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Analysis of the Centre of Gravity in Various Phases of Cross-over Step of the Block with the Performance in Volleyball

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Abstract

Objective of the study: *- The purpose of the study was to find out the correlation between the height of central of gravity in different phase of the cross-over step of the block and the blocking performance of volleyball players. The results of this study will reveal the connection between specific linear parameters and blocking performance in the various phases of the cross-over step during blocking in volleyball. Additionally, this research will provide valuable insights for designing training programs aimed at enhancing the blocking performance of volleyball players.* ***Methodology:*** *- For the present study the sample consisted of 10 male volleyball players. The age ranged of the subject 18 to 30 years. Subjects were selected from all over India with minimum achievements of the subjects were national level participant. All the linear measurements were taken with the help of* Kinovea *in centimetre during the block in different phase of the cross-over step and blocking performance were measured with help of blocking test given by Alnedral in 2020 by all the selected subject. For the analysis of data correlation (Pearson Correlation) test was used. The level of significance was set at 0.05 levels.* ***Results:*** *The results of the study reveals that, In case in case of Height of Centre of gravity in phase -1 (H1),Height of Centre of gravity in phase -2 (H2) in cm, Height of Centre of gravity in phase -3 (H3) in cm, Height of Centre of gravity in phase -4 (H4) in cm, Height of Centre of gravity in phase -5 (H5) in cm the obtained values (0.094), (0.321), (0.435), (0.296), and (0.338), are lower than the tabulated value of (0.632) therefore it shows insignificant relationship found in height of gravity of different phase of cross over step & blocking performance of Volleyball Players.* ***Conclusion:*** *According to the study there is no significant difference found between height of central of gravity in different phase of the cross-over step of the block and the blocking performance of volleyball players.*
Keywords: *Central of gravity, cross-over step,*

INTRODUCTION

The concept of centre of gravity is essential in sports. The centre of gravity (CG) plays a significant role in sports as it affects an athlete's stability, balance, agility, and overall performance. The centre of gravity refers to the point where an object's weight is evenly distributed and acts as the balance point. In sports, an athlete's body position relative to their centre of gravity affects their overall control and ability to exert force efficiently. Understanding and controlling the centre of gravity is essential in sports as it enables athletes to optimize their performance, maintain stability, improve balance, and generate power efficiently. Coaches and athletes often focus on training activities that develop coordination, strength, and body control to enhance control over their centre of gravity in their respective sports.

In volleyball, the concept of centre of gravity is crucial in blocking, which is the defensive action of stopping an opponent's attack. The ability to effectively lower and shift the centre of gravity allows blockers to maintain stability, react quickly, and generate power while blocking. Here's how centre of gravity influences blocking in volleyball. Blocking in volleyball heavily relies on the centre of gravity. Blockers need to establish a low and stable base, enabling them to jump effectively, reach over the net, and penetrate into the opponent's space to block attacks

successfully. Understanding the importance of centre of gravity in volleyball helps players enhance their stability, balance, and overall performance on the court. Coaches often incorporate drills and exercises that focus on lower body strength, agility, and body control to optimize their players' centre of gravity for improved playing abilities.

Objective of the Study

The purpose of the study was to investigate the correlation between the height of central of gravity in different phase of the cross-over step of the block and the blocking performance of volleyball players.

METHODOLOGY

Selection of Subjects

For the present study the sample consisted of 10 male volleyball players. The age ranged of the subject 18 to 30 years. Subjects were selected from all over Uttar Pradesh with minimum achievements of the subjects were national level participant.

Selection of Variable

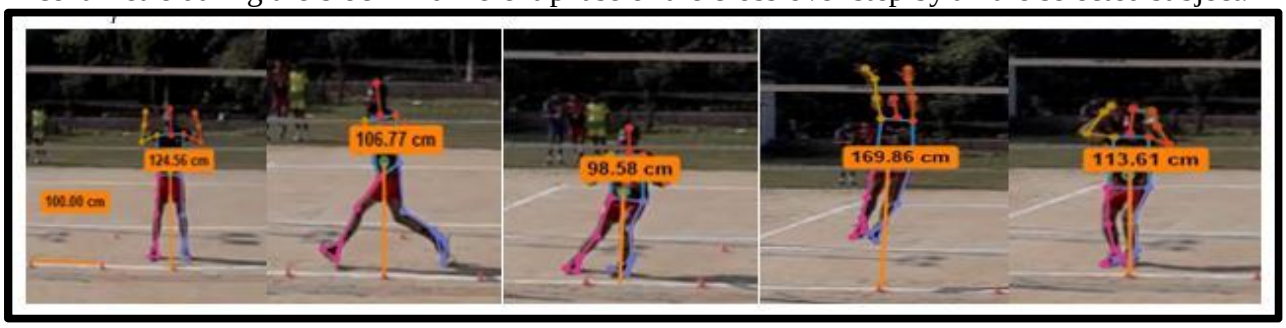
Height of central of gravity of all the selected players was selected as a dependent variable. Block performance during the block in different phase of the cross-over step of volleyball player was selected as an independent variable of the present study.

Selection of test

To find out the relationship in between dependent (Height of Central of gravity) and independent variables (Blocking Performance) during the block in different phase of the cross-over step the research scholar selected the following test.

Dependent variable

Height of Central of gravity during the block in different phase was measured by Kinovea in centimetre during the block in different phase of the cross-over step by all the selected subject.



Height of Central of Gravity during Crossover Step Block In Different Phases

Independent variables

Blocking performance during crossover step block were measured with help of blocking test given by Alnedral in 2020 by all the selected subject.

Procedure of data collection

The test was administered on the subjects those who are participate in national team of various state of India during evening practice session data was collected. All the subjects have participated in national level championships conducted by volleyball federation of India. A thorough warm up should be given. There was three trials provided to each subjects for blocking Performance during the block of the cross-over step and best total blocking performance of the subjects were taken.

Statistical technique

The Statistical analysis of data pertaining to the study were collected on 10 male volleyball players. For 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.

FINDINGS AND RESULTS

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

Table -1 Descriptive Statistics of Height of Centre of Gravity of Different Phase of Cross Over Step & Blocking Performance of Volleyball Players

S. No.	Variables	N	Mean	Std. Deviation	Range	Std. Error of mean
1	**Performance**	10	9.3000	.8232	2.00	0.260
2	**Height of Central of gravity in phase -1 (H1)**	10	126.97	7.772	24.00	2.458
3	**Height of Central of gravity in phase -2 (H2)**	10	109.51	4.148	12.79	1.311
4	**Height of Central of gravity in phase -3 (H3)**	10	101.20	3.041	9.48	0.961
5	**Height of Central of gravity in phase -4 (H4)**	10	178.89	6.943	18.56	2.195
6	**Height of Central of gravity in phase -5 (H5)**	10	112.37	4.323	14.50	1.367

It is evident from table – 1 that mean, standard deviation, scores of Centre of gravity during the block in different phase in volleyball have been found as follow: Blocking performance 9.300 (±0.823), Height of Centre of gravity in phase -1 (H1) in cm 126.97 (±7.772), Height of Centre of gravity in phase -2 (H2) in cm 109.51 (±4.148), Height of Centre of gravity in phase -3 (H3) in cm 101.20 (±3.041),Height of Centre of gravity in phase -4 (H4) in cm 178.89 (±6.943), Height of Centre of gravity in phase -5 (H5) in cm 112.37 (±4.323),and respectively whereas standard Error and Range of scores was found as follow Blocking performance 0.2603 (±2.00), Height of Centre of gravity in phase -1 (H1) in cm 2.458 (±24.00), Height of Centre of gravity in phase -2 (H2) in cm 1.311 (±12.79), Height of Centre of gravity in phase -3 (H3) in cm 0.961 (±9.48), Height of Centre of gravity in phase -4 (H4) in cm 2.195 (±18.56), Height of Centre of gravity in phase -5 (H5) in cm 1.367 (±14.50), respectively.

Figure: - 1 Graphical Representation of Mean and S.D. Score of Height of Centre of Gravity of Different Phase of Cross Over Step & Blocking Performance of Volleyball Players

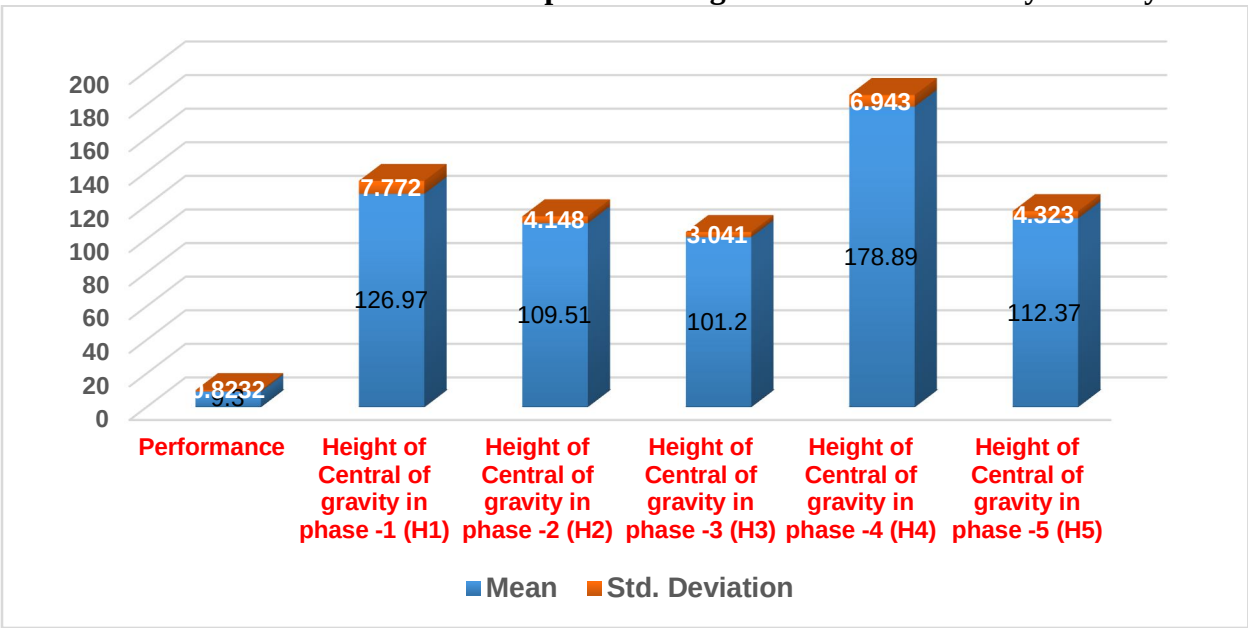


Table-2 Relationship of Height of Centre of Gravity of Different Phase of Cross Over Step & Blocking Performance of Volleyball Players

S. No.	Variables	Mean	Coefficient of Correlation (r)
1	**Height of Central of gravity in phase -1 (H1)**	126.97	0.094
2	**Height of Central of gravity in phase -2 (H2)**	109.51	0.321
3	**Height of Central of gravity in phase -3 (H3)**	101.20	0.435
4	**Height of Central of gravity in phase -4 (H4)**	178.89	0.296
5	**Height of Central of gravity in phase -5 (H5)**	112.37	0.338

Coefficient of correlation required to be significant at 8 degree of freedom = (0.632)

Table -2 reveals that in case of Height of Centre of gravity in phase -1 (H1),Height of Centre of gravity in phase -2 (H2) in cm, Height of Centre of gravity in phase -3 (H3) in cm, Height of Centre of gravity in phase -4 (H4) in cm, Height of Centre of gravity in phase -5 (H5) in cm the obtained values (0.094), (0.321), (0.435), (0.296), and (0.338), are lower than the tabulated value of (0.632) therefore it shows insignificant relationship of these of height of gravity of different phase of cross over step & blocking performance of Volleyball Players.

DISCUSSION OF THE STUDY

The correlation (Pearson Correlation) technique was applied to determine the relationship of height of gravity of different phase of cross over step & blocking performance of Volleyball Players. In case of height of gravity of different phase of cross over step & blocking performance of Volleyball Players, the results of the study reveals that, In case in case of Height of Centre of gravity in phase -1 (H1),Height of Centre of gravity in phase -2 (H2) in cm, Height of Centre of gravity in phase -3 (H3) in cm, Height of Centre of gravity in phase -4 (H4) in cm, Height of Centre of gravity in phase -5 (H5) in cm the obtained values (0.094), (0.321), (0.435), (0.296), and (0.338), are lower than the tabulated value of (0.632) therefore it shows insignificant relationship

of these of height of gravity of different phase of cross over step & blocking performance of Volleyball Players.

The results obtained in the study show that insignificance deference found between heights of centre of gravity with the performance of cross over step blocking technique in Volleyball because all selected subject are specialized as blockers and their anthropometrical character was also almost similar. During a volleyball game, all blockers have to perform almost the same movements. Less height of Centre of gravity position help to increase balance and stability, but getting up and balancing is necessary for the cross over step blocking technique. So all players need a balance jump for a safe landing in blocking for proper performance. This point of Centre of gravity changes with changes in the player's weight and position, and is also based on body position and speed. You can clearly see that there is uniformity in the performance of all the players. And this uniformity is necessary to perform the correct technique. Insignificant deference have occurred due to the above reasons.

CONCLUSIONS

Cross over step blocking technique is an important technique in Volleyball. According to the study there is no significant difference found between deferent phases of cross over step technique in Volleyball because all selected subject are specialized as blockers and their anthropometrical character was also almost similar. During a volleyball game, all blockers have to perform almost the same movements. Individual differences in the role or playing position of the same player and inter-individual differences between players should also be taken into account. Indeed, future studies should address these gaps in knowledge and analyse the relationship of the height of the centre of gravity on other blocking techniques in volleyball.

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