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An analytical study of some Bio-Kinematic variables in the stage of kicking the ball and the mechanism of controlling it when scoring to the goal from different situations of indoor Futsal

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Abstract

Scoring skill is of great importance mechanically, taking into account a lot of physical abilities and biochemical variables in order to achieve successful scoring in terms of changes that occur in the corners of the body parts when different scoring positions according to situations preceding this situation, For example, is the scoring position the same when performing scoring from the side handling with the scoring mode of rolling ball and movement? And what differences occur because of those cases. As well as researchers tried to find solutions and provide information on those cases and conditions to reach this skill to high performance, The aim of the study is to identify the values of some biochemical variables in the ball kicking and the mechanism of control when scoring on goal from different situations, as well as to identify the differences in the values of those variables in the research sample, As for the study methodology, the researchers chose the descriptive method in the survey method , In addition, the sample of the study was selected from some of the players of the futsal for the excellent degree, representing the clubs of the municipality and the south oil . as well as conducted the exploratory and main experiment and then the data extracted was processed by appropriate statistical means, and the results were presented and discussed, where the researchers reached a set of conclusions, including that it turns out that the players are working to increase the fold in The knee joint of the anchor leg in the moment of kicking the ball in the case of scoring from the side roll more than in the cases of scoring from the rolling or of handling, as well as showing that the players are working to increase the angle of the hip joint in the moment of kicking the ball in the case of scoring from handling more than in the case of scoring from the rolling back and the scoring from the side roll.

Keywords*: Bio-Kinematic, mechanism, indoor Futsal*

1. Introduction

The variety of scoring situations and how difficult these situations are in which this skill is performed is better present , This particular skill is of great interest to the experts and specialists in the field of physical biomechanics, who seek to analyze and interpret all the cases of the performance of this skill This science is not limited to the abstract description of the movement, but goes beyond that to analyze the skill qualitatively and quantitatively for the purpose of increasing the efficiency of players during the performance, Scoring skill has a great mechanical importance. This is what Savelsbergh and Bootsman referred to (1994). “Achieving successful scoring performance requires the mechanical conditions of kicking the ball in the right place and time for the correct application of the force going through the process of kicking” (4:1994). It takes into account a lot of physical abilities and bio-kinematic variables in order to achieve its desired goal,

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which is the ideal performance it also has a great role in resolving the results of the games and achieve the best level, which is performed from different situations However, studies and research may fail to determine what are the most important variables that are instrumental in achieving successful scoring, but it is almost rare to address the most important changes in the angles of the body parts when different scoring positions according to the situations preceding this situation, for example, is the scoring position the same when performing the scoring from the side handling with the scoring mode of rolling ball and movement? What are the differences that occur because of these cases? and as a result of the lack of studies and research that address this problem the researcher tried to find solutions and provide information on those cases and conditions to reach this skill to high performance, Highlighting some of the situations that lead the scoring skill in order to understand them more deeply and thus provide data and information, which makes it easier for coaches to obtain and apply during the training of their players on this important skill, by clarifying the most important variables that contribute to the success of the scoring of those Conditions, which is due to the evolution of teams and upgrade them to high levels in achieving better results in performance.

1.1 Objective of the study:

1- Identify the values of some bio-kinematic variables in the kicking stage and the mechanism of controlling them when scoring on goal from different cases in the futsal of the research sample.
2- Identify the differences in the values of some bio-kinematic variables in the stage of kicking the ball and the mechanism of control when scoring on goal from different cases in the futsal in the research sample.
3-

1.2 Study methodology and field procedures

Choosing methodology is very important in solving the study's problem (the descriptive method was the best way to do so), the research sample was chosen in a deliberate manner and they are some excellent players futsal in Basra and they represent the clubs of the municipality and oil south for the season 2019-2020 they are 10 players by (33.33%) of the original community of (30) players, in order to ensure the homogeneity of the sample in the variables that may affect the conduct of the experiment, the researchers conducted statistical treatment using the coefficient of difference and found that all values of the coefficient of difference It was less than (30%), which indicates the homogeneity of the research sample with the variables. The mean and standard deviation of the variable length (175.9 9.19) and the coefficient of difference reached 5.22%, while the mean and standard deviation of the mass variable (66.100, 6.17) and a coefficient of difference of 9.33%, and the mean and standard deviation of age (21.80, 0.918) and a coefficient of difference of 4.211%.Sources and references were used, as well as a video camera (1) type (Sonny HDR-XR520) with a frequency of speed (100 images / sec),computer type (hp core i7) the dynamic analysis program Dartfish Team Pro 5.5 is installed and(1) tripod . An exploratory experiment was conducted in order to identify the problems that will face the main work, as well as the dimensions on which the camera will be placed. The final shooting took place in the South Oil Hall between the players of the Municipality Club and South Oil Club on Tuesday, 15/10/2019, where each player made two attempts in each case scoring and these cases are scoring from rolling confrontation, scoring from handling and scoring from rolling. The two attempts were analyzed to adopt the attempt which achieved the best accuracy and high speed of the ball. The total of the two samples was calculated (60) different scoring conditions on the goal for the scoring point of the player in the upper corners of the goal only, and the camera was placed at a distance (m5.40) from the midline and at an altitude (m1.25) measured from the ground to the focus Camera lens , Variable of the maximum bend angle of the knee leg that based on at the moment of kicking the ball and the maximum bend variable of the angle of the hip joint at the moment of kicking the ball the maximum flexion of the hip joint angle of at the moment of the ball kicked, the angular velocity of the kicked leg, the angle of inclination of the moment the ball was kicked, the starting speed of the ball, and the angle of the kicked knee the moment the ball was kicked.

The following statistical methods were used: 1 - Arithmetic mean, 2 - Standard deviation, 3 - Analysis of variance F, 4 - Least difference L.S.D, 5 - Percentage.

2. Display and discuss the results:

Table (1)

Shows the circles and deviations of each variable

In order to test the hypothesis of the significance of differences, the analysis of variance analysis (F) was used. Table (1)

Seq	Variables	Scoring from the front-end roll		Scoring from handling		Scoring from the side roll	
		from	P	From	P	from	P
1	Maximum bend to the corner of the knee of anchor leg at the moment of kicking the ball.	136.46	1.35	133.71	1.79	121.66	3.11
2	Maximum bend to the corner of the hip joint at the moment the ball is kicked	146.60	2.17	151.93	4.28	147.45	1.47
3	The angular speed of the kicking leg	461.85	39.00	479.93	36.02	440.86	20.67
4	Angle of the body's inclination at the moment the ball is kicked	114.36	3.65	112.18	3.29	108.43	3.78
5	The speed at which the ball is launched	19.55	0.65	20.60	0.90	19.85	0.20
6	The corner of the knee of kicked leg at the moment of kicking the ball.	147.68	1.58	151.46	2.85	151.90	2.36

shows the results of differences in each variable between different scoring cases. It was found that the value of (F) of the study variables achieved differences between scoring cases studied except in the speed variable of Corner of the kicked leg.

Table(2)

Contrast analysis shows

Variables		Total squares	Degree of freedom	Average squares	F	Sig
Maximum bend to the corner of the knee of anchor leg at the moment of kicking the ball.	Between groups	743.61	2	371.80	75.55	0.00
	Within groups	73.81	15	4.92		
	Total	817.42	17			
Maximum bend to the corner of the hip joint at the moment the ball is kicked	Between groups	98.53	2	49.26	5.86	0.013
	Within groups	126.08	15	8.40		
	Total	224.62	17			
The angular speed of the kicking leg	Between groups	4587.02	2	2293.51	2.11	0.155
	Within groups	16235.72	15	1082.38		
	Total	20822.74	17			
Angle of the body's inclination at the moment the ball is kicked	Between groups	108.06	2	54.03	4.20	0.035
	Within groups	192.75	15	12.85		
	Total	300.82	17			
The speed at which the ball is launched	Between groups	3.51	2	1.75	4.05	0.039
	Within groups	6.49	15	0.43		
	Total	10.00	17			
The corner of the knee of kicked leg at the moment of kicking the ball.	Between groups	64.56	2	32.28	5.96	0.012
	Within groups	81.22	15	5.41		
	Total	145.78	17			

In order to ascertain the significance of the differences, the researcher used the L.S.D test and its results are shown in Table (3).

Table (3)

shows a less moral difference

T	Variables	Groups	Difference	Sig
1	Maximum bend to the corner of the knee of anchor leg at the moment of kicking the ball.	136.46 - 133.46 136.46 - 121.66 133.46 - 121.66	2.75 * 14.80 * 11.8 *	0.049 0.00 0.049
2	Maximum bend to the corner of the hip joint at the moment the ball is kicked	146.60 - 151.93 146.60 - 147.45 151.93 - 147.45	5.33- * 0.85 - 5.33 *	0.006 0.619 0.006
3	The angular speed of the kicking leg	461.85 - 479.93 461.85 - 440.86 479.93 - 440.86	18.08 - 20.98 39.06	0.356 0.287 0.098
4	Angle of the body's inclination at the moment the ball is kicked	114.36 - 112.18 114.36- 108.43 112.18 - 108.43	2.18 5.93 * 3.75	0.308 0.012 0.090
5	The speed at which the ball is launched	19.55 - 20.60 19.55 - 19.85 20.60 - 19.85	1.05 - * 0.3 - 1.05 *	0.014 0.442 0.014
6	The corner of the knee of kicked leg at the moment of kicking the ball.	147.68 - 151.46 147.68 - 151.90 151.46 - 151.90	3.78 - * 4.22 - * 0.44 -	0.013 0.007 0.751

The results showed that there is a significant difference in the maximum bend variable of the angle of the knee of the fulcrum leg at the moment of kicking the ball between the different scoring cases. The researchers believe that the player in the case of scoring from rolling confrontation that he is trying to reduce the flexion during kicking the ball before moving the ball therefore reduce the flexion led to less the time This leads to an increase in the speed of performance during scoring because the bending means the need to prolong the scoring time, which leads to the ball away from the player in excessive, causing a failure in the scoring correctly , While the angle of scoring from the handling position decreases, where the player is approaching without a ball and timing appropriately with the speed of handling and taking enough time, which results in an increase in the bending, while increasing the bending in the third case so as to different scoring and increase the difficulty more due to the player's need to change Direction of movement and make the body face

of the goal and this difficult requirement entails stopping the movement and increase the amount of force to stop the body and change direction.

It is clear that the differences in the values of the angle of the hip were between the state of scoring from front rolling and scoring from handling as well as between scoring from handling and scoring from side rolling The researcher explains this is that the reason for these differences is because the player in the scoring of handling moves without a ball and meet them in front of him and this position requires him a suitable field of view so we find that the angle of the hip was greater, while in both cases of the rolling process requires that the vision be directed On the ball which means that the hip angle is lower than in scoring from handling.

It was found that there are differences in the values of the angle of inclination between the scoring of the facing rolling and lateral rolling, Where the researcher believes that the reason is that the scoring from the lateral rolling imposes a lower inclination angle requirement because of a greater bending in the angle of the knee and this means a decrease in the center of gravity, which affects the angle of inclination. It is noticeable that the scoring in this case is that the kick leg is moving sideways in order to maintain speed because of this, Whenever the angle of inclination values are close to 90^0 The angle of inclination decreases This is evident in these values of scoring from the lateral rolling due to the difference in the scoring situation and the difficulty of this situation, It is noteworthy that the increase in peripheral speed is done through the angular speed X R (1:2000), as well as the curvature of the trunk back requires the kick leg to get the best possible tide and reduce flexion in order to increase the length of the radius of the kick leg, that is, the length of the accelerating leg of the ball kick. Commensurate with performance requirements.

It was found that the values of the speed of the ball was in favor of scoring from handling, through the difference in the speed of the ball from scoring from facing rolling as well as from rolling side, This is because the movement without a ball means to increase the speed of movement and approach and then take advantage of the principle of vectors by increasing the speed of approaching, and then transfer that speed to the ball in particular, In the case of scoring from side rolling, the approach speed decreases in all cases as a result of movement with the ball and try to keep it from moving away, which means reducing the speed of approach and that the presence of bending in the knee joint sometimes affect the angle of departure of the ball, which affects the speed outcome. Samir Musallat points out that “The outcome is affected by the amount of angle between the two forces. whenever the angle is small, the outcome is big, If the angle between the two forces continues to grow to zero, here the outcome is in the maximum value” (3:1999).

As shown from the same table that the values of the angle of the knee joint of the kick leg was in the case of scoring from handling is greater than in the case of rolling scoring confrontation and scoring in the case of lateral rolling, The researcher believes that the reason for this is due to the different scoring situation of handling, as the movement and field of the leg is greater because of the distance of the ball and take the appropriate point of kicking while it is more difficult in the case of rolling confrontation because the ball moves forward, which requires the performance of kicking movement quickly and does not take enough tide While in the case of scoring from handling, which moves the ball in the horizontal direction and the player seeks to cut off its path as well as in the case of scoring from the rolling confrontation, which works on the weighted leg kick from the back forward taking a side track and there is a better space to extend the leg more than from scoring side rolling. It is noticeable that the speed of the ball in these two types was better than scoring than side rolling due to the presence of the appropriate tide in the knee of the kick leg and the application of the principle of peripheral speed of the ball, It is worth mentioning that one of the measurements of the success of football scoring is the maximum extension of the knee joint of the leg that appears perfectly while touching the ball, and this is indicated by Risan Khraibet and Mahdi's success by saying that “whenever the length of radius of the moving object in circle way increase, the peripheral speed.as there is a direct relationship between the peripheral speed and the radius” (2:1992).

From the above shows that the control of the variables studied was dominated by the situation and according to the difference of scoring situation, while the variable speed angular does not make a significant difference, it maintains the values of this variable and this means that the situation before the scoring mode imposes situations on the player to control according to what the situation requires and the situation from which he wants to score

Conclusions

1 - It was found that the players are working to increase the flexion of the knee joint of the pivot at the moment of kicking the ball in the case of scoring from the lateral rolling more than in the cases of scoring from the rolling confrontation and scoring from handling.

2 - It turns out that the players are working to increase the angle of the hip joint at the moment of kicking the ball in the case of scoring from handling more than it is in the cases of scoring from the rolling confrontation and scoring from the rolling side.

3 - It turns out that players are working to reduce the angle of inclination of the body at the moment of kicking the ball in the case of scoring from the side rolling more than in the cases of scoring from the rolling confrontation and scoring from handling.

4 - It was found that the speed of the ball in the case of scoring from handling is greater than in the cases of scoring from the rolling confrontation and scoring from the rolling side.

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