of how far, how quickly, and how consistently a body moves. The study also focus on the performance of the long jump by analyzing the technique such as center of gravity in various phases and velocity of the athlete during the execution. The purpose of the study was to find out that which variable could the most correlated to the performance. The athletes' distance is determined by measuring how close the point of sand that they disrupted with their body was to a set line.

Material

The study is conducted on 10 subjects and all the data were gathered using trained officials. The athlete distance and speed were measured in meters per second and degree, respectively, and the angles were measured to the closest point. The program Kinovea software was used to measure the center of gravity.

Figure 1: Ankle Angle, Knee Angle, hip Angle, Shoulder Angle, Elbow Angle, at Moment Execution Phase in Long jump using the feature in Kinovea software.

Method

For the study 10 male Long Jump athletes who participate in intervarsity 18 to 25 years of age group. The selection of sample the purposive technique was used for the purpose of the study.

Results

Correlation coefficient statistic technique was used to find out the significant relationship between the selected kinematics variables at level of 0.05.

In angular kinematic variables results indicated that there was no significant correlation between ankle angle, knee angle, hip angle, shoulder angle, elbow angle and long jump performance. Only the take-off angle variable was found to have significant correlation to the long jump performance with correlation value of 0.752 and p value less than 0.05.

Table 1

DESCRIPTIVE STATISTICS OF ANGULAR KINEMATIC VARIABLES AND LONG JUMP PERFORMANCE

	Mean	Std. Deviation	N
Take off angle	59.3520	3.15747	10

Ankle angle	123.6260	9.83882	10
Knee angle	172.7620	8.34268	10
Hip angle	162.0820	12.12438	10
Shoulder angle	50.6110	10.53792	10
Elbow angle	159.5380	21.30805	10
Long jump performance	5.8710	.27950	10

Table 1 shows the descriptive values of all the selected independent variables. The mean and standard deviation are shown in the above table.

Table 2

COEFFICIENT OF CORRELATION(r) OF SELECTED ANGULAR KINEMATIC VARIABLES WITH THE LONG JUMP PERFORMANCE OF PLAYERS.

	Correlation	**Sig**
Take off Angle	**.752**	**.012**
Ankle angle	-.101	.781
Knee angle	-.262	.465
Hip angle	.513	.130
Shoulder angle	-.480	.160
Elbow angle	.401	.251

Table 2 indicates the correlation coefficient (r) of all the selected angular kinematic variables with long jump performance.

Results of this study indicated that there was significant correlation between take off angle and the performance of long jump. The coefficient correlation(r) was **.752** which found to be significant because the ($p<0.05$). The correlation between take-off angle and the long jump performance was positive. The other variables such as Ankle angle, Knee angle, Hip angle, Shoulder angle and Elbow angle were not found significant because their coefficient correlation significance value is greater than 5% ($p>0.05$).

Discussion and Finding

The objective of this study was to investigate the relationship between angular kinematic variables with the performance of hang style technique in long jump.

Results of this study indicated that there was significant correlation between take-off angle and long jump performance. The coefficient correlation(r) was .752 and it was significant ($p<0.05$). The above result was also supported by the finding of the study done by **Masaki & Nicholas** who identified that take-off angle had a significant impact on the flight distance.

Other angular kinematic variables such as ankle angle, knee angle, hip angle, shoulder angle and elbow angle were found to be insignificant as their p value was greater than 0.05.

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