



## ANALYSIS OF LEG FORCE OF THE HIGH JUMPER IN FOSBURY FLOP TECHNIQUE

### KEYWORDS

Leg Force, High Jump Performance, Fosbury Flop Technique

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### ABSTRACT

The purpose of this study was to analysis of Leg Force of the high jumper in Fosbury Flop technique. The study was conducted only ten (N=10) high jumper who were randomly selected from various Colleges of Madurai Kamaraj University, Madurai, Tamil Nadu, India during 2016-2017. The age of the subjects were ranged between 18 to 21. Among the various bio-mechanical parameters Leg Force only selected as dependent variable and it was calculated by using a formula. High jump performance was assessed through maximum jumping height in the competition. Zero order correlation technique was used to find out the relationship between jumping performance and Leg Force. The results of the study showed there is a positive relationship between high jump performance and Leg Force of the jumper.

### INTRODUCTION

The biomechanical analysis of different events can help understand the critical point of technical performance; thus helping coaches and athletes in their preparation. One area of major concentration over the past few years is that of biomechanical analysis. Human motion analysis is frequently used today for both clinical and research application the art and science of motion analysis has expanded beyond basic descriptions of ambulatory patterns to include front line clinical roles in rehabilitation, surgery, prosthetics, orthotics, Ergonomics and Athletics.

Biomechanics can be defined as 'the science that examines forces acting upon and within a biological structure and effects produced by such forces'. The 'biological structure' in this context can be wide spread and covers systems of different levels: cells, tissue, joints, segments, the entire body or even a complex system consisting of several bodies or the human body in combination with the surroundings (water, air, equipment, floor etc.). The main focus of applied sport biomechanics research is primarily directed to the entire human body in the complex sport discipline or sport specific situation.

Bio-mechanics provided the basis, the only sound logical basis upon which physical education can evaluate the techniques brought to our attention by champions.

Force is defined as that quantity that tends to change the velocity (to accelerate) an object (*Burstein and Wright 1994*).

It is the effect that one exerts before without motion but no motion without force. The manner in which force is applied to a body determines the way in which the body acts. Force is a function of the square of the velocity of an object or member of the body.

The high jump consists of sequence of movements aimed at clearing a vertical obstacle (*Authors Guide, 1993*). The primary goal in high jumping is, of course to get the body to great vertical heights as possible in order to clear a bar. This height depends on three factors. First, the jumper must develop as much lifting power is possible in order to project the body into the air with the greatest possible initial velocity. The height to which the body will raise is directly related to the velocity which it leaves the ground, secondly the angle of take-off must be sufficient to carry the body from one side of the bar to the other. Thirdly, the distance to which the centre of gravity may be raised is limited (*Bunn, 1955*).

### METHODOLOGY

For this study Ten (N=10) men high jump who have participated Madurai Kamaraj University intercollegiate athletic meet during the year 2016-2017 were selected as subjects. Among various bio-mechanical variables, Leg Force only selected as dependent variable.

### Procedure for Calculating the Leg Force of the Jumper:-

The take-off force by the athlete was calculated using the formula.  
Force = ma

Where:

F= Force exerted by the athlete

m= mass of the athlete

a= acceleration

The dependent variable was high jump performance which was assessed through maximum vertical height cleared in the competition. Person's products moments correlation (zero order) was used to find out the relationship of selected anthropometrics and physical fitness variable with Basketball performance. The level of significance was set at 0.05. SPSS package was used for statistical analysis.

### RESULTS & DISCUSSION

#### Table-1

#### Coefficients of Leg Force with High Jump Performance

SI No	Variables	Co-efficient of Correlation
1	Leg Force and High Jump Performance	0.95*

\*Significant at .05 level \* 0.05 (8) = 0.835

Table-1 had shown the relationship of selected Leg Force with High Jump performance. All the obtained correlation values were above the table value of 0.95. In this analysis Leg Force was significant relationship with high jump performance.

### CONCLUSION

From the above results and discussions the following conclusions were drawn

The results of the showed, that there is a significant relationship between Leg force and High Jump performance.

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