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An analytical study of some special variables associated with the stages of the overwhelming hit in volleyball

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Abstract:

The world is witnessing at the present time great progress in the application of modern scientific foundations in the field of sports, which has greatly influenced the level of performance and achievement in all activities and sports, including the game of volleyball with its offensive and defensive skills, and the overwhelming skill is one of the offensive skills that the team can score directly Or indirectly through it, so you need an evaluation based on modern scientific foundations based on the results of the kinematic analysis.

Keywords: *kinematic analysis, modern scientific foundations, volleyball*

I. Introduction:

The study and analysis of the skill or parts of the movements of that skill kinematically helps in reaching accurate objective results by diagnosing the pros and cons of skill performance and achievement from the biomechanical aspect, and to fully study the essential aspects of the movement or skill requirements, we must move away from the subjective values in evaluating the movements Because the scientific sources emphasize the basic aspects to be studied, which are related to time and distance of movement, the path of the body mass center and the angular velocity of the parts affecting performance and achievement.

Studying the correlational relationships between the three stages of the high spiking volleyball hitting helps coaches and specialists to identify accurate numerical values through which they can evaluate the differences between players in skill performance. All stages of performance of the high spiking skill are related to each other, as the values of the second stage are affected by the values of the stage The first is also influenced by the values of the third stage by the values of the second stage. Therefore, the research problem is summarized in studying the precise details of the parts of the movement through the interrelationships between the three stages (approximate steps, flying, hitting the ball) and the goal of the research to:

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- Identify the relationship between the horizontal velocity of the approximate steps and the angular velocity of the two arms in the weighted at the maximum height of the high spiking volleyball player

- Learn the relationship between the maximum height of a player in the flying stage and the angle of departure of the ball in the skill of spiking high in volleyball.

- Identify the relationship between the angular velocity of the forearm and the launch velocity of the ball in the ball hitting stage of the high volleyball spiking skill.

II. Research methodology and field procedures:

Research Methodology:

The researcher used the descriptive approach because it is the most appropriate approach to the nature of the research problem.

Research community and sample:

The community and the research sample are represented by the Al Jaish Sports Club players in volleyball within the Elite League clubs for the year (2020-2021). The two free players, the maid, and three players have a center, and a player uses the left hand because the nature of the search depends on the high spiking players from the position No. (4), as their percentage is (42.86%) of the original community of (14) players, and they represent (100%) From the Army Sports Club's high spillover community.

Devices, tools and means of gathering information:

Devices used in the research:

- A Japanese-made CastioExilim Ex-FHZO video camera

(2) speed (120) images per second + tripod.

- (1) Japanese-made (Sony) video camera with (25) speed.

Photo per second with a tripod.

- Computer (Laptop) type (DELL - INSPIRON - 1440)

- A program for analyzing movements and extracting results (KINOVEA)

Tools used in the research:

- A legal volleyball court with a net height of (2.43 m) and count (10) balls.

- Colorful adhesive + labels

- A wooden desk to put appliances on, with a chair and mattress (1).

- A handy electronic calculator, number (1) of the Korean-made Caston type.

- A metal tape to measure length (5) m. The measurement unit is centimeter.

- LED lights placed on the players' joints.

Methods for gathering information:

1. sources.

2. Information network (the Internet).

3. Observation, experimentation, testing and measurement.

4. Helping staff.

5. The research sample data registration form.

Field research procedures:

Exploratory experience:

The researcher conducted an exploratory experiment on two players for the crushing high of the Army Sports Club in the hall of the Armenian Club on Tuesday 10/6/2020 in order for the researcher to stand on the biochemical variables of spiking, as well as the ability of the assistant work team to control the testAs well as identifying the field difficulties that may face the researcher during the implementation of the main experiment, as well as determining the distance and height of the cameras, as well as the location of the drawing scale, as well as determining the appropriate lighting for photography and knowing the time required for the test procedures and its implementation.

The main experiment:

The main experiment was conducted on Tuesday 10/13/2020 in the closed hall of the Armenian Club in Baghdad and with the help of the assisting team of (6) players in the field of high crushing hitting center (4) of the Army Sports Club in volleyball, as the number of correct attempts reached (30) attempts by (5) successful attempts for each player. The best attempt of each player was analyzed by the highest starting speed of the ball out of the five attempts.

Statistical methods:

For the purpose of processing data statistically, the researcher used the statistical bag (spss) to process the data obtained, as the following was used:

- Arithmetic mean

- standard deviation

- Mediator

- Coefficient of torsion

- Pearson simple correlation coefficient.

III. View and discuss search results:

Presentation of the results of the mean and deviations, the value of the correlation coefficient, the percentage of error, and its significance for the variable of the velocity of the horizontal distance in the stage of approximate steps and the maximum height of the body mass center in the stage of flight and discussing them.

Table (1) shows the arithmetic mean, standard deviations, the value of the correlation coefficient, the error rate, and the significance of the variable of the horizontal velocity of the approximate steps and the variable of the maximum height of the body mass center

Statistical processors Variables	Arithmetic mean	standard deviation	Correlation coefficient value	mistake percentage	Significance
The horizontal velocity of asymptotic steps	**1.988**	**0.147**	**0.703**	**0.186**	Non-sign
Maximum height of the body mass center	**0.726**	**0.129**			

It is evident from Table No. (1) that the value of the correlation coefficient is (0.703) between the horizontal velocity of the approximate step phase with the maximum height of the body mass center in the flight phase if the significance of the relationship is not significant for the research sample, which is evidence of a weakness in the velocity of the approximate steps and generated from the force of the explosive For the muscles of the lower extremities (the legs), and since the main goal of the approach stage is "to achieve a great speed through the three steps in which the player can achieve a better use of momentum. This means a change in momentum and the horizontal velocity transformed into momentum and vertical velocity, which allows and helps to jump as high as possible." (113: 1).

Table (2) shows the arithmetic means, standard deviations, the value of the correlation coefficient, the error rate, and the significance of the variable of the angular velocity of the arms and the variable of the maximum height of the center of body mass

Statistical processors Variables	Arithmetic mean	standard deviation	Correlation coefficient value	mistake percentage	Significance
The angular velocity	**589**	**44.064**	**0.531**	**0.357**	Non-sign

of the arms in the approximate stage					
Maximum height of the body mass center	**0.816**	**0.219**			

It is evident from Table (2) that the value of the correlation coefficient is (0.531) between the angular velocity of the two arms during the weighted in the approximate steps stage with the maximum height of the body mass center in the flight phase if the significance of the relationship is not significant for the research sample, which is the evidence for not using the explosive force for the arms weighted It helps in pushing towards the top when the movement is integrated with the knees extending with the end of the pushing stage and leaving the ground, and scientific sources indicate that "the weight of the arms participates by (21%) of the height of the jump or [jump] total" (50: 2).

Display the results of the mean and deviations, the value of the correlation coefficient, the percentage of error, and its significance for the variable of the maximum height of the body mass center in the stage of flight and the variable of the starting angle of the ball in the stage of hitting the ball and discussing it.

Table (3) shows the arithmetic mean, standard deviations, the value of the correlation coefficient, the error rate, and the significance of the variable of the maximum height of the body mass center and the starting angle of the ball

Statistical processors Variables	Arithmetic mean	standard deviation	Correlation coefficient value	mistake percentage	Significance
Maximum height of the body mass center	**0.816**	**0.219**	**0.649**	**0.236**	Non-sign
Ball launch angle	**28.500**	**2.093**			

It is evident from Table (3) that the value of the correlation coefficient is (0.649) between the maximum height of the center of mass of the object in the stage of flight and the angle of departure of the ball in the stage of hitting the ball. The presence of a higher column jump and the weakness of the vertical height when the research sample resulted in the results of non-significant relationships.

Table (4) shows the arithmetic mean, standard deviations, the value of the correlation coefficient, the error rate, and the significance of the angular velocity variable of the forearm and the ball launch velocity variable

Statistical processors	Arithmetic	standard	Correlation	mistake	Significance

Variables	mean	deviation	coefficient value	percentage	
The angular velocity of the forearm	**786.600**	**93.722**	**0.686**	**0.289**	Non-sign
Ball launch velocity	**22.050**	**3.159**			

It is evident from Table (4) that the value of the correlation coefficient (0.686) between the angular velocity of the forearm in the stage of hitting the ball with the starting velocity after hitting it if the significance of the relationship is not significant for the research sample.

The bending and stretching movements in the aiming arm movement mean an increase in the angular velocity of the arm and thus the amount of movement that is transmitted to the ball increases. Moreover, the starting point for the player also has an effect on the launch speed of the ball, i.e. it works to extend the body to the player and thus to an increase in the launch speed of the ball .

IV. Conclusion:

In light of the results reached, the researchers concluded

- The apparent weakness in the variable of the horizontal velocity of the approximate steps and the angular velocity of the two arms in the weighted negatively affect the values of the vertical height as the indication was not significant, which indicates the weakness of the horizontal velocity and the angular velocity of the two arms in the weighted.

- The values of the correlation coefficient of the variable of vertical height with the starting angle of the ball appeared in the stage of hitting the ball, in terms of insignificance for the research sample due to the weakness of the vertical height values affected by the weakness of the horizontal velocity and the angular velocity of the two arms in the phase of approximate steps.

-The apparent weakness in the values of the angular velocity of the forearm in the stage of hitting the ball negatively affected the variable velocity of the launch of the ball after hitting it if the significance of the relationship was not significant.

And based on the results of the research and its conclusions, the researchers recommend the following:

- The necessity to develop the approximate steps speed and the weighted speed of the arms through the development of exercises to develop the explosive force of the legs and arms to directly affect the height of the column in the flight stage and thus increase the values of the starting angle of the ball, as well as developing special

exercises to develop the speed of the striking arm, specifically the angular velocity of the forearm for its direct effect in increasing the speed The ball launches.

- Conducting analytical studies of kinematic variables, especially for the skill of overwhelming multiplication, before and after applying the training curricula to identify the values of the kinematic variables related to the performance of the skill.

- Conducting similar analytical studies on other variables that contribute effectively to column height, ball velocity and accuracy in the high spiking skill.

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