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Dr. Ranjit Singh Rawat
Sports Officer, Government
College, Sanwer, Madhya
Pradesh, India

Dr. Rakesh Yadav
Assistant Director, P. E. JNU,
New Delhi, India

Relationship of center of gravity with the performance of jump shot high in team handball

Dr. Ranjit Singh Rawat and Dr. Rakesh Yadav

Abstract

Relationship was carried out to study center of gravity with the performance of jump shot high in team handball. For this research 08 male handball players of LNIPE Gwalior of age 20 ± 5 , subject were selected on the basis of purposive sampling. The Pearson's product moment correlation was used in order to find out the relationship between center of gravity at takeoff and execution moment with the performance Jump shot high in team handball. For testing the hypothesis the level of significance was set at 0.05 where it was hypothesized that there may be significant association between center of gravity at takeoff and execution moment with the performance Jump shot high in team handball. For this through segmentation method center of gravity was determined to see the association with the performance of jump shot high in team handball. After applying product moment correlation the obtained value of correlation ($r=0.778$) for 6 degree of freedom, only height of center of gravity at moment execution of the subjects was greater than the required value of 0.707 at 0.05 level of significance. Moment Take-off has exhibited no significant association with the performance of subjects in Jump shot high. Therefore the research study revealed that there is a significant relationship between center of gravity (execution moment) with the performance of jump shot high in team handball.

Keywords: Relationship, handball, performance, gravity

Introduction

The game of Handball is not very old, although Handball has been played in different form and under different names having some similarity of the game like 'HAZANA', 'TORBALL', and 'HANDBOLD' and others.

Human beings usually are involved in the act of running, jumping, throwing, catching, kicking, striking and performing a vast range of different skills. Initially they learn them as general skills and in proceeding stages improved definite sports skills. Greater specificity and complexity are developed after connecting these skills into patterns. (Singh Mandeep, 2014) [10].

"Biomechanics measurement allows for precise, quantifiable examination of technical features, which then becomes a benchmark of a training program and seems to be a factor in effective training design, particularly if it concerns to detect the degree of performance expertise and assessing it as part of an athlete's personal growth process, as well as adopting Kinesiological operators and modeling methodical methods" (Marques Mc, *et al.*, 2007) [12].

Kinematics refers to the geometry of motion, it considers displacement, velocity and acceleration irrespective of the forces working on the body. It is a domain of biomechanics that deals with explaining the body's motion. Thus kinematics explains concepts as how distant a body transfers, how speedy it moves and also the consistency with which it moves. It does not care at all about what causes a body to move in a way it does. Kinematics is definitely the expressive geometry explaining motion in consideration to time, excluding the causes of motion and the concepts of mass, force, momentum and energy Beach, Clark Richard (1984) [11].

Handball is a team sports in which two teams of seven players is required to play a game. In team handball such technique are jump shot long, jump shot high, fall shot, overhead pass, puss pass, behind pass etc. There are various technique which player learn and execute during the game but there are specific zone where the effectiveness of these technique are been in top priorities, so therefore to assess and see the relationship between such technique with the performance in team handball required kinetic and kinematics analysis knowledge in specifics sports.

Corresponding Author:
Dr. Ranjit Singh Rawat
Sports Officer, Government
College, Sanwer, Madhya
Pradesh, India

To get better output and understanding of these techniques with the performance in handball the researcher took jump shot high as a technique to understand the relationship with the performance.

Methods

In this study all the subject was well experienced and researcher well motivate before d collection of the data. Total Eight male Handball players of Lakshmi bai National Institute of Physical Education were selected as subjects for the research study. The age of subjects was between 20±5 years. The criterion measures for the study were: locating center of gravity at the moment of take-off and execution of Jump shot high with Jump shot High performance as assessed through zinn battery test. The jump shot high of different players were photographed at Handball court and researcher developed stick figure on the basis of photographs the center of gravity of each subject, at selected moment i.e. execution and takeoff was located by using segmentation method.

Center of Gravity

The center of gravity of the human body may be defined as the point of exact center, around which body may rotate freely in all directions.

Administration of tests

All the players were given five trials for executing jump shot high. Researcher in advance guides the players to take three

steps before attempting jump shot high technique outside the free throw line (9 meter away from goal post). In goal post specific area was marked where player have to execute the jump shot high and based on the attempt they were awarded the points.

Statistical tool

The Pearson’s product moment correlation was used in order to find out the association between Moment Take-off and Moment Execution with the performance of Handball players in Jump shot high. For testing the hypothesis, the level of significance was set at 0.05.

Results

Table 1: Average height of center of gravity at (Moment Take-off and Moment Execution)

S.no.	Center of Gravity Moment Take-off (Cm)	Center of Gravity Moment Execution (Cm)
1	119.73	131.17
2	113.87	127.90
3	126.70	133.51
4	129.28	131.67
5	110.55	122.41
6	126.77	134.40
7	122.47	132.42
8	117.14	137.41

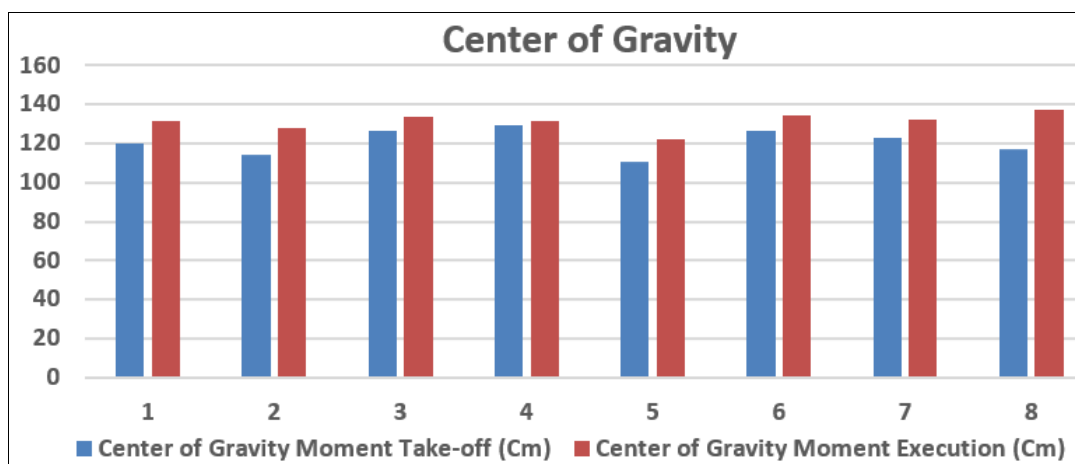


Fig 1: Graphical representation of Average height of center of gravity at (Moment Take-off and Moment Execution)

Table 2: Coefficient of Correlation (r)

S. No.	Variables	Coefficient of Correlation (r)
1.	Height of Center of Gravity of Handball players at the moment of takeoff phase.	0.117
2.	Height of Center of Gravity of Handball players at the moment of execution phase. (shot)	0.778*

Significant at 0.05 level.

As shown in Table 2 the height of Center of Gravity of Handball players at the moment of execution phase. The obtained value of Coefficient of Correlation (r=0.778) for 6 degree of freedom for the subjects was greater than the required value of 0.707 at 0.05 level of significance. However, the obtained value of coefficient of correlations (0.117) at takeoff moment was less than the required value at selected level of significance, therefore, the height of center of gravity at moment execution have shown significant relationship with the performance of subject in Jump shot high in Handball.

Discussion

In the table 2 the height of center of gravity of the subjects at moment execution, exhibited a positive significant relationship at the selected level of 0.05. This means that while performing Jump shot high, higher the center of gravity at moment execution of the subjects better will be the performance in team handball. Relationship of center of gravity at the moment take off with the performance of subjects in Jump shot high was insignificant therefore hypothesis is rejected at 0.05 level, but relationship of center of gravity at the moment execution with the performance of subjects in Jump shot high was significant

therefore hypothesis is accepted at 0.05 levels.

Conclusion

Jump shot high is the technique which is used by the players in handball (backcourt players), this technique is always been effective to score a goal from away the free throw line, therefore to gain maximum vertical height the center of gravity plays a vital role in scoring the goal from the area of 9 meter by the back court players. In this researcher got the close idea for effective identifying/ selection of players for the specific area in team handball who can take better advantage for utilizing one of the weapon named as Jump shot high in handball.

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