

A COMPARATIVE BIOMECHANICAL ANALYSIS OF THREE DIFFERENT BADMINTON FOREHAND OVERHEAD SHOT

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ABSTRACT

The purpose of the study was to find out whether there is any differences of Badminton Forehand shot. Badminton is one of the most popular racket sports in the World. Many types of researches are going on around the globes for enhancement of performance of badminton Players. Only three forehand shot were taken in consideration namely Forehand Smash Clear and Drop. Two Biomechanical Investigation was done. For the investigation of the research total [N = 10] subjects were randomly selected from the group of 78 Badminton Players. The research was confined to only three variables that are Forehand Clear, Forehand Drop and Forehand Smash. Standard Badminton Court was used. Standard Racket, Non Feather shuttle cock, were used, Data were collected by using Go-pro Hero camera. Height of the Camera was 1.05 meter and the camera was kept in 3.20 meter away from performing area During the point of contact phase was analyzed. After extracting data from camera it was ut in Kinovea 0.8.27software which Developed Stick Figure. One way ANOVA was used as a statistical tools. Researchers able to find out differences among all the three variables.

Keywords: Badminton, Clear, Smash, Drop, Shuttle Velocity, Racket Velocity, Centre of mass ANOVA.

Introduction

Day by day Racket Games is gaining popularity in the world. Among all the racket games badminton one of the pioneer racket Sports. Badminton came into existence in the Olympic in 1992. It is believed to be one of the fastest racket sports. One of the Chinese player smashed the shuttle faster than the golf ball. To get high quality performance one must equipped with a well-planned training Methods (Brahm, 2010). To play Badminton Players demand high level of fitness which includes, speed, endurance, strength, Flexibility etc. To be a Professional player in Badminton once required very high level of training (Brahm, 2010). badminton Consist of Many strokes among them most popular strokes are forehand Clear, Forehand Smash and Forehand Drop. Forehand clear is the one of the most essential strokes where player executes shot from back boundary line of own court to End Line of opponent court where shuttle travels in certain trajectory

(Brahm, 2010). Forehand Drop shot is tricky stroke were the shuttle lands near the net in the front court. Drop shot is similar to smash difference is in velocity of the racket and Shuttle (Grice, 2009). Forehand Smash is the fastest strokes in Badminton games. Study of the living systems; science which is known as biomechanics (Knuson, 2007). The purposes of the study is to observe whether there is any difference in three different badminton Forehand Overhead Strokes.

Method

For the investigation of the research total [N = 10] subjects were randomly selected from the group of 78 Badminton Players. Players were studying in Lakshmbai National Institute of Physical Education Gwalior (M.P.). Players were at least participated in state level or Inter university badminton competition. Only male right handed players were selected. Random sampling technique was deployed.

Materials

Standard Badminton Court was used. Standard Racket, Feather shuttle cock, were used, Data were collected by using Go-pro Hero camera. Height of the Camera was 1.05 meter and the camera was kept in 3.20

meter away from performing area During the point of contact phase was analyzed. After extracting data from camera it was ut in Kinovea 0.8.27software which Developed Stick Figure. One way ANOVA was used as a statistical tools.

Table 1 ANOVA table for badminton Forehand shot

		Sum of Squares	df	Mean Square	F	Sig.
Racket Velocity	Between Groups	2768.202	2	1384.101	130.160	.000
	Within Groups	287.113	27	10.634		
	Total	3055.315	29			
Shuttle Velocity	Between Groups	7859.374	2	3929.687	157.254	.000
	Within Groups	674.713	27	24.989		
	Total	8534.087	29			
Center of Mass	Between Groups	1230.540	2	615.270	4.983	.014
	Within Groups	3333.755	27	123.472		
	Total	4564.295	29			

The F value of Racket Velocity in Table is significant as p-value (0.00) which is not greater than 0.005 thus the Null Hypothesis of no difference among the means of smash, Clear and Drop may be rejected at 5% level. The F value of Shuttle Velocity in Table is significant as p-value (0.00) which is not greater than 0.005 thus the Null Hypothesis

of no difference among the means of Smash, Clear and Drop may be rejected at 5% level. The F value of Centre of mass in Table is significant as p-value (0.14) which is not greater than 0.005 thus the Null Hypothesis of no difference among the means of Clear, Smash and Drop may be rejected at 5% level.

Table 2 Descriptive Statistics for Badminton Forehand Overhead Shot

	Variables	N	Mean	Standard Deviation
Racket Velocity	Smash	10	48.28	3.90
	Clear	10	35.04	2.24
	Drop	10	24.82	3.41
	Total	30	36.05	10.26
Shuttle velocity	Smash	10	64.49	5.99
	Clear	10	49.03	4.98
	Drop	10	25.15	3.77
	Total	30	46.22	17.15
Center of mass	Smash	10	137.20	9.55
	Clear	10	123.44	9.96
	Drop	10	123.80	13.40
	Total	30	128.15	12.54

In Table 2 it is shown that the mean smash of Racket velocity is 48.28 whereas the standard deviation is 3.90, the mean Clear of Racket velocity is 35.04 whereas the standard deviation is 2.24. The mean drop of Racket velocity is 24.82 whereas the standard deviation is 1.07. In same way mean smash of Shuttle velocity is 64.49 whereas the standard deviation is 5.99. Mean clear of Shuttle velocity is 49.03

whereas the standard deviation is 4.98. Mean drop of Shuttle velocity is 25.15 whereas the standard deviation is 3.77. Mean smash of center of mass is 137.20 whereas the standard deviation is 9.55. Mean clear of Shuttle velocity is 123.44 whereas the standard deviation is 9.96. Mean drop of Shuttle velocity is 123.80 whereas the standard deviation is 13.40.

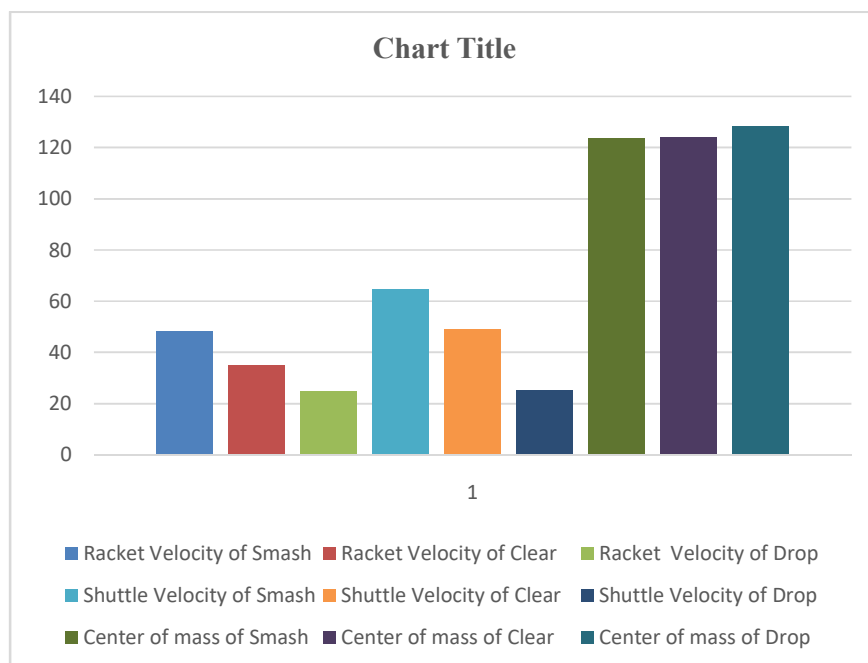


Figure 1 Mean Score of Forehand Overhead Shot

Discussion of Finding

In the Variables Racket velocity, Shuttle Velocity, and Centre of mass it was found to be significance difference among the Forehand Smash, Forehand Clear and Forehand Drop at the significant level of 0.05. By looking mean table of the study it can be reveals that in during smash there is requirement of more Racket velocity than clear and smash. It might be requirement of more power to execute the smash. Similar study was done by Sinclair J., Taylor P J & Hobbs J Sarah (2013) they conducted their research on “Digital Filtering of Three-Dimensional Lower Extremity Kinematic: an Assessment”. Same way in the variable

shuttle velocity the mean value of smash is more reason may after hitting the shuttle will powerful stroke shuttle travel with more velocity similar research was conducted by Jaitner, N. &Garwin, W. (2007) did their research on “Analysis of badminton smash with mobile measure device based on Accelerometry.” In mean table it can be observed that Centre of mass during smash is higher than Drop and Clear it may be due to smash required more power to generate more force one has to extend their body more that is why a badminton player jump as much as high to execute smash .

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