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Designing and rationing a test of measuring the accuracy of the aiming skill by jumping from the corner and some biomechanical variables after performing the physical effort with a handball

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Abstract

The study aims to design a test and standardization to measure the accuracy of the correction skill performance from the corner area of the handball game to identify an indicator of the values of some biomechanical variables of the correction skill for the player. The descriptive method was used in the survey method to solve the research problem. The research sample included some players of the specialized school by hand for the sports season 2019-2020 and the number (54) players. A test is designed to measure the accuracy of the corner correction to be used as a test to assess the performance of players and to obtain accurate results in mechanical analysis. Because we take the successful attempt to extract the biomechanical variables, and the main experiment was conducted to search on the research sample using a video camera and use the (Kinovea-v18) program for skills analysis and data processing using the statistical program SPSS Ver 21.

The new test technology has proven its ability to locate defects and invest them in improving performance for scoring from the corner area. The test method reached a set of conclusions, the most important of which are:

1. *Design and codification of a test to measure the accuracy of the angling skill by jumping from a corner and some biomechanical variables after performing the physical effort with a handball.*
2. *The highest level achieved by the research sample was at the intermediate level and the lowest level was on average.*

***Keywords**: Biomechanics, kinematic analysis, physical effort, testing, shooting skill, corner player and handball.*

Introduction

It was noticed through studying studies and research that scientists and specialists in the field of tests and measurement have devised many and varied tools that are consistent with and commensurate with all these variables that relate to man and this does not mean that they have reached the ultimate accuracy and does not mean that there are no errors so whatever we get accurate numbers in the tests and measurement, the result It will differ if we use a more accurate tool due to the development of the devices and tools used in the tests and measurements in addition to the instability of the individual level and the variable quickly because of his preparations and motives as well as the errors of observation and experimentation based on self-evaluation, tests and measurements have become one of the most important elements of development, thanks to them Today the world is more able to face the problems and requirements of life and more works to give values and evaluation of performance in all games, whether individual or teams, and scientific tests that the sports field witnessed play a prominent role in diagnosis, classification and evaluation, and the development of degrees, standards and levels, that it must be done this way quickly, and dates

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High-precision shooting (achievable and performance). A good score is mandatory, consistent, and effective skills characterized by strength, speed, and accuracy in shooting the ball towards the goal without violating the rules of play,[1] as well as it helps guide players to identify weaknesses and strengths of the skills and physical characteristics required to be evaluated by players, The player can aim quickly and not to prolong the time in order not to allow the goalkeeper to take the time to know the movement of the attacking player and not to reveal the area that he will aim at,[2] and the correction skill is one of the basic skills in handball, which depends on the result of the match through the superiority of the team most hitting a goal the other team that the correction is not the result of the attack in the hope of scoring a goal where a suitable situation is created in which one of the team members can implement a goal throw directly with a good opportunity to score .[3]

Therefore, many experts, researchers and trainers resort to searching for objective tests that accurately measure whether they are physical or skill tests for different sporting activities, and handball is one of the group games interesting for practitioners and viewers together, and this fun that the game brings to everyone is obligated for those interested in them to keep up with everything that is New in order to benefit from it in this game to match the development it got from popularity by increasing the number of viewers and practitioners in the Olympic and international tournaments in addition to the local matches and championships of each local federation in all countries of the world, so the researchers prepared a test that is in line with the atmosphere of the game where The gaps are narrowed to the attacking players and prevent them from shooting, especially from close distances so the attacking player is required to stay away from the defending player to prevent a legal line from entering the opponent in addition to reducing the distance between the attacking player and the goalkeeper.

The player needs to Having a high level of accuracy in the implementation of the proximity of the attacking player to the goal as he tries to reduce the distance B The area from which the player is shooting and the goal, which is one of the main and important factors in handball, the closer the distance is, the more likely the success of the correction ,[4] it is evident that any feature, phenomenon or condition is not explained or determined level or percentage or analysis unless It is tested or measured, because handball needs a high level of skill performance in addition to high physical exertion because the game is characterized by fast paced during the game, that due to the different areas of correction including What is medium or far, so it depends on the player's ability first and the extent of his mastery of remote or near shooting in addition to the proximity or after the shooting player to the competing player,[4] as the research problem lies in the negligence of coaches and workers in the training field in how to measure the level of accuracy of skill performance in general and player The corner, in particular, is that this player is considered one of the important players in the current time, because they enjoy an important and effective position, especially in resolving points in the game and giving accurate information about the training situation, and the reason is the humiliation. K to the lack of tests that are based on scientific foundations to assess their skill level, so the researchers decided to design tests that are in line with this development, and therefore it was found that this problem is worthy of study, research and investigation for the richness of the library and the enrichment of trainers with an important reference in tests and measurement.

Research objectives

1. Design and codification of a test to measure the accuracy of the shooting skill by jumping from the corner after performing the physical effort of the handball.
2. Finding standard levels and scores to test the accuracy of the shooting skill by jumping from the corner after performing the physical effort with the handball.
3. Identify some of the biomechanical variables of the research sample.

Research hypotheses

1. Building and legalizing a test to measure the accuracy of the shooting skill by jumping from a corner after performing the physical effort with a handball.
2. Identify the standard grades and levels to test the accuracy of the shooting skill by jumping from the corner after performing the physical effort with a handball.

Research Methodology

Since the selection of the appropriate approach to research any problem depends on the nature of the problem itself, so the two researchers took the descriptive approach as a way to reach the goals and hypothesis of the research.

The research sample

The research sample included some players of the specialized school by handball for the sports season 2019-2020, and they numbered (54) players for each of them because they were of a good level, and their percentage (80.59%) of the original community and the number (67) players, and to make sure From the homogeneity of the sample in the variables that may affect the course of the experiment, the two researchers statistically treated using skewness and showed all the value by which the torsion was between (3 ±) (Wadih Yassin Muhammad and Hassan Muhammad Abed, 1999) (), which indicates the homogeneity of the members of the research sample in the variables Anthropometry, (mean and standard deviation) (length 1.78 ± 0.20 meters), (age 16.165 ± 0.752 years), (mass 70.166 ± 3.544 kg).

Means, tools and devices used

- Arab and foreign sources and references
- Handball and legal balls.
- Rubber cords
- Metal tape measure.
- Medical scale.

Field research procedures

The researchers deliberately designed and codified tests to achieve the goals of the research, after looking at some available sources and references on the design and codification of the tests.

Steps to design the tests

The researchers prepared the preliminary version of the tests and presented them to the experts and specialists * After reviewing the literature on tests and measurement in the game of handball in physical education, the researcher was able to formulate a new idea for a test to measure the accuracy of the performance of shooting skill by jumping from the corner, that skill performance is one of the important things in handball, as it is characterized by a fast nature and needs to be in the performance and that most of its skills are characterized by working according to the airpower system so players must have a level that enables them to perform during the game,[5] so he designed skill test was presented to a group of experts and specialists in the field of tests, measurement and handball.

Final test[6]

- The purpose of the test: to measure the accuracy of the shooting skill from a corner
- Tools: 10 handballs, a handball field, a handball goal, rubber ropes as shown in the figure below, adhesive tape, tape measure, registration form, recorder.

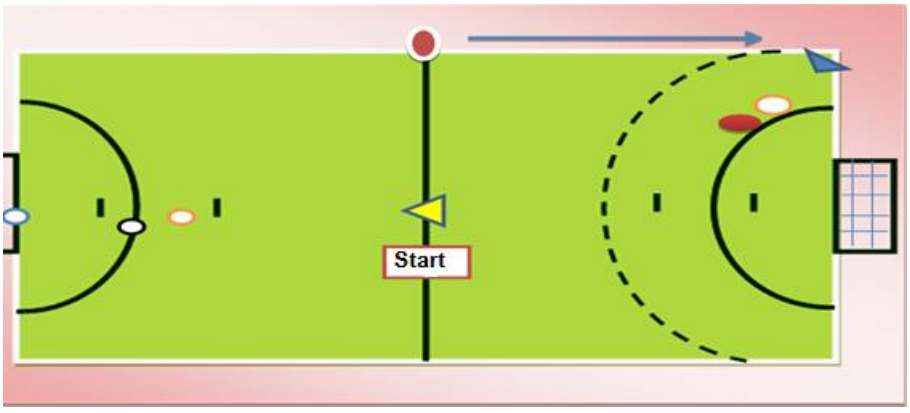

Figure 1. Shows the way the test is performed

- Procedures: Determine the area from which the player begins the movement and that is in the middle of the field, the way the player moves and the region where he ends, where the goal was divided into a rectangle of

different sizes, respectively (50, 55, 55, 65, 70) cm, starting from the right side only. The degree of difficulty concerning horizontal division (goal width). As for vertical division, the height of the goal is divided into three rectangles with different sizes, respectively (60, 75, 65) cm. As for the dividers between the rectangles, it is made of ropes made of rubber material with a thick (1 cm) thickness. The figure, as shown in the figure below.

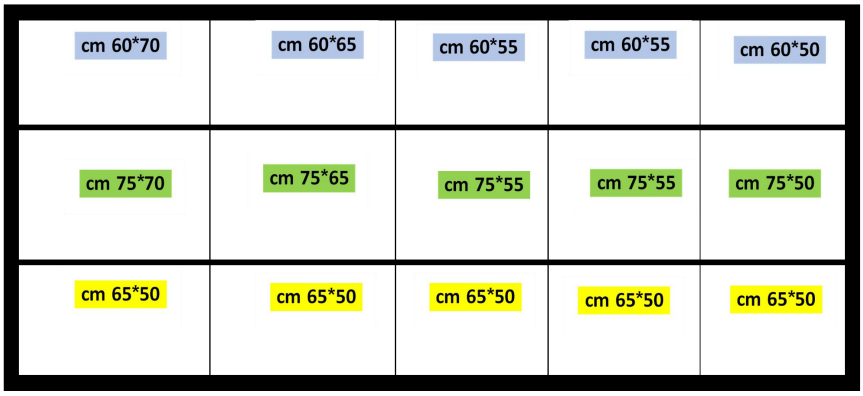

Figure 2. Shows the handball goal divisions

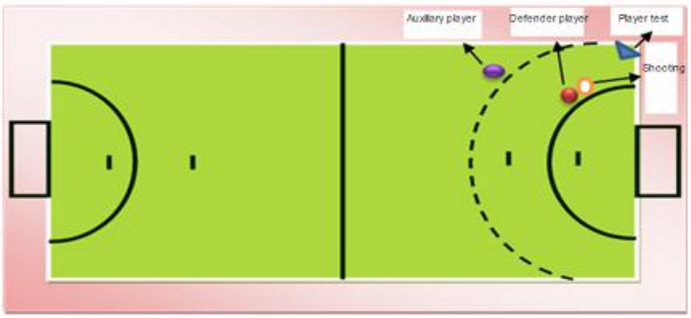

Figure 3. Shows the parking areas of the laboratory, guns, and assistant players

- Registration: The laboratory gives grades from the right and consecutive (5, 4, 3, 2, 1) for the higher rectangles.

1. The laboratory gives grades from the right and respectively (3, 3, 1, 1, 1) for the lower rectangles.
2. The laboratory gives grades from the right and consecutive (4, 3, 2, 1, 1) for the middle rectangles.
3. The player is awarded zero if the ball is struck by a column or crossbar or exits outside the boundaries of the goal.
4. The player is awarded a zero if the ball is struck by a column or crossbar or is outside the boundaries of the goal.
5. If the ball is touched by any of the rubber cords, it is given half of the pitch for both regions.
6. The value of the test ranges between (0-25) degrees.

Pilot study

The researchers conducted a reconnaissance experiment on some (3) players in the Basra Municipality Club to ascertain the research problem (research experiment) and its purpose was to identify the appropriateness of measurements and identify some test requirements before proceeding with legalization.

Scientific coefficients for testing

The researchers codified the test and applied the scientific foundations of my agency

The validity of the test

To achieve the purpose of the test, the researchers distributed the test form to a group of experts and specialists in the field of handball, tests and measurement to ensure the validity of the test for its suitability with the research sample. It was found that the test measures what was designed for it, the researchers used the validity of the (virtual) arbitrators and their ratio (100%) after making some adjustments, the researchers also performed the test on a sample of (5) players from the Basra Municipality Club, to find the stability of the test.[7]

Reliability test

The return method, whereby the two researchers re-tested a week after the first test on the same sample that the test was conducted, and they numbered (5) players. After that, the researchers used the simple correlation law Pearson (r) for the two tests, which showed a statistically significant relationship between the two tests using the retest method as shown in the table (1).

Table 1. Shows the degree Stability to measure the accuracy of the performance of the shooting skill from the corner

Test	The first test		The second test		The calculated value of (r)	Sig.
	Mean	SD	Mean	SD		
Measuring the accuracy of angling skill performance	15.600	1.037	13.300	1.140	0.893	0.042

Objectivity

The objectivity was conducted by two arbitrators and after recording the results they were statistically processed using the Spearman Law as shown in table (2).

Table 2. Shows the degree of objectivity of the test to measure the accuracy of performance of the correction skill from the corner

Test	First referee		Second referee		The calculated value of (r)	Sig.
	Mean	SD	Mean	SD		
Measuring the accuracy of angling skill performance	14.00	2..017	13.00	2.009	0.975	0.005

The main experience

The researchers conducted the main experiment for ten days, on 06/15/10/2019.

Mechanical variables

1. Approaching velocity: It is the sum of the horizontal distance divided by the player during the last two steps by their time, measured in meters/second .[8]
2. The speed of the ball: It is measured by calculating the distance between the centre of the sphere at a certain point and another point after (5) images divided by the time of the sphere's centre transition between two points, and measured in meters / sec.[9]
3. The amount of movement (momentum): the product of the mass of the object multiplied by its velocity .[10]

Statistical means

The researchers used the SPSS statistical program version (22).

Results

Table 3. Shows the statistical description

Statistical description	less value	highest value	Mean	SD	Variance	Skewness	Flatness
Test	12.00	19.00	15.8333	1.87	3.168	-0.139	-0.850

Through table (3) we find that the lowest value achieved by the sample (19.00) and the lowest value (12.00) and the value of the mean (15.8333) and with a standard deviation of (torsional coefficient values are less than (± 1) which makes the test reliable in the results general It is suitable for the level of the sample and is close to the normal distribution which lies between the two limits (± 1) and it is called the torsion spring scale .[11]

Standardized test scores

After the two researchers obtained the raw grades that are considered degrees without significance, as it is a preliminary result of the tests, it is difficult to compare these grades with a set of vocabulary tests. Therefore, the researcher converted the raw grades into standard grades, by using the modified standard grades using the sequence method. As the raw scores are the primary result of the test, and this requires the conversion of raw scores into standard scores, which is "a way to determine the relative state of the raw scores, and therefore these grades can be interpreted and their results evaluated".[12]

As the score (100) represents the maximum evaluation of the distribution of the standard scores and the degree (50) represents the average evaluation score and the degree (zero) represents the lower limit of the calendar where the arithmetic mean of the tests is placed in front of the degree (50) then the fixed amount is combined with the mean in the grades table Standard and put the result in ascending order until we reach the degree (100) and the fixed amount is subtracted with the mean in the standard scores table and we put the result in ascending order until we reach the degree (100) and the fixed amount is subtracted from the arithmetic mean in the same table and we put the result descending in front of the standard scores field until we get to the degree (1).

Table 4. Shows the raw and standard scores for the research sample

Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades	Raw grades	Standard grades
24.555	100	20.105	75	15.655	50	11.205	25
24.377	99	19.927	74	15.477	49	11.027	24
24.199	98	19.749	73	15.299	48	10.849	23
24.021	97	19.571	72	15.121	47	10.671	22
23.843	96	19.393	71	14.943	46	13.493	21
23.665	95	19.215	70	14.765	45	10.315	20
23.487	94	19.037	69	14.587	44	10.137	19
23.309	93	18.859	68	14.409	43	9.959	18
23.131	92	18.681	67	14.203	42	9.781	17
22.953	91	18.503	66	14.053	41	9.603	16
22.775	90	18.325	65	13.875	40	9.425	15
22.597	89	18.147	64	13.697	39	9.247	14
22.419	88	17.969	63	13.519	38	9.069	13
22.241	87	17.791	62	13.341	37	8.891	12
22.063	86	17.613	61	13.163	36	8.713	11
21.885	85	17.435	60	12.985	35	8.535	10
21.707	84	17.257	59	12.807	34	8.357	9
21.529	83	17.079	58	12.629	33	8.179	8
21.351	82	16.901	57	12.451	32	8.001	7
21.173	81	16.723	56	12.273	31	7.823	6
20.995	80	16.545	55	12.095	30	7.645	5
20.817	79	16.367	54	11.917	29	7.467	4
20.639	78	16.189	53	11.739	28	7.289	3
20.461	77	16.011	52	11.561	27	7.111	2
20.283	76	15.833	51	11.383	26	6.933	1

Table 5. Shows the standard levels, raw and standard scores, and the number of players within the natural distribution curve of the research sample

Standard levels and ratios in the normal distribution curve	Standard grades	Raw grades	Number of Players	Percentage
Very good (4.86)	100-81	21.173 and above	/	/
Good (24.52)	80-61	17.613-20.995	15	27.78
Intermediate (40.96)	60-41	14.053-12.985	22	40.74

Acceptable (24.52)	40-21	10.493-13.875	17	31.48
Weak (4.86)	20-1	10.315 and below	/	/

Through table (4), the levels achieved by the sample in a test that was at the (average) level are clear to us, as the number of players (22) was the lowest and the number was at a good level and the players were (15), while the sample did not achieve any percentage mentioned in the level is very good The researcher attributes the reason for this to the internal understanding of the information in the motor performance, as we note that most players depend in their performance on the information learned during the training units because of their effective role in teaching basic skills in addition to the experience he possesses during the performance during the exercise and the frequency of repetition of it in addition to Until this stage is where playing and applying skills in a practical manner, which makes the player more performer and caring for accuracy during the correction, in addition to that it is one of the basic skills and has a fun and encouraging character to perform because the competition style exists between the players, which makes taking care of the implementation of this skill, as well The researcher attributes this to the individual differences between the research sample, where we note that there are players who are characterized by high specifications and these features are due to the large number of training and the ability to withstand the difficulties they face during training, citing (Owen) that "re-practicing the skill as many times as possible while taking into account rest periods and preferably positive provides an adequate opportunity for the player - the game to master the skill and perform better because the exercise is a lot on Compound skills and return them correctly helps to perform them properly during play ,[13] in addition to that the skill needs a high accuracy in performance since the player moves in a small area may be two or three steps in addition to that the corner of shooting at the goal is small so it needs to The arm is weighted back in order to take the appropriate position for shooting, pulling the ball by hand in the shortest way to the level of the shoulder arm of the bent arm. The wrist and fingers in directing the ball .[14]

Table 6. Shows the biomechanical variables of the research sample

S	Biomechanical variables	Units	Mean	SD
1	Approach speed	Meter / Sec.	2.431	0.088
2	Ball speed	Meter / Sec.	17.315	0.577
3	Amount of motion (momentum)	Kg*Meter / Sec.	153.09	5.732

It is noted from the above table that the approaching speed variable is small, because the distance the player moves is small, because the defending player is trying to block the player who has the ball in addition to reducing the distance that the shooting player moves, so the approaching speed is somewhat low and this is what the speed law indicated that the distance traveled through A time period, the less time, the more the player's speed increases with the stability of the distance, and the ball speed variable depends on the strength of the arm in addition to the player's ability to transfer and move movement from the arm to the tool, the faster the arm's movement is extended and backward to prepare for the correction, the arm's movement High and thus the speed of the ball is large so we note that the research sample did not achieve the required speed of the ball because the players are young in addition to not pulling the arm back, that the speed of the ball comes as a result of movement of movement from The lower extremities to the upper extremities across the trunk,[15] which is the largest part of the body and then the arm and thus the tool, in addition to that the player's flight period after leaving the Land to the moment of landing is few, so it must be corrected before touching the ground to avoid error, therefore it is necessary to increase the range or speed of movement by producing a force and transfer it from the foot of the pivot, then the stem, then the shooting arm and then the tool, which expresses a group of rapid transfers by the player For the ball in order to obtain a high speed, and the variable of the amount of movement (momentum), which depends mainly on the speed of the player being one of the two ends of the law, the greater the speed, the greater the momentum is large, so we note that the player's speed is small because he is moving in a small area that does not exceed three steps and thus is Its time is very little, and if the quotient of the distance is divided by time, the result will be very small, so we notice that the momentum of the research sample is small, where the mass of the player is fixed.[16]

Conclusions

1. Design and standardization of a test to measure the accuracy of the angling skill by jumping from a corner and some biomechanical variables after performing the physical effort with a handball.
2. The highest level achieved by the research sample was at the intermediate level and the lowest level was on average.
3. The level of the research sample appears to be physically weak and this is what the variable speed indicated.

4. The acceptable, medium and good sample performance level were limited.

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