

A COMPARATIVE STUDY OF SOME KINEMATICS VARIABLES AFFECTING THE EFFECTIVENESS OF JAVELIN

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ABSTRACT

The effectiveness of javelin throwing is one of the competitions with complex technical performance and requires special physical and motor abilities

Which should be performance at the highest level of control of their biomechanical variables so the researchers used the analytical descriptive method, and the researchers chose the research sample in a deliberate manner, and consisted of the champion of Iraq for the effectiveness of throwing the spear for the year (2019) m and the second place in the same tournament, The researchers used to shoot the final stage of the shooting process in addition to the first section of Al-Ramah flight for the research sample during the main race on Friday, 8/3/2019 at 3:00 pm. The researchers used one Panasonic camera with 120 speed / Triangular, proved by ja (1.30) meters, and is located from the middle of the width of the field of approach to a distance of (6.30) meters, to be vertical on the middle and at the height is vertical to the bearing of the shaft and the javelin is recorded, and the mechanical analysis on the attempted achievement Better and The authors reached several conclusions, including several conclusions and The high starting speed of the hero of Iraq is the main variable that achieved the greatest distance and There were a number of recommendations. The most important of these was the attention to the height of the starting point of the hero of Iraq if he had achieved a point of departure (2.35) m, the same value achieved by Rami Karar Raad Mohi to the height of the starting point of the spear had a distance of throw up to (75.34) m.

Keywords: comparative study - kinetic variables – javelin.

INTRODUCTION

Biomechanics is one of the most important core sciences and assistance in the training processes. The course of this process is explained by the fact that he has entered extensively in the field of training to perform various skills, especially digital ones. His studies focused on identifying the critical and relevant points in the development of performance, For the mechanism of interpreting the performance of players based on the various analyzes, which enable the trainers to identify the joints of important movements and work through the development of the player's performance, and through the laws of physics and applied to the movements of the body of the sport, Which should be performed correctly,

by understanding the paths of motion, studying them analytically, and finding out the most appropriate performance conditions.

That athletics activities require special physical and motor abilities, in which performance must be at the highest level of control for their biomechanical variables. The rapid development of athletics events, particularly the javelin effect in the world, has been the result of the use of state-of-the-art technology and laboratory research tools To study the minutes of parts of the movement and discover the mistakes and try to overcome them by finding the correct motor path that enables the Rami to exploit his own strengths to resist external forces, that is, the use of body parts and move

them according to the information system and For successive performance.

And the investment of mechanical foundations and principles important to the effectiveness of throwing the spear to the process of throwing through the transfer of all gained by the player movement and all the effort of muscle before the disposal of the spear and during the disposal of the spear and both stages controlled by the body parts of the player through the correct mechanical position and angles and heights and dimensions of these The parts to achieve the motor duty and the mechanical goal is in throwing as far as possible and the final throwing stage in the spear-throwing contest is the basic technical stage to judge the achievement of the goal of the level of performance, which is increasing speed from the moment of the double corner until the stage of Alt The importance of research in this analytical study of the hero of Iraq in the championship of clubs and institutions of Iraq, which ranked second in the same

tournament to identify the most important mechanical differences in the final status of throwing and its relationship to the achievement achieved.

MATERIALS AND METHODS:

Research Methodology:

The researchers used the analytical descriptive approach as it provides facts, data and accurate information about the reality of the phenomenon to be studied, as well as explain and explain the relations between different phenomena such as the relationship between the causes and results and the relationship between the whole and the part.

Search community and sample:

The researchers selected the sample of the research in a deliberate way, and consisted of the champion of Iraq for the effectiveness of throwing the spear for the year (2019) m and the second place in the same tournament.

Table (1)
Specifications of the research sample

Training age	Shoe size	Bloc	Length	Births	The name
7 Years	44 cm	83 Kg	183 cm	1992/4/26	Karar Raad Mohi
9 Years	44 cm	82 Kg	185 cm	1995/8/25	Younis

Means of gathering information, tools and devices used in research:

Data collection methods:

- .Arab and foreign sources -
- .Remark and analysis -
- .Tests and measurements -
- .Software and applications used in kinetic analysis -
- :Devices and tools used
- Fast Camera (1) Casio / Chinese tray / up to 120 frames / s to 1000 frames per second / with three camera holder (1)
- .Tape measure -
- .Balance for mass measurement -
- .Computer (Laptop) type (DELL -
- .Electric car -
- Drawing scale (1 meter) number (1) -
- Legal shaft number.

Field research procedures:

- The speed of starting the spear: the speed of starting the spear The moment of leaving the hand of the rami This variable is calculated by determining the image of the distance traveled by the center of the weight of the spear after the moment of departure directly to (10 pictures) to get the real distance and calculate the time of this transition and by dividing the distance on Time we get the speed of the instantaneous departure.
- Spear starting angle: The starting angle of the spear (the spear) confined between the horizontal line passing from the center of the weight of the spear and parallel to the ground during the start of flight and the path drawn by the center of the weight of the spear during (10 photos).
- The height of the starting point of the spear: the vertical distance of the center of the weight of the spear on the ground for the moment of its launch.

- Direction angle: the angle confined between the long axis of the shaft before starting from the hand of the player with the horizontal line passing from the center of the mass of the mass of the shaft parallel to the ground.

- Angle of attack: the difference between the angle of direction and the starting angle.

:Racing Photography

The two researchers filmed the final stage of the shooting process in addition to the first section of AI-

RESULT AND DISCUSSION:

Ramah flight of the research sample during the main race on Friday, 8/3/2019 at 3:00 pm. The researchers used one Panasonic video camera with a speed of 120 images, (1). It is located at the center of the width of the field of approach at a distance of (6.30) meters, being vertical to the middle (the average distance of the throw of the last step) and the height is vertical to the bearing of the shaft The javelin was recorded, and the mechanics were analyzed On the best-performing attempt.

Table (2)

Shows the kinetic parameters of the shaft of the research sample

Karar Raad Mohi	Younis	measruing unit	Mechanical variables	sequence
27.30	28.40	M / sec	The starting speed of the spear	1
33	34	Degree	Spear starting angle	2
38	33	Degree	Direction angle	3
5	1-	Degree	Angle of attack	4
2.35	1.87	meter	High spear starting point	5

Table (2) shows the kinetic variables for the shaft of the research sample. The value of the variable is the spear speed of the champion of Iraq (28.40 m / s) and the Rami Karrar Abdul Karim (2730 m / s). In this regard, HAY (1985) states that the speed of the spear is the important factor in determining the distance to which the spear reaches. After this, the increase in the speed of the spear will lead to a large increase in the distance of the spear and on this basis must direct the main effort Aiming to develop the art of javelin movement, which is performed as fast as possible for the shaft at the start The speed of the final spear is determined by the speed of the horizontal speed obtained by the spear during the course of the rotation and the dynamic sequence of the movement during the final steps of the performance of the movement of the player from the body of the player to the arm and then to the spear, as the continuation of the thrower full speed gained during The training course is the basic mechanical variable in the speed of the spear launch. In addition to the correct position of the body parts during the preparation for throwing and throwing, and the emphasis on the absence of a stop in the movement of the body parts during performance, and the effectiveness of the work of the muscles of the lower

limbs and especially the man of reliance and effectiveness In Ttthbyt the bottom as it is in the body rotation stage forward and lead to the speed of the upper part where he tries to Bowler transfer this speed to the arm that holds the spear, all these factors contributed to making cruising speed for the champion of Iraq's biggest and thus obtaining the completion of the best. The steps and stages of throwing rings are interconnected to achieve the best position to throw and get the best position for payment and achieve the angle and speed of starting appropriate, because the investment of all the mechanical variables obtained by the body during the approach as fast and the force of the rush to be transferred to the spear must be completed at the right angle of the appropriate to achieve the best distance , And by tracking the starting angle of the shooters in the table above we note that they were able to achieve the ideal throwing angle of (30-40) degrees), due to the effectiveness of the application of the requirements of the Bayomikanih appropriate parts of the body and appropriate angles taken by the thrower (Javelin), which effectively contributes to the application of the correct corner of the spear starting, which is one of the effective kinetic indicators to obtain

a perfect path and correct for starting, which in turn increases the range of spear flight as well as the flight arc without disturbing the other kinetic variables. This means by observing the values of starting angle of the two heroes that they have the ability to determine the ideal starting angle by determining the value of the vehicle speed vertical and horizontal correctly, where the shooter during the moment of throwing to convert part of the vehicle speed horizon Of the vehicle vertical fit the nature of efficiency concerned and the final impact of her as this is the vehicle that determines the speed of the start of the spear as well as the launch angle.

For the variable angle of direction, the researcher found that the value of the two heroes is within the normal level of this angle compared to the starting angle. To obtain a high result when starting the spear and at an angle of 30-40 degrees, the final voltage must be compatible with the longitudinal axis of the tool, The value of the spear angle is the best angle. The higher the angle of the direction, the greater the area of the spear to resist the air during the climb, thus weakening the speed and thus the distance of the shot. In this regard, Karl Hans Josephs and Schrother (1980) "The shooters are submissive The level recorded a angle of direction greater than (7) from the starting angle."

The angle of attack is a return to the results of both the 1994 (1994) and the 1983 Couns (1994), which stated that "in order to achieve the best throw distance, it is recommended that the difference between the starting and moving angles is very low in order to obtain the best angle of attack". This was confirmed by Totgushan (1995): "The less the difference between the angle of direction and the starting point, the greater the distance of achievement", where the angle of attack for the hero of Iraq was better because the angle of direction was a little distance from the starting angle.

As for the height of the starting point of the spear, which gives the advantages of obtaining an extra horizontal distance because the height of the starting point of the kinetic variables that affect the achievement. In this regard (Qassem Hassan and Iman Shaker) that "the extension of the body for the moment of throwing and effectively affect the launch of spear" (1.87) m, it is less than the starting point of the second place (2.35) m, but the most important variable that determines the distance to reach the spear is the speed of departure and this is the variable between the first and second In the achievement, even if the thief U Ns (champion of Iraq) at the same height as the starting point of Rami Karar Abdul Karim as they have the same length of the body will be the completion of Yunus (75.34) m according to the mechanical equation:

$$D = \frac{v^2 \times \sin \theta \times \cos \theta + v \times \cos \theta \times \sqrt{(v \times \sin \theta)^2 + 2 \times g \times h}}{g}$$

CONCLUSIONS:

- The high starting speed of the hero of Iraq is the main variable that achieved the greatest distance.
- The starting angle for the two champions is within the optimal range of (30-40) degrees.
- The angle of the trend of the hero of Iraq was ideal for the angle of departure either Rami Karar Raad Mohi also was within the ideal but great.
- The angle of attack for the hero of Iraq was worth the negative and this means that the spear to less resistance to air during the launch, while Rami Karar Raad Mohi was worth (5) degree and this result because of the large angle of direction has.

- The height of the starting point for the hero of Iraq is not good but good for Rami Karar Raad Mohi, as this variable is one of the variables that affect the distance of the throw but the superiority that happened to the hero of Iraq was the result of the speed of departure is the most important variable in determining the distance of the throw.

ENDORSEMENT:

- Interest in the height of the starting point of the hero of Iraq if it had achieved a starting point (2.35) m, the same value achieved by Rami Karar Raad Mohi to the

height of the starting point of the spear was a distance to throw up to (75.34) m.

- Paying attention to increasing the speed of the launching of the Karar Raad Mohi as the most important variable in determining the distance of the throw.
- The less the difference between the starting angle and the direction angle, the better and thus the spear is exposed during the flight to less resistance to air.

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