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Finding predictive equations in terms of the speed of the motor response for some basic skills of handball youth goalkeepers

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Abstract

The study aimed to identify the efficiency of the motor response speed in predicting the performance of some basic skills of young handball goalkeepers, to identify the percentage of the contribution of motor response speed to the performance of some basic skills of young handball goalkeepers, while the research sample was represented by handball goalkeepers for young people in Iraq. Their choice was by the intentional method, and the mean, standard deviation, simple correlation coefficient, multiple regression coefficient by all regression method, and regression coefficient by gradient regression method will represent the statistical means to reach the results represented in the handball goalkeepers owning a kinetic response speed. And the extent of its contribution to the performance of some basic skills for them, as predictive equations were reached, especially through the contribution of mindfulness to the performance of some of the selected basic skills, which are as follows:

- The prediction equation in the performance of the blocking skill from the right corner of the goal area with the arms to the upper corner of goal No (2).
- The prediction equation in the performance of the blocking skill from the left corner area of the goal with the arms to the upper corner of goal No (3).
- The prediction equation in the performance of the blocking skill from the right forearm area by jumping to the side with the arms to the upper right side of goalkeeper No (4).
- The prediction equation in the performance of the blocking skill from the left forearm area by jumping to the side with the arms to the upper right side of goalkeeper No (5).

The researcher recommended that trainers should focus on paying attention to training programs that develop the speed of motor response of handball goalkeepers because they have an effective role in their skill performance.

Keywords: Prediction, kinetic response speed, basic skills, goalkeepers, handball

Introduction

It is also known that every sports game has characteristics that distinguish it from other games with the required motor and skill duties that players perform in training units or during competitions. It is an important part of these games that have a specificity in the nature of the skillful performance, which requires the senses to possess special physical and psychological characteristics and traits that qualify him to perform the special motor duty in this center.

The speed of the motor response helps individuals to realize and participate in the activities carried out moment by moment, and the experiences gained have an effective role in making the decision at the right moment. In addition, the speed of the motor response prompts individuals to enhance, develop and develop skills, improve self-confidence and increase the ability to perform skill, and the speed of the motor response contributes to Anticipate the reactions, as the goalkeeper, when he is fast, is in an increased state of ability to perform well.

Hence the importance of the research, considering the speed of the kinetic response of the goalkeeper in handball is one of the necessary and main aspects that cannot be dispensed with or neglect, which is the decisive factor in many playing situations and is an important factor in the integration of the skillful performance of goalkeepers in handball, which works On the link between skill and physical performance, so the skill performance of goalkeepers depends on the extent of his speed by acquiring physical abilities through exercises and competitions and

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its reflection on the skill performance of goalkeepers, as well as finding a digital statistical method that allows the coach to know the ability to Using the skills of the goalkeeper combined, and this is what the researcher aims at if there is a relationship between the speed of the motor response and some basic skills of handball goalkeepers, and the extent to which the speed of the motor response contributes to the skillful performance of handball goalkeepers.

Research problem

Through the researcher's review of many sources and scientific research, he found that there are no statistical parameters that allow to know the level of the goalkeeper in the speed of the motor response for some basic skills, in addition to the fact that there is no numerical statistical method that allows predicting the effectiveness of the skill performance based on the data. The speed of the statistical motor response for a group of Skills as the real way to reach the optimal skill performance, and the researcher also wanted to research whether the speed of the motor response had a contributory role in the performance of some basic skills in handball goalkeepers.

Research Objectives

1. Recognizing the relationship of motor response speed with the performance of some basic skills of young handball goalkeepers.
2. Identifying the percentage of the contribution of motor

response speed to the performance of some basic skills of young handball goalkeepers.

3. Recognizing the efficiency of the motor response speed in predicting the performance of some basic skills of young handball goalkeepers.

Research areas

1. **The human field:** Goalkeepers of the youth league handball
2. **Spatial domain:** The sports hall of Al-Karkh Sports Club.
3. **Time range:** 7/202021 to 9/01/2021

Research method

The researcher used the descriptive method for its suitability and the nature of the research.

Research community and sampled

The research community was represented by the goalkeepers of the Youth Handball League in Iraq for the sports season (2021-2020), which numbered (33) goalkeepers, and the research sample was chosen by the intentional method, and (3) goalkeepers were excluded for the purpose of conducting the exploratory experiment to verify the scientific bases of the tests used. The final number of the sample was (28) goalkeepers, representing (84.84%). For the purpose of achieving homogeneity between goalkeepers, the following variables were set, and Table (1) shows this.

Table 1: Shows the arithmetic means, standard deviations and skew coefficients for the research sample

Variables	Arithmetic mean	Standard Deviation	Skew coefficients
Chronological age (Year)	18,86	1,54	- 0.03
Length (cm)	181.784	2,87	- 0.18
Weight (kg)	73,85	1,37	0.13
Training age (Year)	4.481	0,98	0.75

Equipment and tools used in the research

(Computer, handball court, handballs, colored tape, sign, stopwatch).

Define variables

Through the researcher's experience as a researcher and academic, as well as a goalkeeper and coach for Iraqi clubs, the variables were determined by the researcher without referring to the experts.

Tests for search variables

In order to determine the tests through which the selected basic skills can be measured, the researcher extracted a number of tests from sources, references and previous studies.

1- Motor Response Test (1:140)

The objective of the test: To measure the ability to respond and move quickly and accurately, according to the exciting choice.

Tools: a space free of obstacles, 20 meters long and 2 meters wide. A tape measure stopwatch.

Procedures: Planning the testing area with three lines, the distance between each line and the last is 6.40 m, and the length of the line is 1 m.

Method of performance: The player stands at one end of the center line facing the referee who is standing at the other end of the line.

- The player takes the standby position so that the center line is between the feet and bends his body forward a little.
- The referee holds a stopwatch with one of his hands and raises it up, then moves his arm either to the left or the right or at the same time turns on the watch.
- The player responds to the hand signal and tries to run as quickly as possible in the specified direction to reach the side line, which is 6.40 meters away from the center line.
- When a player crosses the side line, the referee stops the clock.
- If the player starts running in the wrong direction, the referee continues to run the clock until the player changes direction and reaches the right side line.

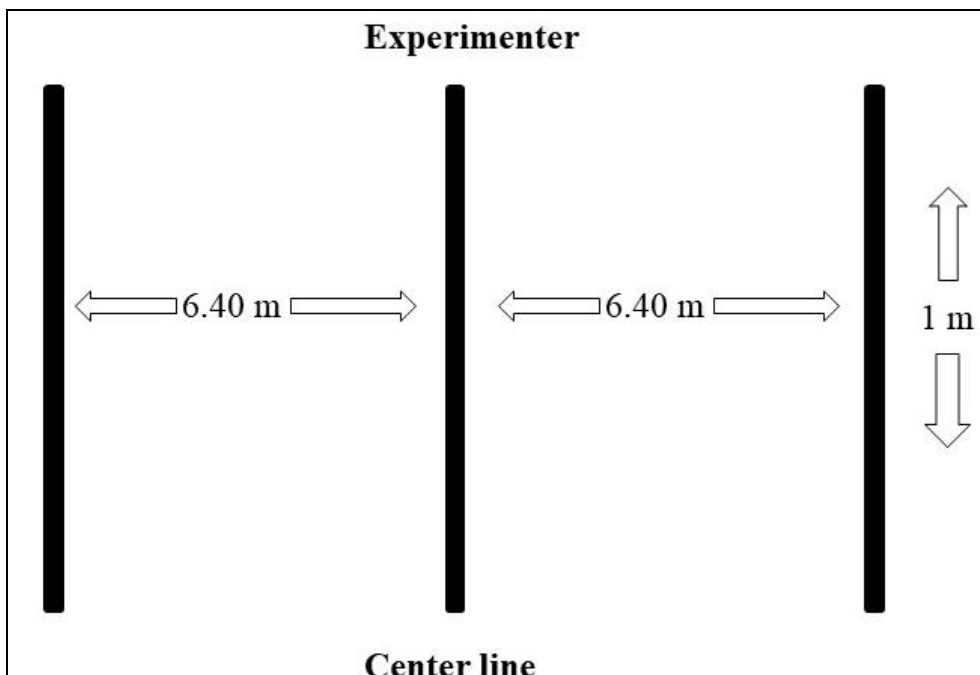


Fig 1: The center line

The player is given ten consecutive attempts, between each attempt and another 20 seconds, with five attempts on each side.

The attempts on each side are chosen randomly.

The conditions

- Each player is given a number of attempts outside the measurement in order to become familiar with the test procedures.
- The referee must practice the hand signal.
- The player must not know that he is required to perform ten attempts distributed over five attempts in each direction to reduce the player’s expectation.
- The player must be warned that the number of attempts that he will perform is not distributed equally in both directions, but rather that the number of attempts in one direction is likely to be greater than the other, and that the order of performance of the attempts is done in a random manner and it varies from one player to another.

The test must begin with the referee giving the following signal:

Table 2: Motor Response Test

Number	Order of attempts	time
1.	Left	1.4
2.	Right	1.9
3.	Left	1.8
4.	Right	1.6
5.	Left	1.7
6.	Right	1.3
7.	Left	
8.	Right	
9.	Left	
10.	Right	

$$\text{Seconds} = \frac{\text{Total Time}}{10} = \text{Total degree}$$

Prepare _ start and the interval between the words ready _ start in the

range of $1\frac{1}{2}$ to 2 seconds.

Register

The time for each attempt is calculated to the nearest $\frac{1}{10}$ of a second. The player's score is the average of the 10 attempts.

Above is a sample scorecard for the performance of the ten attempts to choose the transitional motor response distributed randomly.

2- Skill tests (3:99)

1. The name of the test: blocking from the right corner of the goal area with the arms to the upper corner of goal No. (2).

Test objective: Measure the blocking skill from the right corner of the goal area with the arms to the upper corner of the goal.

Tools: eight handballs for applicants, two figures to determine the scoring area, and two (2) cameras.

Test specifications

The goalkeeper stands at a distance of two feet from the column and takes the standby position for this area. Two players stand outside the area (6 m) on the right, at a distance of (2 m) from the outer line of the goal and in the hands of each player with a ball, and when they are given the signal to start entering and shooting at the goal from the area specified by the signs. Player after player, each player is given four balls, under the guidance of the test-taker in shooting in two places (the upper and lower corners) as in Figure (2) provided that the goalkeeper does not know the direction of the balls and confirms here that the performance of movement and jumping when scoring and the area of shooting is determined by The coach or the person conducting the test and confirms that the player does not cross the goal area line during shooting or touch it, and alerts the goalkeeper to block all areas specified in this test so that the measurement is objective and the goalkeeper does not know what the angle is measured.

Grade Calculation

Three degrees are recorded for the number of balls that the

goalkeeper can block with the arms to the upper right corner of the total of four balls that were tackled in this area only and two degrees for the balls that the player tried or prevented by shooting in the specified area but did not address them as if they were in the column or crossbar and one degree for the

balls Which was blocked and entered the goal in the form for the tests, in the event of a player's mistake by directing his ball to the specified area, another throw is added to the number of throws specified for the goalkeeper, and the total score for each skill is (12) degrees.

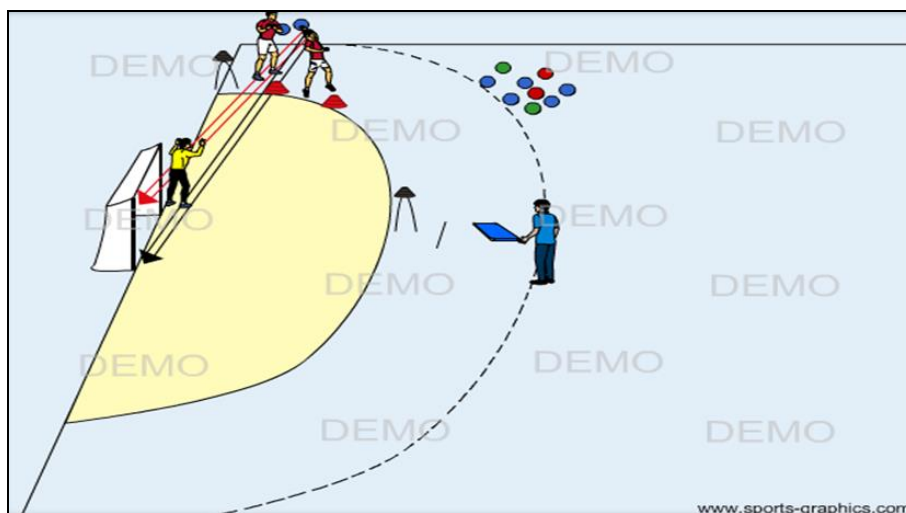


Fig 2: Measuring the blocking skill from the right corner area of the goal with the arms to the upper corner of the goal

2. Test name: blocking from the left corner area of the goal with the arms to the upper corner of goal No. (3).

Test objective: Measure the blocking skill from the left corner area of the goal with the arms to the upper corner of the goal.

Tools: eight handballs for applicants, two figures to determine the scoring area, and two (2) cameras.

Test specifications

The goalkeeper stands at a distance of two feet from the column and takes the standby position for this area. Two players stand outside the area (6 m) from the left, at a distance of (2 m) from the outer line of the goal and in the hands of each player with a ball, and when they are given the signal to start entering and shooting at the goal from the area specified by the signs. Player after player, each player is given four balls, under the guidance of the test-taker in shooting in two places (the upper and lower corners) as in Figure (3) provided that the goalkeeper does not know the direction of the balls

and confirms here that the performance of movement and jumping when scoring and the area of shooting is determined by The coach or the person conducting the test and confirms that the player does not cross the goal area line during shooting or touch it, and alerts the goalkeeper to block all areas specified in this test so that the measurement is objective and the goalkeeper does not know what the angle is measured.

Grade Calculation

Three degrees are recorded for the number of balls that the goalkeeper can block with the arms to the upper left corner of the total of four balls that were tackled in this area only and two degrees for the balls that the player tried or prevented by shooting in the specified area but did not address them as if they were in the column or crossbar and one degree for the balls Which was blocked and entered the goal in the form for the tests, in the event of a player's mistake by directing his ball to the specified area, another throw is added to the number of throws specified for the goalkeeper, and the total score for each skill is (12) degrees.

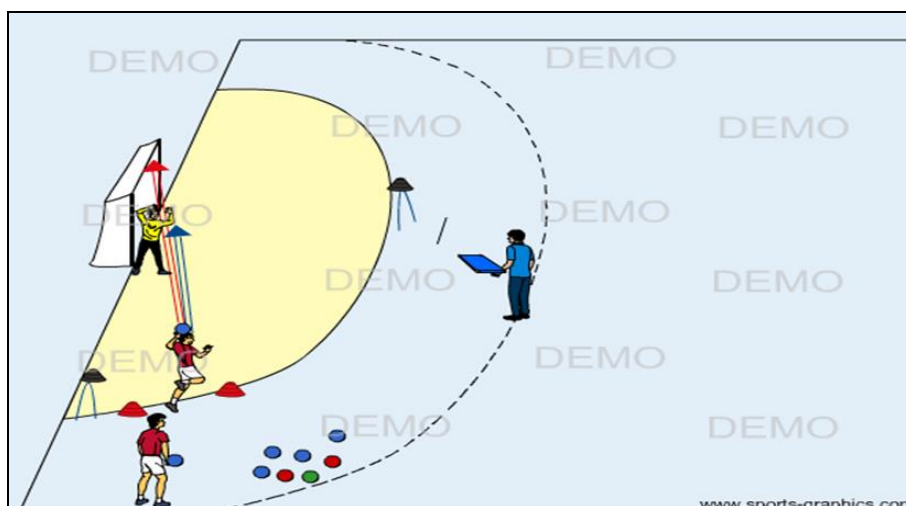


Fig 3: Measuring the blocking skill from the left corner area of the goal with the arms to the upper left corner of the goal

3. The name of the test: blocking from the right forearm area by jumping to the side with the arms to the upper right side of goalkeeper No (4).

The goal of the test: To measure the skill of blocking from the right forearm area by jumping to the side with the arms to the upper right of the goalkeeper.

Tools: Sixteen handballs for applicants, two figures to determine the shooting area, two (2) cameras.

Performance Specifications

The goalkeeper stands in the center of the goal area and takes the standby position for this area, and four players stand outside the free-throw area (9 m) and each player holds a ball. The goal after dividing the goal into four areas (the upper right and left corner and the lower right and left angle) as in Figure (4) directs the player to shoot in the place chosen by the test-taker, the players move and shoot at the goal player

after another and the shooting is from movement and jumping up, and here the test person confirms not to cross the signs or not to touch the free-throw line during shooting and also confirms that the goalkeeper must block the balls shot at him from all sides.

Calculation of the degree: Three degrees are recorded for the number of balls that the goalkeeper can block from the right forearm area with the arms to the upper right of the goalkeeper out of a total of four balls that were tackled in this area only and two degrees for the balls that the player tried or prevented by shooting in the specified area but did not address it. It was in the column or the crossbar and one score for the balls that he blocked and entered the goal in the form for the tests. In the event of a player mistakenly directing his ball to the specified area, another throw is added to the number of throws specified for the goalkeeper, and the total score for each skill is (12) degrees.

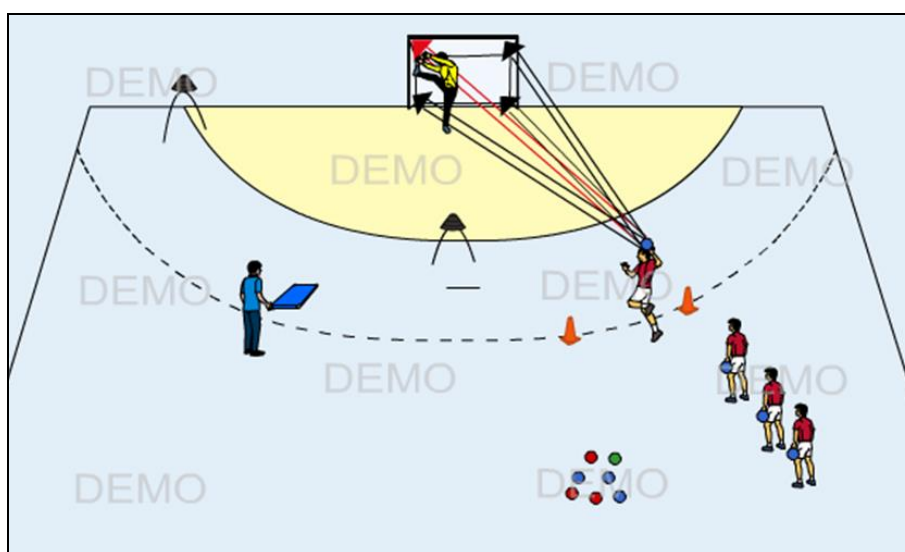


Fig 4: Measuring the blocking skill from the right forearm area by jumping to the side with the arms to the upper right of the goalkeeper

4. The name of the test: blocking from the left forearm area by jumping to the side with the arms to the upper right side of goalkeeper No (5).

Test objective: Measure the blocking skill from the left forearm area by jumping to the side with the arms to the upper right of the goalkeeper.

Tools: Sixteen handballs for applicants, two figures to determine the shooting area, two (2) cameras.

Performance specifications: The goalkeeper stands in the center of the goal area and takes the standby position for this area, and four players stand outside the free-throw area (9 m) and each player has a ball in the hand of each player. By shooting at the goal after dividing the goal into four areas (the upper right and left corner and the lower right and left corner)

as in Figure (5) the player is directed to shoot in the place chosen by the test-taker, the players move and shoot at the goal player after another and the shooting is from Movement and jumping up, and here the test person confirms not to cross the signs or not to touch the free-throw line during shooting and also confirms that the goalkeeper must block the balls shot at him from all sides.

Calculation of the degree: Three degrees are recorded for the number of balls that the goalkeeper can block with the arms to the upper right of the goalkeeper out of a total of four balls that were tackled in this area only, and two degrees for the balls that the player tried or prevented by shooting in the specified area but did not address it as if it were in the column or the crossbar and one score for the balls that he blocked and entered the goal in the form for the tests.

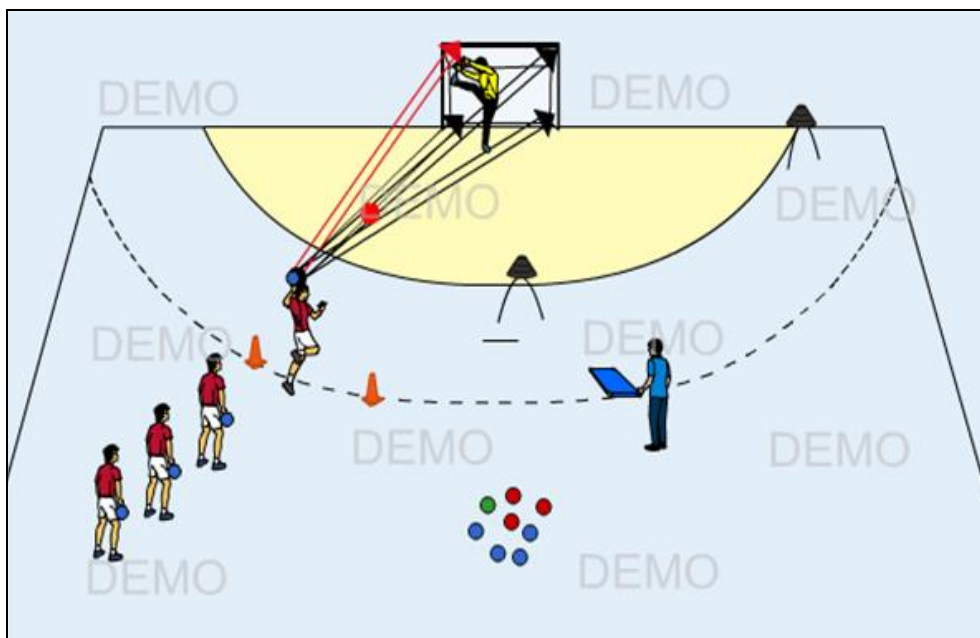


Fig 5: Measuring the blocking skill from the left forearm area by jumping to the side with the arms to the upper right of the goalkeeper

2-7 Scientific treatments of tests (Honesty, Objectivity, Stability)

Validity of the test: it means “that the test measures what it was designed to measure, meaning that the honest test is a test that measures the function that it claims to measure and does not measure anything else instead of or in addition to it (11:287). Accordingly, the researchers used content or content validity, where (Sacks) confirmed that “content validity is always used in evaluating achievement tests.” (13:221) Since this type of honesty depends on expert evaluation, the researcher presented the proposed tests to a group of experts And specialists in the field of handball, tests and measurements, and it has been proven that the tests have a degree of validity after experts agreed that they achieve the

purpose for which they were set.

Test stability: The researchers used the method of retesting to find the reliability coefficient, as the tests were applied to the participants in the pilot experiment, and the test was repeated after (5) days and under the same conditions, and the results were as in Table (2).

Objectivity of the test: The researcher used arbitrators for the purpose of giving a real evaluation of the tests and through the application of (Pearson's Law) it became clear that all the tests were of high objectivity as shown in Table (2).

Table 3: It shows the coefficients of stability and subjective validity of the tests Search skill

	Test name	Constancy	Honesty	Objectivity
1.	Motor response speed	0,84	0,91	0,90
2.	Blocking from the right corner area of the goal with the arms to the upper corner of the goal	0,85	0,89	0,92
3.	Blocking from the left corner area of the goal with the arms to the upper corner of the goal	0,82	0,93	0,89
4.	Blocking from the right forearm area by jumping to the side with the arms to the upper right of the goalkeeper	0,83	0,90	0,93
5.	Blocking from the left forearm area by jumping to the side with the arms to the upper right of the goalkeeper	0,86	0,95	0,91

2.9 main experience

The researcher, with the help of the assistant work team, applied the main experience in the assembly of the Iraqi Youth League championship in the Karkh Sports Club hall on 3/8/2021 to 8/8/2021, where all the tests were applied to goalkeepers after clarifying the conditions for applying the tests, and the purpose of them. And the method of scoring the degree, and the logical sequence was taken into account when applying the tests, and according to the effort required by the test, this was given a period of time to warm up before the tests were carried out, and a sufficient period of time was given to rest between one repetition and another and between one test and another to ensure recovery of recovery for goalkeepers.

coefficient, mode (highest value - lowest value), multiple correlation coefficient, regression coefficient of all regressions (Enter), regression coefficient of stepwise regression.

3. Presentation and discussion of the research results

3-1. Statistical description of the research variables

From the above table, it is clear that the distribution of the sample in the tests selected in the research was a normal and non-random distribution depending on the values of the skewness coefficient, which ranged between (1,-1) as well as the values of (Kolmogorov-Smirnova) and (Shapiro-Wilk) test were greater From a value of 0.05, this indicates that the sample is normally distributed.

2.10 Statistical means

Arithmetic mean, standard deviation, simple correlation

Table 4: It shows the statistical parameters and the value of the error rate (Sig.) for the (Kolmogorov-Smirnova) and (Shapiro-Wilk) test to show the normal distribution of the research variables.

Variable sequence	Highest value	Less value	The sample		Skewness	Tests of Normality		Distribution signification
			s	+p		Sig. Kolmogorov-Smirnova	Sig. Shapiro-Wilk	
1	4.33	1,23	3,46	0.76	0.02-	0.200	0.489	Natural
2	4	8	7,86	1,76	0.03-	0.200	0.231	Natural
3	3	9	7,45	1,54	0,12	0.200	0.039	Natural
4	5	8	8,23	2,02	0,23	0.200	0.200	Natural
5	3	10	9,43	0,89	1	0.200	0.220	Natural

3.3. Matrix of inter-correlations between motor response speed and some basic skills of young handball goalkeepers.

From the table (7), which represents the proportions of the contribution of the speed of the motor response in some basic skills of handball goalkeepers using the method of all regressions Enter, we note that:

- The value of the multiple correlation coefficient between the speed of the motor response and the skill of blocking from the area of the right corner of the goal with the arms to the upper corner of goal No. (2), amounted to (0.832), while the contribution ratios reached (0.693), which is a significant value because the probability value (Sig) The value of (0.000) is less than the value of ≥ 0.05 .
- And the value of the multiple correlation coefficient between the speed of the motor response and the skill of blocking from the left corner area of the goal with the arms to the upper corner of goal No. (3), was (0.792), while the percentages of contributions amounted to (0.628), which is a significant value because the probability value (Sig) The value of (0.001) is less than the value of ≥ 0.05 .
- And the value of the multiple correlation coefficient between the speed of the motor response and the skill of blocking from the right forearm area by jumping to the side with the arms to the upper right of goalkeeper No. (4), was (0.833), while the percentages of contributions

reached (0.694), which is a significant value because the probability value (Sig) of (0.000) is less than the value of ≥ 0.05 .

- And the value of the multiple correlation coefficient between the speed of the motor response and the skill of blocking from the left forearm area by jumping to the side with the arms to the upper right of goalkeeper No. (5), was (0.820), while the percentages of contributions reached (0.682), which is a significant value because the probability value (Sig) of (0.001) is less than the value of ≥ 0.05 .
- Thus, we get four equations to predict some of the basic skills of goalkeepers in terms of the speed of the motor response, as shown in Table (7).

Table 5: The matrix of inter-correlations of the search variables

Variable sequence	1	2	3	4	5
1		0.832	0.792	0.833	0.820
2	0.832		0.842	0.813	0.790
3	0.792	0.842		0.890	0.862
4	0.833	0.813	0.890		0.901
5	0.820	0.790	0.862	0.901	

*Significant at the error level ≥ 0.05 **Significant at error level ≥ 0.001

Table 6: Contribution percentages, motor response speed and some basic skills of young handball goalkeepers

Variables	Constant	Laboratories	Degree of freedom	q	Variables	Constant	Laboratories
Responsiveness	2 -1.901	0.453	26-2	23.508	0.000	0.832	0.693
	3 -3.649	0.880		19,935	0.001	0.792	0.628
	4 -4.202	0.547		22,656	0.000	0.833	0.694
	5 -3,501	0,623		23,876	0.001	0,820	0,682

Table 7: prediction equations resulting from the contribution of motor response speed and some basic skills of young handball goalkeepers

The equation	Equation	Contribution ratios
Own	Skill No. (2) = -1.701 + (0.223) x Response speed	0.693
Own	Skill No. (3) = -3.369 + (0.080) x Response speed	0.628
Own	Skill No. (4) = -5.562 + (0.147) x Response Speed	0.694
Own	Skill No. (5) -5.562 + (0.147) x Response Speed	0,682

3-5 Discussion results

The results of the statistical analysis in the above tables showed that there is a significant correlation between the speed of the motor response and some basic skills of the handball goalkeepers selected in the research. Another is in the extent of the skilled and ideal performance throughout the match period in the Iraqi Youth League, especially the sensitive and enthusiastic matches. The establishment of the tournament, and this was confirmed by Ahmed Oreibi, "that a player who possesses a sufficient amount of mental abilities and motor abilities can change from a normal or acceptable

level to a higher level that helps him in his high physical effort in matches, which affects his focus, especially in decisive matches." (1: 2000).

Many studies confirm that the speed of the motor response varies in relation to the skill level of goalkeepers, so the good response speed will try to affect and develop the player's motor achievement, so the advanced player with good experience will have good performance, responses and results. (6) 160-161)

"The enjoyment of mental aspects of the individual leads to him being psychologically, personally and socially

compatible with himself and others and be able to achieve himself and invest his abilities and capabilities to the maximum extent possible.” (8:9).

Therefore, coaches must emphasize in their training programs the kinetic response of goalkeepers, as it has a role in the goalkeeper's performance, which improves skills specific to the game he plays in addition to all the skills of the goalkeeper.

This is what the researcher found, as the percentage of the contribution of the speed of the motor response in skill No. (2) was (0.693), while the percentage of the contribution of the speed of the motor response in skill No. (3) was (0.628), while the percentages of the contribution of the speed of the motor response in the skill number (4) (0.694), while the percentages of the contribution of the speed of the motor response in skill No. (5) amounted to (0.682), and these results are close to what was mentioned in the above source.

4.1 Conclusions

The results of the statistical analysis showed the following:

- Youth handball goalkeepers in Iraq have a kinetic response speed.
- The speed of the motor response has a significant correlation in the performance of some basic skills of young handball goalkeepers in Iraq.
- The speed of the motor response greatly contributes to the performance of some basic skills of young handball goalkeepers in Iraq.
- Predictive equations were reached, especially through the contribution of the kinetic response speed to the performance of some basic skills of young handball goalkeepers in Iraq, which are as follows:
 - The prediction equation in the performance of the blocking skill from the right corner of the goal area with the arms to the upper corner of goal No (2).
 - The prediction equation in the performance of the blocking skill from the left corner area of the goal with the arms to the upper corner of goal No (3).
 - The prediction equation in the performance of the blocking skill from the right forearm area by jumping to the side with the arms to the upper right side of goalkeeper No (4)
 - The prediction equation in the performance of the blocking skill from the left forearm area by jumping to the side with the arms to the upper right side of goalkeeper No (5).

4.2 Recommendations

The trainers focus on paying attention to training programs that develop the speed of the motor response of handball goalkeepers because they have an effective role in their skill performance.

- Dealing with other handball goalkeeper skills and researching the extent to which the speed of the motor response contributes to their performance.
- Research on other physical abilities in the extent of their contribution to the handball goalkeeper skills and for different ages.

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