

The relationship of some kinematic variables to the accuracy of shooting from jumping forward in handball

علاقة بعض المتغيرات الكينماتكية بدقة التصويب من القفز للأمام في كرة اليد

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Abstract:

This research aims to identify some of the kinematic variables and their relationship to the precision of shoot in handball and used the descriptive method for the relevance of the nature of the study. and the sample consisted of 05 players, the senior class from the team of (MCB) Oued Sly, which Active in the Second National Section The researchers also used a Sony camera 50f/s, and the kinovea analysis program and they relied on the (spss) statistical program to process the data, and a correlation was found. Significant relationship between some kinematic variables and ball shooting accuracy.

Keywords: Kinematic variables; shooting in handball; handball

ملخص:

يهدف هذا البحث الى التعرف على بعض المتغيرات الكينماتكية لمهارة التصويب لدى لاعبي كرة اليد و العلاقة بين تلك المتغيرات ودقة تصويب الكرة و اتبع الباحث المنهج الوصفي بأسلوب العلاقات الارتباطية لملائمته لطبيعة البحث وكانت عينة البحث (05) لاعبين صنف الاكابر من فريق وفاق واد السلي الذي ينشط في القسم الوطني الثاني، قام الباحث بعملية التصوير مع أخذ أفضل المحاولات مستخدماً آلة تصوير من نوع 50 sony صورة في الثانية يابانية الصنع و أعتمد على برنامج kenovea لاستخراج قيم المتغيرات الكينماتكية قيد الدراسة و استخدم برنامج الاحصائي spss لمعالجة البيانات و تم التوصل الى وجود علاقة ارتباط معنوية بين بعض المتغيرات الكينماتكية و سرعة تصويب الكرة .

كلمات مفتاحية: المتغيرات الكينماتكية ؛ التصويب في كرة اليد ؛ كرة اليد

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I -Introduction:

In recent years, the game of handball has witnessed remarkable development, which has led to a change in the nature of play and the diversity of its methods. As a result, officials in this field have begun careful planning to raise the level of their teams for the better. Biomechanics has had a great advantage in this field as it is concerned with applying all the knowledge, information and research methods related to training. The structural and functional structure of the human motor system, and then it is possible to detect weak points and develop motor solutions, as well as strengthen strengths and establish motor paths ; where “White 2001 “ confirms that the Progress expresses complete harmony between the mind and body, where everything the learner thinks has a reaction, regardless of whether this thought or feeling is real or imaginary to The biological system and the changes occurring in it, “Therefore, the biomechanical characteristics describe the human body as the subject of mechanical movement,” and the presence of scientific devices and methods used as diagnostic devices and means led to clarifying the function of the athlete’s movement, regardless of the different possibilities (Ghaffar Saad 2016, p. 19).

The approximate steps contribute to directing the movement towards its correct path, and the better the introduction to the performance, the better the final result of the performance as well, and vice versa. Therefore, the speed of approach is the first variable in a series of mechanical variables in the skill of shooting the ball from jumping, especially since such skills depend on the speed factor. Primarily to surprise the opposing team’s defenses, and this is what (Haider Shamkhi, 2012) pointed out. Muhammad Hamouda and Ashraf Kamel (2013, p. 57) add that performance in handball depends on the interaction and coordination between the movements and skills involved in the situations and the strategy that depends on the correct timing for choosing Appropriate skills depending on the speed of movement of competitors and colleagues Performance in handball requires the formation of behavioral patterns and the individual’s ability to change and modify his behavior according to the changing playing situations during competition.

The importance of research was demonstrated in the study of one of the most important skills in the game of handball, which is the skill of shooting in handball, which is considered the natural goal and end of investing in every means. It is used by the team to win the match, so the researcher decided to study and analyze this skill and find relationships to some of its variables through kinematic

analysis to reach the ideal technical performance level in order to complete part of this skill. Therefore, the researcher decided to delve into the field of biomechanics in order to identify the values of some kinematic variables and their relationship to aiming accuracy. This led the researcher to ask the following question:

Is there a statistically significant relationship between some kinematic variables and the accuracy of shooting from jumping forward in handball?

-Research hypothesis:

There is a statistically significant relationship between some kinematic variables and the accuracy of shooting from jumping forward in handball

-The aim of the study:

- Determining the values of some kinematic variables for the handball shooting skill from jumping forward from jumping.
- Determining the relationship between some kinematic variables and the accuracy of shooting from jumping forward in handball.

II – Method and Materials :

1. Method:

The nature of the problem at hand determines the nature of the method used (Alawi and Ratib 1999, p. 217), so the researcher used the descriptive, correlational method, which is compatible with the nature of the research problem.

2. The research sample:

The goals that the researcher sets for his research and the procedures that he uses are what determine the nature of the population or sample that you choose (Raysan Kharbit, 1988, p. 41).

The study consisted of the players of the ES Oued Selli team, the senior class, belonging to the second regional division of the Oran Handball Association for the 2019 football season, numbering (players). The study sample was chosen intentionally for the best (05) players who emerged in scoring goals during the tournament, and Table No. (01) It shows the extent of homogeneity and equivalence of the sample, as the skewness coefficient is limited to (± 1), and therefore the sample is considered normally distributed.

Table No. (01) It shows the extent of homogeneity and equivalence of the sample

Variables	Unit of measurement	SMA	standard deviation	Torsion coefficient
height	Meter	1.80	0.025	-0.196
the weight	kg	80.60	1.949	-0.081
the age	year	23.90	1.431	0.332
Training age	year	13.90	0.741	0.552

3. Identifying variables and how to measure them:

3-1-The maximum height of the hip joint at the moment of flight: This is the distance between the ground and the hip joint at its maximum height.

3-2-The angle of the torso at the moment of shooting the ball: It is the angle between the torso and the horizon at the moment of shooting the ball.

4-Search tools:

Arab and foreign sources

Sony portable media device.

- Sony camera 50 r/s
- Triple holder (01)
- Legal handballs.
- 1 meter drawing scale.
- Measuring tape.
- A medical scale to measure players' weights.
- A device for measuring lengths.
- Kenovea 8.15 motor analysis program

1- Test specifications used in the research

It represents a technical performance test for the scoring skill of jumping forward in handball

The aim of the test is to measure the accuracy of shooting from jumping forward

Performance method:

The experimenter stands with the ball in his hand behind a one-meter-long line drawn on the ground parallel to the wall on which the target is drawn and seven

meters away from the wall. He shoots 5 balls at the circles attached to the goal after taking three steps, then jumping, then throwing, starting with the circle in the upper right corner, then The left corner, then the middle, then the bottom right corner, then the bottom left corner.

Calendar method:

If the ball enters the circle, it is scored with three points, if it touches the frame, it is scored with two points, and if it is outside the frame, the attempt is not counted.

Scientific foundations of the test:

Stability of the test: Marwan Abdel Majeed says, “The stability of the test is maintaining its results if it is repeated on the same sample” (Damim Muhammad 2016, p. 205). We verified

the stability of the test by repeating it on a reconnaissance sample consisting of (05) players,

The results showed that the reliability coefficient of the test was estimated at (0.726), which achieves stability, and Table No. (2) shows the Pearson correlation value between the results of the two performances.

Validity of the test:

The self-validity of the test was extracted from the reliability coefficient by calculating the square root of the reliability coefficient (Bin Naaja Muhammad 2018, p. 177)

Self-honesty coefficient = 0.85

Table No. (02) shows the scientific parameters of the test

Factor Honesty	Factor Consistency	Calculated (R) value	second application		first application		
			standard deviation	SMA	standard deviation	SMA	
0.85	0.726	**0.726	0.675	2.04	0.577	2.20	Precision

- Main experience:

The main experiment for the research was conducted on 01/17/2024 at exactly four o'clock in the evening in the same stadium mentioned previously. The members of the research sample (05 players) were subjected to the process of photographing the technical performance of the skill of aiming a handball towards the goal from a jump in one day, by giving (05) Attempts for each player to hit according to its apparent structure and its four stages: approaching, rising, scoring, and landing. For the purpose of scoring, after performing the approximate steps, then rising and shooting the ball towards the goal.

-Video shooting procedures:

The camera was placed at a distance of (8.15) m from the point of performing the skill on the field, and at a height of (1.70 m), measured from the ground to the focus of the lens, on the right side of the player and at a perpendicular angle to him, through which the player's variables were fully identified, and the camera was used. Drawing scale (1) m.

Computer analysis:

The researcher transferred the film from the camera memory (Sony) to an SD card using a computer (Sony) in order to facilitate the analysis steps, and then transferred these files to the program (Kinovea) version 8.15 installed on the computer, and this program is dedicated to analyzing sports movements.

6-Statistical tools:

The data was analyzed using the statistical package (SPSS version 24) to extract:

- Arithmetic mean.
- standard deviation.
- Torsion coefficient.
- Pearson simple correlation coefficient.

III – Results :

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Table (02) shows the results of arithmetic means, standard deviations and the relationship between certain values Kinematic variables of the shooting skill of jumping forward in handball with precision

Kinematic variables	unit of measurement	SMA	standard deviation	Scoring accuracy		Calculated (R) value
				SMA	standard deviation	
The height of the hip joint at the moment of shooting the ball	meter	1.311	0.070	2.40	0.707	0.490*
Torso angle when the ball is aimed	degree	31.64	5.83			-0.813**

We notice in table no. (03) that there is a relationship between the arithmetic means of the values of certain kinematic variables and the scoring accuracy variable, and with the aim of testing the hypothesis in terms of the relationship between the values . of some kinematic variables for shooting skill and shooting accuracy in a forward jump in handball, the results were statistically processed by means of Pearson's correlation coefficient, using the statistical system (SPSS), and based on the above, the results. of these variables were presented and discussed as follows

VI- Discussion:

Using Table No. (03), the arithmetic mean of the hip joint height variable at the time of shooting the ball for the research sample was (1.311), with a standard deviation estimated at (0.070), as for the headshot accuracy variable. . Its arithmetic average is (2.40) m/s with a standard deviation of (0.707). The correlation coefficient was estimated at (*0.490), which is higher than the tabular value, which indicates that there is a significant correlation between the shooting accuracy variable and the shooting joint height variable when shooting the ball.

The researcher attributes the reason for this to the fact that the members of the research sample worked to perform the appropriate and appropriate height to achieve the goal of this skill, which is to obtain the best appropriate height, which led to the player achieving the best accuracy, as the stretch in some joints of the body made the height of the hip joint point to this amount, as it was This is appropriate, and this is due to the amounts of force exerted during the rise phase, which works to achieve stretching in the joints of the driving leg, in addition to directing the flight path of the player's center of gravity through optimal

exploitation of the vertical thrust output and the transfer of mechanical energy from the lower part to the upper part of the body in a proper manner, and this What was confirmed by the study (Hajim Shani Odah and al., 2014, p. 467)

From Table No. (03), it is clear that the arithmetic mean of the torso angle variable at the moment of hitting the ball for the research sample was (31.64) with a standard deviation of (5.83). As for the aiming accuracy variable, its arithmetic mean reached (2.40) m/s, with a standard deviation of (0.707). The correlation coefficient was estimated at (-0.813), which is greater than the table, which indicates the existence of an inverse significant correlation between the variable of shooting accuracy and the variable of the torso angle at the moment of shooting the ball. The researcher explains that the reason for this relationship is due to the implementation of the quick shot, which requires rotation of the torso around the longitudinal axis. This rotation intervenes in increasing the momentum to the shoulder, then the forearm and the hand, and thus the aiming force increases, which gives the body a high speed, and thus all this momentum is transferred to the ball.

This is consistent with the study of (Mashreq Khalil Fathi, 2006, p.101), in which the player must increase the backward inclination of the torso and shoulder before shooting, to increase the angle of the torso and shoulder, and then work to reduce them when shooting the ball, while decreasing the performance time. Through this, their angular velocity increases, and thus increases. Circumferential speed: The torso also gets an amount of movement that is added to the amount of movement of the shoulder and arm, which helps in moving or changing the direction of the ball with speed and high accuracy. This is done by relying on the peripheral speed of the arm, as the amount of speed that the arm loses during shooting is gained by the ball.

V-Conclusion:

The studied kinematic variables contributed to achieving an ideal performance level for shooting accuracy, as there was a significant correlation between the shooting accuracy variable and the hip joint height variable at the moment the ball was hit with the head. This is through optimal exploitation of the vertical thrust output. An inverse significant correlation was also found between the shooting accuracy variable and the angle variable. The torso at the moment of shooting the ball, where the player needs a quick movement of the torso by curving it

backwards, which gives him a wide range of motion. This is done by exploiting the motor transfer from the torso to the shoulder and arm, then moving to the ball so that it moves towards the desired place with great force, speed, and accuracy. From this we can say that the research hypothesis has been achieved to a large extent.

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