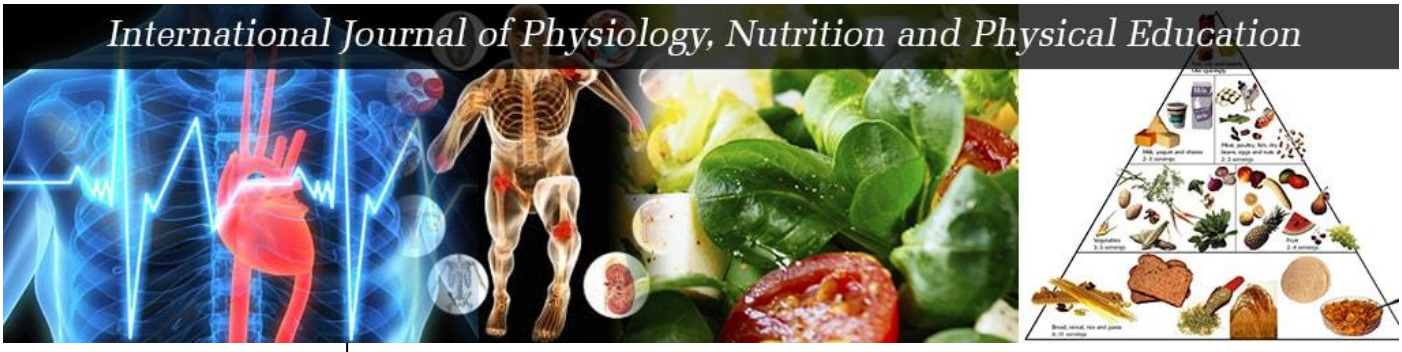

ISSN: 2456-0057
IJPNPE 2019; 4(1): 488-490

www.journalofsports.com
Received: 04-11-2018
Accepted: 06-12-2018

Benu Madhava Pandey
Research Scholar, Dept. of Physical Education, B.H.U. Varanasi, Uttar Pradesh, India

Dr. T Onima Reddy
Associate Professor, Dept. of Physical Education, B.H.U. Varanasi, Uttar Pradesh, India

Dr. V Singh
Associate Professor, Dept. of Physical Education, B.H.U. Varanasi, Uttar Pradesh, India

Correspondence
Benu Madhava Pandey
Research Scholar, Dept. of Physical Education, B.H.U. Varanasi, Uttar Pradesh, India

Kinematical analysis of forehand overhead clear stroke at the time of contact phase in badminton

Benu Madhava Pandey, Dr. T Onima Reddy and Dr. V Singh

Abstract
The purpose of the study was to determine the relationship of joints angles with the performance of Forehand Overhead Clear stroke at the time of contact phase in Badminton. Methodology: - for the present study the sample consisted of Ten Male Indian Badminton players (Rank under 50). The age ranged of the subjects ranged Between 22 to 27 years. Angle of the body measured by kinovea in degree and performance evaluated through subjective judgment by qualified officials on the basis of three judges rating system. For analysis of data correlation (Pearson Correlation) test was used. The level of significance was set at 0.05 levels. Conclusion: - by the help of study it is conclude that there is significant difference was found in right wrist angle with the performance of Forehand Overhead Clear at the time of contact phase in Badminton.

Keywords: Kinematical, forehand, overhead, clear stroke

Introduction
The most often recommended strategy to gain time to return to center court is the high deep clear. When in doubt, clear particularly in singles play. The defensive clear is a high return that has a trajectory similar to a lob in tennis. The clear may be hit with an underhand or overhand to force the opponent the forehand or backhand to force the opponent deep into the backcourt. Plays use the clear in combination with the drop shot to force their opponents to run and defend all four corners of the court.

Always try to hit the bird as soon as possible so your opponent has less time to get to his or her shot. Hit overhead and underhand returns at the highest possible contact point. As you move into position to hit the clear throw your racket upward meeting the shuttle with a flat racket with your elbow extending. Because the shuttle should go high and deep swing your racket forward and up with your hand leading. Then your follow-through finishes in the direction of the bird's flight.

The primary value of the clear during come petition is to keep the shuttle away from your opponent and to make him or her move quickly. If you can get the bird behind your opponent or make him or her move more rapidly than he or she would like, your opponent will have less time and will become more fatigued. If you clear correctly, your opponent will need to hurry to execute his or her returns accurately and effectively. The offensive clear is a flatter, faster clear, which is useful in getting the shuttle behind your opponent and potentially causing him or her to hit weak returns. The defensive clear has a high and deep trajectory. (Grice T. 2008) [6].

Objective of the study
The purpose of the study was to determine the relationship of joints angles with the performance of Forehand Overhead Clear at the time of contact phase in Badminton.

Methodology
For the present study the sample consisted of Ten Male Indian Badminton players (Rank under 50). The age ranged of the subjects ranged Between 22 to 27 years. The study was confined to right handed shuttlers only, Forehand Overhead Clear at the time of contact phase in Badminton.

Procedure of data collection

According to availability of two Casio EX-F1 high speed cameras were used, which have frequency from 60 to 300 frames pe second (f/s). The data were recorded from sagittal plane and frontal plane. The data was analyzed by kinovea motion analysis software.

Statistical Technique

The statistical analysis of data pertaining to the study were collected on 10 male Badminton players. To compute the analysis of data the correlation (Pearson correlation) test was used. The level of significance to check the relationship obtained by correlation (Pearson correlation) was set .05 level. All statistical functions were performed with the SPSS (v.20) software.

Finding and Results

Result was made on the basis of the finding of the present study. The researcher reached at the result of this empirical investigation which is presented by the respective Table-1, table-2, and figure-1.

Table 1: Descriptive Statistics of Male Badminton players in Relation to Angular Kinematical Variables of Clear Stroke in Badminton.

Variable	Mean	Std. Deviation	Minimum	Maximum	Sum
Right Wrist Angle in degree	203.9	11.541	181	218	2039
Left Wrist Angle in degree	203.3	18.061	169	226	2033
Right Elbow Angle in degree	157	4.876	150	164	1570
Left Elbow Angle in degree	83.5	17.933	57	111	835
Right shoulder Angle in degree	134.1	4.605	126	139	1341
Left shoulder Angle in degree	48.6	28.457	13	115	486
Right Hip Angle in degree	182.5	5.082	176	192	1825
Left Hip Angle in degree	196.5	5.778	190	206	1965
Right Knee Angle in degree	150.3	10.594	138	171	1503
Left Knee Angle in degree	169.9	9.097	152	180	1699
Right Ankle Angle in degree	116	9.660	102	130	1160
Left Ankle Angle in degree	94.5	7.691	86	108	945

It is evident from table-4 that mean, standard deviation, scores of Angular kinematics variable in degree during clear stroke in badminton have been found as follow: Right wrist angle 203.9 (Std.11.541), Left wrist angle 203.3 (Std.18.061), Right elbow angle 157 (Std.4.876), Left elbow angle 83.5 (Std.17.933), Right shoulder angle 134.1 (Std.4.605), Left Shoulder angle 48.6 (Std.28.457), Right hip angle 182.5 (Std.5.082), Left Hip angle 196.5 (Std.5.778), Right knee angle 150.3 (Std.10.594), Left knee angle 169.9 (Std.9.097), Right ankle angle 116 (Std.9.660), Left ankle angle 94.5 (Std.7.671) respectively.

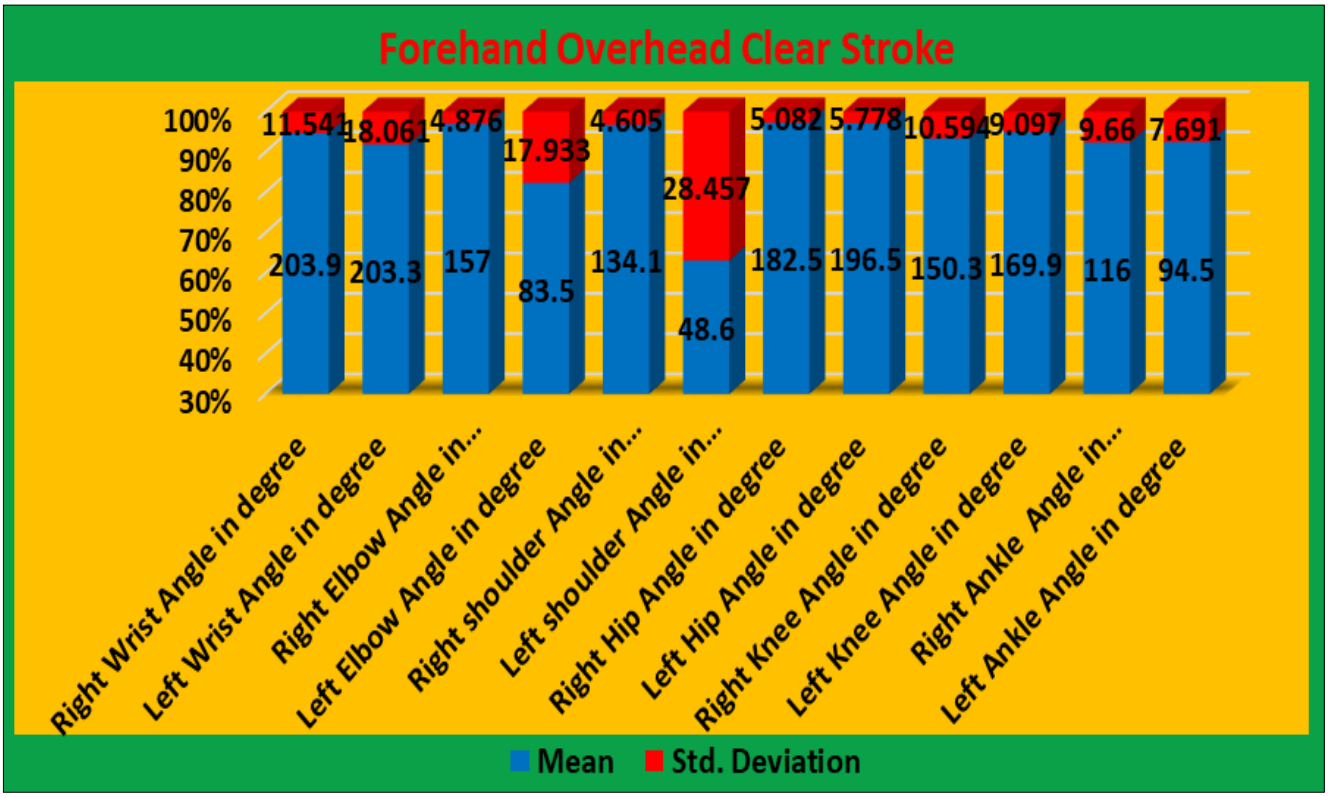

Fig 1: Graphical Representation of male Badminton player in relation to Angular Kinematical variables of Clear stroke in Badminton.

Table 2: Relationship of Angular Kinematical Variables with the Performance of clear Stroke in Badminton.

Angular Kinematical Variable	Pearson correlation												
	Performance	Wrist R	Wrist L	Elbow R	Elbow L	Shoulder R	Shoulder L	Hip R	Hip L	Knee R	Knee L	Ankle R	Ankle L
Performance	1												
Wrist R	0.949*	1											
Wrist L	-0.122	-0.267	1										
Elbow R	-0.472	-0.621*	0.640*	1									
Elbow L	-0.144	-0.199	0.001	-0.085	1								
Shoulder R	0.075	0.131	0.314	0.089	-0.719*	1							
Shoulder L	0.290	0.222	0.112	-0.139	0.578*	-0.375	1						
Hip R	-0.343	-0.411	-0.305	0.138	-0.092	0.016	0.077	1					
Hip L	0.312	0.332	-0.218	-0.354	-0.040	-0.031	-0.274	-0.145	1				
Knee R	0.356	0.392	-0.305	-0.524	0.270	0.006	0.686*	0.314	0.091	1			
Knee L	-0.298	-0.296	-0.206	-0.005	-0.095	-0.092	-0.117	0.462	-0.303	-0.260	1		
Ankle R	-0.225	-0.332	0.583*	0.382	-0.089	-0.122	0.009	-0.233	-0.310	-0.476	0.035	1	
Ankle L	-0.501	-0.612	-0.053	0.239	0.352	-0.183	0.324	0.788*	-0.383	0.363	0.181	-0.031	1

*Significant at 0.05 level

Coefficient of correlation required to be significant at 8 degree of freedom = (.549)

Table-10 reveals that in case of wrist right obtained value of (.949) is greater than tabulated value of (.549) therefore it shows significant relationship of this independent variable with clear stroke performance. Whereas, in case of wrist left, elbow right, elbow left, shoulder right, shoulder left, hip right, hip left, knee right, knee left, ankle right, ankle left the obtained values (-.122), (-.472), (-.144), (.075), (.290), (-.343), (.312), (.356), (-.298), (-.225), and (-.501) are lower than tabulated value of (.549) therefore it shows insignificant relationship of these independent variables with performance of clear stroke in badminton.

Since the significant relationship was found between angle of right wrist and angle of right elbow among independent variables as calculated 'r' (.621) is found greater than the required tabulated value of (.549) at 0.05 level of significance.

Since the significant relationship was found between angle of left wrist and angle of right elbow among independent variables as calculated 'r' (.640) is found greater than the required tabulated value of (.549) at 0.05 level of significance.

Since the significant relationship was found between angle of left shoulder and angle of right knee among independent variables as calculated 'r' (.686) is found greater than the required tabulated value of (.549) at 0.05 level of significance.

It can be seen the significant relationship was found between angle of left Elbow and angle of right shoulder among independent variables as calculated 'r' (.578) is found greater than the required tabulated value of (.719) at 0.05 level of significance.

It can be seen the significant relationship was found between angle of left Elbow and angle of left shoulder among independent variables as calculated 'r' (.578) is found greater than the required tabulated value of (.549) at 0.05 level of significance.

Similarly, the significant relationship was found between angle of left wrist and angle of right ankle among independent variable variables as calculated 'r' (.583) is found greater than the required tabulated value of (.549) at 0.05 level of significance.

Finally, the significant relationship was found between angle of right hip and angle of left ankle among independent variable variables as calculated 'r' (.788) is found greater than the required tabulated value of (.549) at 0.05 level of significance.

Discussion of the Study

As per the objective of the study was to determine the relationship of joints angles with the performance of Forehand Overhead Clear stroke at the time of contact phase in Badminton. Through this study, we found that there was significant difference found between right wrist angle at the time of contact phase of Forehand Overhead Clear Stroke performance in Badminton players.

This may be attributed to fact that; the Forehand Overhead Clear Stroke is the Defensive stroke in badminton. It most commonly used for sent the shuttle to the opponent's back boundary line. Wrist joint is the key joint of hitting hand at the time of contact phase of Forehand Overhead Clear Stroke in badminton, it is most-often recommended strategy to gain time to return to center court is the Forehand Overhead Clear. The hitting hand must have a long back swing with lock wrist and flexed elbow for a powerful clear.

Conclusion

On the basis of the obtained results from the present study the following conclusion were drawn: -

1. There was significant difference found among right wrist at the time of contact phase of Forehand Overhead Clear performance of badminton players.
2. The finding also suggests that, the right wrist is the key joint at the time of contact phase of Forehand Overhead Clear.

References

1. Gowitzke BA. Technique of Badminton Stroke Production: Science in Badminton. Racquet Sports, CA Academic Publishers. Hay, J.H, 1976-1993.
2. The Biomechanics of Sports Techniques. Fourth Edition. Prentice-Hall, Inc. Subarjah, H, Permainan Bulutangkis. CV. Bintang Warliartika Bandung, 2011.
3. Tsai C-L, Huang C. Biomechanical Analysis of Two Types of Badminton Forehand Overhead Smashes. The 1996 Pre-Olympic Scientific Congress, Program and Abstract Book Dallas, Texas, 1996.
4. The Biomechanics of Sports Techniques. Fourth Edition. Prentice-Hall, Inc. Subarjah, H. Permainan Bulutangkis. CV. Bintang Warliartika Bandung, 2011.
5. Tang HP, Abe K, Katoh K, Ae M. Three-Dimensional cinematographically analysis of the badminton forehand smash: Movements of the forearm and hand. Science and racket sports. Cambridge: E & FN SPON, 1995.
6. Badminton Steps to Success, Second Edition. G. Toney. Library of Congress Cataloging-in-Publication Data, 2008, 37.