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An Analytical Study of some of the Kinematic Variables of World Champions with Long Jump (Daegu) in South Korea (2011)

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Abstract--- *The research aims to know that any sporting achievement requires knowledge of many mechanical and influencing factors, and failure to achieve is due to neglect of some factors, and this is why achievement is one of the most difficult things facing sports training in its field. The effectiveness of the long jump is from activities that have its own technical and physical requirements starting from the speed of the projectile (here the player's body is the projectile) to the starting angle and body position and the correct mechanical connection of these variables. The jump competitions entered into the Olympic representation and that since the year (1896). The first modern Olympics in Greece, and the tracker of global sporting achievements sees that sport is in a permanent and continuous development, and the effectiveness of the long jump has received attention to The experiences, which helped us to find the most important factors that, must be taken care of focus on to raise. The level of achievement towards a better. Kinetic analysis used to determine the level of performance of movements and mathematical skills of players accurately and through which the values of the kinematic variables; can be extracted and compared with typical kinematic variables, knowing the strengths and weaknesses in the player's performance and contributing to adjusting this performance for the better. The research problem were noted differences in the level of achievement for the players, the long jump as compared to men cause lack of linkage between these variables under study during the performance. Which was formed first, the omission of some trainers for training-related aspect of physical Secondly. The lack of adequate attention to the analysis motor for the players felt that the researcher studies a comparison of some variables kinematics to accomplish the global men and women's championship (Daegu) in South Korea (2011) to be a good model for the kinetic model for both sexes, and to know the strengths and weaknesses they have.*

Keywords--- *Kinetic Analysis, World Champions, Long Jump.*

I. INTRODUCTION

Athletics is the bride's world of sports, including the various classes of special motor skills and fitness elements; such as speed, strength, endurance, flexibility, etc. The characterized by an assessment of human achievement as levels translate into times in field activities, and to distances and heights in square events, as well as they give an indication Honest about the individual's ability and capabilities to develop these capabilities to achieve the goals and requirements of the event in accordance with its various technical stages. Muhammad Othman divided it in to:

Approaching the higher start position. This type of start provides the process of selecting the most appropriate steps for approaching. These various factors must be done with an important consideration in each of them, which is access to the real foot-up plate for the upgrading and with the full accuracy that is required that the instep be

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complete over the board.

The most difficult of the jumping problems, as it requires providing many obligations that can be summarize. The factors that influence the long horizontal long jump distance are the approaching speed and the upgrading process. To the first two stages, reaching the maximum speed was call the acceleration stage. These steps were distinguish regularly in their rhythm, and the number of steps is control in the distance traveled. The second stage is the last four steps of approaching.

Upgrading: The primary goal of upgrading is to obtain the necessary thrust force to push the body forward and upward. Which begins with the beginning of the hitting foot of the upward hitting of the upward pad and ends with leaving the plate along the joints of the foot, knee and pelvis, the purpose of this stage and experiments indicate that the elevation angle should reach 20 - 24 degrees so that access to the appropriate angle of elevation can be secured during flight (1). The key to success in long jump is the amount of correlation between the last three steps of approaching speed with the moment of foot descent in preparation for the stage of rise. So that the foot contact time with the ground is less mim. The upgrade considered the most important and most difficult of the technical stages of the long jump, which increases the difficulty of the amount of ability to convert similar movements, which were used in the process of approaching to the movements that are not similar and that are used for elevation and flight. It is an extended stage for it.

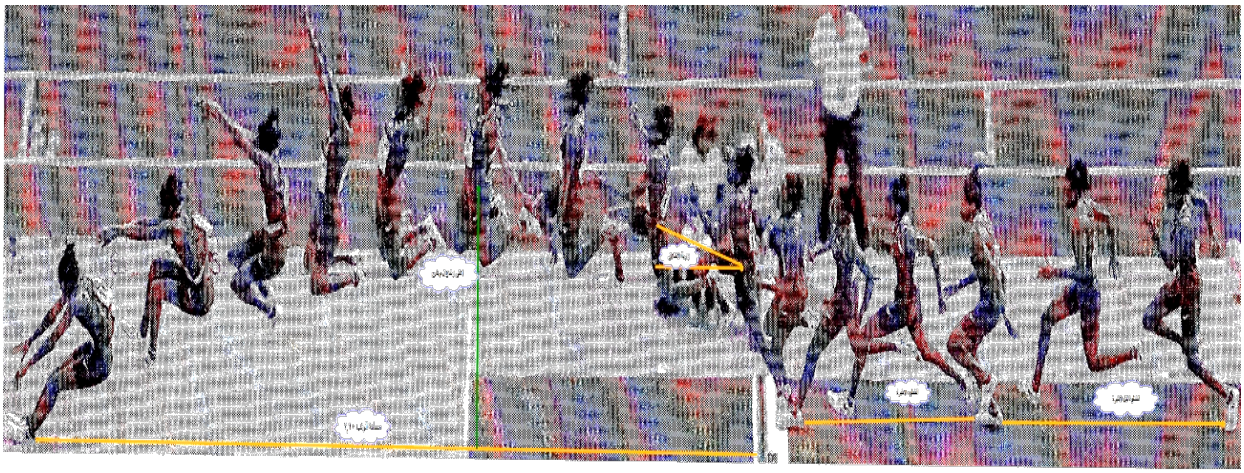

Figure 1: Analysis of the performance skills of the world champion (Reese), which proved to 6.82 in the Championship (Daegu) South Korea 2011

Flying: During the flight stage, the vertical position of the body must be preserve. In this stage, more conditions that are favorable arise to move the two men forward to perform the landing stage and different movements can performed in the flying stage immediately after the upgrade from the elevation plate and to take the necessary position for landing. The shape of these movements determines the way of jumping attachment, walking, squatting (step) and each of these methods have their pros and cons. Muhammad Othman states that the method of walking in the air has proven more effective than other methods (6.9) seconds.

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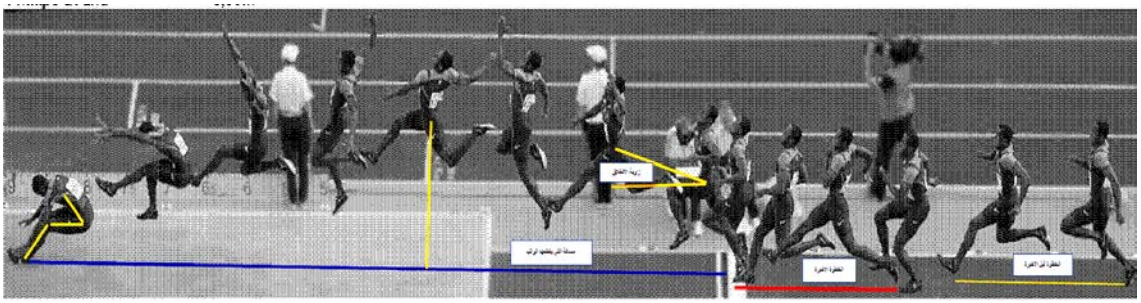

Figure 2: Analysis of the performance skills of the hero of the world (Phillips), who bounced (8.45) in the Championship (Daegu) 2011

Landing: The landing process begins primarily with the feet being facing the ground behind the imaginary point of the flight curve of the center of gravity of the body; and when the two men gather to the farthest distance upon landing. It should not be urgent in the process of landing and extending the legs in the knee joint, because such a premature movement is difficult to maintain the high horizontal position of the two legs.

II. MATERA'S AND METHOD

1. The research sample:

The research sample was chosen intentionally, and they are (8) players from the world champions who got first ranks in the wide jump race of the athletics championship in (Daegu) South Korea 2011. The camera was at a speed of (200) images per second, and the information obtained by it. It was analyze by the (Dartshuff) program with the sequential pictures of performance for all competitors.

2. The means of data collection:

1. Arab and foreign sources and references.
2. Notes and Analysis.
3. The assistant work team.
4. International Athletics Federation magazine.
5. The International Athletics Federation website www.Iaaf.com

3. Statistical means

The statistics use

- Arithmetic mean.
- Standard deviation.
- Correlation test to determine correlation and correlation significance (1).

Results and Dissection The distance lost: The arithmetic mean for the men world champions (0.53) and standard deviation (0. 38), while the arithmetic mean of the women heroes of the world (0.52). In addition, standard deviation (0.48). The value of T calculated (0.04) was less than the value seriously. The Mechanism of (1.3) below the level of freedom (7). The level of significance (0.01) this indicates; there is no significant differences were statistically significant (random) and is clear evidence. that the step sprint and upgrade was performed perfectly in line with the potential physical and exploitation of mechanical optimization of these two variables mechanics of the

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short sprint touching the steps of the board and the fact that they were world champions in this event.

The length of the first step of the last three steps: The arithmetic mean of jump the men world (2.21) and standard deviation (0.12). While the arithmetic mean of jump champions of the women world (2.09) and standard deviation (0.12). The value of (t) calculated (1.9), the largest of the value of (t) indexed, amounting to (1.3) under the degree of freedom (7) The level of significance (0.01) therefore, difference significant in favor of men due to differences in the specifications for physical sample and for men in the lengths of the parties as well as physical force.

The length of the second step of the last three steps: The arithmetic mean of jump the men world (2.44) and standard deviation (0.16). While the arithmetic mean of jump champions of the women world (2.31) and standard deviation (0.17). The value of (t) calculated (1.5), the largest of the value of (t) indexed, amounting to (1.3) under the degree of freedom (7). The level of significance (0.01) It is also for the world champions of the men is a shift from approaching to upgrade one of the most important parts of the method performance of the long jump take sports during the last two steps of approaching a series of changes in the status of the body in preparation for the upgrade when the athlete with a high level and can be diagnosed following a decline as much as 4 cm in the high center of gravity of the body on impact and increase of (5-7 cm) at a distance of landing at the end of the second step the last (1).

Table 1: Represents the results of the long jump world championships in Daegu, South Korea, March (2011)

Variables	women		Men		calculated value of T	T. spreadsheet 0.01 in terms	Significance
	The mean	standard deviation	The mean	standard deviation			
Official distance	**6.64**	**0. 17**	**8.25**	**0.18**	**16.2**		Moral
Distance lost	**0.052**	**0.049**	**0.053**	**0.038**	**0,04**		Random
The length of the first step	**2.09**	**2.09**	**2.21**	**0.12**	**1.9**		Moral
The length of the second step	**2.31**	**0.17**	**2.44**	**0.16**	**1,5**		Moral
The length of the third step	**2.10**	**0.18**	**2.30**	**0.08**	**2.85**		Moral
Speed of the first step	**9.32**	**0.18**	**10.39**	**0.19**	**11.8**		Moral
Speed of the second step	**9.49**	**0.26**	**10.58**	**0.26**	**8.24**		Moral
Speed of the third step	**9.38**	**0.27**	**10.46**	**0.23**	**3.7**	1,3	Moral
Speed vertical takeoff	**3.53**	**0.26**	**3.15**	**0.39**	**2.23**		Moral
Angle of departure	**21.7**	**2.28**	**21.9**	**3.09**	**0.13**		Random
Angle of inclination of the trunk takeoff	**25.6**	**2.7**	**26.4**	**2.4**	**0.58**		Random
Knee angle at landing	**145**	**10.91**	**141**	**10.03**	**0.71**		Random
Angle of inclination of the trunk at landing	**73**	**8.71**	**75.6**	**21.3**	**0.30**		Random
Landing distance	**0.49**	**0.031**	**0.52**	**0.12**	**21.9**		Moral

The length of the third step the last moment before the upgrade

The arithmetic mean of men jump the world (2.30) and standard deviation (0.08). While the arithmetic mean of jump champions of women the world (2.10) and standard deviation (0.18). The value of (t computed 2.85. The largest of the value of (t) indexed; amounting to (1.3) under the degree of freedom (7). The level of significance (0.01) when taken jump of the situation. which will facilitate the access to live up to the front foot after taking three

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steps before the last attainable of the board in the last steps is happening down in the hip down making it easier to prolong this step a distance estimated at (22.7) cm longer than the last step and we must take into account that the last step is not remarkably short at the same time fast, as the analysis of the three steps Last among the players for the Champions any change for steps to approach the other, except in rare cases and that this change cannot be seen with the naked eye in the case of presence **(1:292)**

Speed of the first step of the last three steps

The arithmetic mean of jump the men world (9.32) and standard deviation (0.19). While the arithmetic mean of jump champions of the women world (10.39) and standard deviation (0.18) The value of (T) calculated (11.8), the largest of the value of (T) indexed, amounting to (1.3) under the degree of freedom (7) The level of significance (0.01) where is the speed of the basic factors affecting the distance jumping, this is clearly. Evident that the speed step for men greater than for women Speed of the second step of the last three steps the arithmetic mean of jump the men world (9.49) and standard deviation (0.21). While the arithmetic mean of jump champions of the world (10.52) and standard deviation (0.26). The value of (t computed 8.24), the largest of the value of (t) indexed, amounting to (1.3) under the degree of freedom (7). The level of significance (0.01) the speed of the second step of the men and women less than tenths of second for both groups and passed naturally vary speed in the three recent steps. The process that convert horizontal speed into vertical velocity requires. The loss of horizontal speed and practical training for the world champions take into account the reduction of the speed lost in the three steps to the latter through the duplicates ; the correction of the variables of mechanical center of gravity of the body ; the angle muscle work of the Parties Speed of the second step of the last. Three steps of arithmetic mean passed naturally vary speed in the three recent step. The process that convert horizontal speed into vertical velocity requires the loss of horizontal speed; practical training for the world. Champions take into account the reduction of the speed lost in the three steps to the latter through the duplicates and the correction of the variables of mechanical center of gravity of the body and the angle muscle work of the Parties the world (9.49) and standard deviation (0.21). While the arithmetic mean of groups and passed naturally, vary speed in the three recent steps. The process that convert horizontal speed into vertical velocity requires the loss of horizontal speed and practical training for the world champions take into account. The reduction of the speed lost in the three steps to the latter through the duplicates and the correction of the variables of mechanical center of gravity of the body and the angle muscle work of the Parties champions of the men world (10.52) and standard deviation (0.26). The value of (t computed 8.24), the largest of the value of (T) indexed, amounting to (1.3) under the degree of freedom (7) The level of significance (0.01) the speed of the second step of the men and women less than tenths of second for both groups and passed naturally vary speed in the three recent steps the process of converting the horizontal speed to the speed of Requires the loss of vertical and horizontal speed the training process for the World Champions take into account the reduction of Quickly lost in the last three steps through the duplicates and the correction of the mechanical variables of the Centre for The value of (T) calculated (3.7), the largest of the value of (T) indexed, amounting to (1.3) under the degree of freedom (7) The level of significance (0.01) note in the results of the speed of the last step is faster than the second step for men and women and this indicates that both groups are of the heroes of the world possess the physical attributes high prevented through reducing the speed lost to the steps the last three as the length of the

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step does not of the speed of the last step where it is proved that step before the last increase in length by 20 cm from the step that precedes and the next and through this change is reduced center of gravity of the body. " the speed and force to the two fundamental role in determining the value of the capacity that is different from effectiveness to the other as the process of upgrading in the long jump is against considerable resistance depends on the strength of more than technical performance, which is against little resistance, which depends largely dependent on the speed larger **(5:144)**.

Vertical velocity of takeoff:

The arithmetic mean of jump the world (3.15) and standard deviation (0.26). While the arithmetic mean of jump champions of the world (3.53) and standard deviation (0.39) the value of (T) calculated (2.23). The largest of the value of (T) indexed, amounting to (1.3) under the degree of freedom (7) the level of significance (0.01) in the performance of movement of advancement or upgrade. Which consists of a stage touching the ground, leave the angles approach, and pay importance in judging the performance or the health of his mistake. If increased approach angle is the angle between the lines connecting the center of gravity of the body .The Moment of foot touching the ground with the horizontal line passing from the foot of the land of the urgent (7:179). It means that the distance between the center of gravity of the bodyline of gravity will be reduced and consequently. The determination of weight as a crippling be small and thus leads to the reduction of the voltage on the working muscles and therefore the value of momentum is the best which provides the opportunity to be a payment maximum of what can and thus there will be a perfect performance and smooth. The speed of the center of gravity at takeoff and high center of gravity for the takeoff and a space upgrade and speed upgrade and the distance. Legal was significant because of the Abolition of the world are superior in many physical attributes and performance of the technique right. The power in the lower limbs, which make them distinct from heroes of the world.

Especially in the handling of the board Angle of departure was the arithmetic mean of the world men jump (21.9) degrees and standard deviation (3.09). while the arithmetic mean for the women world champions jump (21.7) degrees and standard deviation (2.28) The value calculated is 0.13, the smallest of value spreadsheet of (1.3) under the degree of freedom (7) The level of significance (0.01) to take the right angles in the joints of the hip and knee means taking the situation the mechanical in the joints of the hip and knee means taking the situation the mechanical proper moment touched and leave the land, which means reducing the torque resistance (torque) but if I said these angles the normal limit it causes in the departure center of gravity of the body from the line of gravity and because of that be increased torque resistance of the body as that of the angles a clear impact on the low and high center of gravity of the body in moments of build. As that of the muscles involved have an impact on the joints of the knee and hip, which can be developed through the application of the correct motor performance. An increase or decrease the angles related to increasing lengths of leg and thigh bone, and this causes an increase moment of inertia consistently block.

According to the following formula: moment of inertia = body mass × square of the height

The body's center of gravity of 18°-23° degrees and notes that the ideal angle of purely mechanical point of the discharge with the speed of advancement. Do the natural world champions ranged between (18°-23°) and the degree

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of distance from the jump (4.57 to 8.80) respectively use calculated by (41°-43°) degree angle as that. The ideal angle of the projectile increases the flight time to be has the ability to achieve large angle without sacrificing the great speed and to increase the horizontal distance. In the fourth quarter must be rounded or the lifting of parts of the body around the center of the weight of the body. So that the feet farther forward than the center point of the weight of the body Angle of inclination of the trunk takeoff. The arithmetic mean of the world jump (25.6°) degrees and standard deviation (2.7). While the arithmetic mean for the world champions jump (26.4°) degrees and standard deviation (2.4). The value of (t computed 0.58), the smallest of the value of (t) indexed, amounting to (1.3) under the degree of freedom (7) The level of significance (0.01) and that increasing the angle of inclination of the trunk or lower takeoff have a significant impact on the situation to take the correct mechanical also, the lack of significant differences for the angle of trunk inclination to take the situation confirms the mechanical right that the sample under analysis are the world champions of women and men(1:134).

Knee angle at landing: The arithmetic mean of jump the world (141°) degrees and standard deviation (10.03). While the arithmetic mean for the world champions jump (145°) and standard deviation (10.91). The value of (t) calculated (0.71), the smallest of the value of (T) indexed, amounting to (1.3) under the degree of freedom (7) The level of significance (0.01) that found no significant differences of statistical significance also is a sign to take the situation the mechanical proper research sample because they were world champions.

Angle of inclination of the trunk at landing: The arithmetic mean of jump the world (75.6) and standard deviation (21.3). While the arithmetic mean of jump world champions (73) and standard deviation (8.71). The value of (t) calculated (0, 30), the smallest of the value of (t) indexed, amounting to (1.3) under the degree of freedom (7). The level of significance (0.01) .It is not that all angles body (trunk and knee and the angle of the body's center of gravity and the tendency of Trunk of the moment of departure and landing) was not significant moral and this shows the situation to take the correct mechanical and commensurate with the length of their body parts.

III. LANDING DISTANCE

The arithmetic mean of jump the world (0.52) and standard deviation (0.12). While the arithmetic mean of jump champions of the world (0.49) and standard deviation (0.031). The value of (t) calculated (21.9) which is the largest of the value of (t) indexed, amounting to (1.3) under the degree of freedom (8). and the level of significance (0.01) We note that the speed of the center of gravity at takeoff and high center of gravity for the takeoff and a space upgrade and speed upgrade and the distance legal was significant because of the Abolition of the world are superior in many physical attributes and performance of the correct technique

They also have the power in the lower limbs, which make them distinct from heroes of the world, especially in dealing with the board. As the important factor, affecting the distance of fall is to delay the arrival of the feet of the surface of the earth. Much as possible to take advantage of flight time resulting from the difference in the level landing departure. As well as affected hip or convergence between thigh and torso as much as possible so that it becomes the lower end closest to the level of the horizontal in order to reach the feet to the farthest possible distance to the moment of contact. With Earth and for a distance of landing a good player has to move his body a way. The makes the feet beyond what can be from the place center of gravity of his body by doing weighted arms back, such

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as the arrival of the feet of the land directly lead to the movement of the feet of the front of the maximum score possible (7:318).

IV. RECOMMENDATIONS

The need to develop new studies and programs for the kinetic analysis in order to find a global model to be able to improve and develop performance skills to optimize the effectiveness of the long jump and to address some of the weaknesses faced by the players performance.

- Given the great importance of the horizontal speed during the jump as being more important in determining the actual distance jump.
- The work of a similar study on different samples and other events in the data

REFERENCES

[1] Abdul-Zahra Abdel-Hamid Zahir: Physiology competitions jump and jump, i 1, the center of the book for publication, Cairo, 2000.
[2] James. Hay is a translation of Abdul Rahman bin Saad Anqari: Biomechanics of the methods of athletic performance, Riyadh Scientific Publishing and Press 2006 p. 292
[3] James Hay, J.The Biomechanics of Sports Techniques .second Edition , Prentice – hall, U.S.A.1978.p59.
[4] Hussein Mardan and Mohamed Abdullah: Advanced Statistics in Educational Sciences and Physical Education, and applications spss i 1 House Warraq Amman 2006.
[5] Hussein Mardan and Ayad Abd Rahman: biomechanics in the athletic movements, Najaf Press 2011.
[6] Sareeh Abdul Karim Fadhli: biomechanics applications in sports training and performance motor 2 nd Library of Baghdad, 2010.
[7] Talha Husam Alddin: Biomechanics, i 1, Cairo, Dar Al-Arab Thought 1993.
[8] Qasim Hassan Hussein. Shaker faith basis mechanical, analytical and technical events in track and field Amman house thought i 1 2000, p. 289
[9] Mohamed Othman; Encyclopedia of athletics, i 1, the House of Science for publication and distribution. Kuwait .1990 p. 335.
[10] Tan. A & Zumevchik. Kinematics of the long Jump. The physics Teacher. Second Edition 2000.147-149.

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