The relationship of motor response speed to the accuracy of the performance of the shooting skill in handball for students

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ABSTRACT

The nature of performance in the game of handball is characterized by fast rhythm and surprise as well as successive and sequential skills that require a high level of accuracy in performance, and this is what imposes on the players to adapt and prepare for those situations, including the possession of physical, skill and mental abilities commensurate with the variables witnessed by the matches, especially the decisive ones and close results and that the importance of the research is to study the reality of the relationship between the speed of motor response and the accuracy of correction in handball for students.

The objectives of the research were to identify the speed of motor response among the students of the third stage in the College of Physical Education and Sports Sciences / Al Ain University, and to identify the accuracy of the performance of the skill of shooting in handball among students of the third stage in the College of Physical Education and Sports Sciences / Al Ain University, and to identify the relationship between the speed of motor response and the accuracy of shooting in handball among students of the third stage / College of Physical Education and Sports Sciences / Al Ain University, either the research methodology The researcher used the descriptive approach In the manner of correlation relations to suit the research problem, the research community was determined and the researcher chose their research sample in a deliberate way from the third stage students in the College of Physical Education and Sports Sciences at Al Ain University for the academic year 2024/2025, which numbered (30) students, where the sample of the exploratory experiment was excluded, and one of the most important conclusions is that there is a significant relationship between the speed of motor response and the accuracy of shooting in handball for students.

1- Definition of research

1-1 Introduction to the research and its importance:

The rapid development in various areas of life, especially in the field of physical education, imposes the need to rely on scientific and objective foundations, and the use of modern methods in both theoretical and applied aspects, in order to achieve correct and lasting sports achievement. Handball is one of the most prestigious team games in the world, as it enjoys wide popularity and great public demand.

Due to the importance of this sport, there has been great interest by researchers and specialists, which contributed to the development of its technical level and the increase in the number of practitioners and its spread significantly. Handball requires a set of rapid tactical movements that require a smooth transition between offensive tactics and defensive tactics, given the close relationship between them. Among the key skills that play a crucial role in the performance of players is the skill of shooting, which requires high mastery due to its importance in achieving the team's scoring goals. Sports performance in handball requires a high level of accuracy and integrated physical preparation, in addition to the development of all the basic elements related to this skill. Also, the physical effort exerted during competitions requires advanced skill and physical preparation to enhance the efficiency of the functional systems in the body, whether internal or external. Recent scientific advances have strengthened the relationship between physical education and natural sciences, such as physiology, anatomy, and biomechanics, which is clearly reflected in handball, which is characterized by BThe multiplicity and complexity of their movements.

The speed of motor response is one of the basic motor abilities that play an important role in the implementation of offensive and defensive tactical skills in handball, as it contributes, along with other physical abilities, to resolving different situations during play. Handball performance is characterized by fast rhythm and surprise, as well as skill sequence and sequencing, which requires a high level of accuracy in performance. Players must possess physical, skill and mental abilities that are in line with the nature of the changes that occur during matches, especially in moments. Decisive in which there is convergence in results.

Here lies the importance of research in studying the relationship between the speed of motor response and the accuracy of shooting in handball among students, with the aim of improving the technical and tactical performance of this vital skill.

1-2 Research problem:

The speed of motor response represents a distinct place in the implementation of the performance of the skill of correction in handball because of the accompanying variables in the rhythm of play, which was characterized by speed if the change in play and the attempt to move from attack to defense and vice versa on the field shows the extent of the necessary need for this motor ability and focus on it in the game of handball as it is one of the most important abilities that allow the player to

progress in the level so the researcher saw to know the relationship between the speed of motor response and the accuracy of the performance of the skill of correction In handball.

1-3 Research Objectives:
The research aims to:
1- Identify the speed of motor response among students of the third stage in the College of Physical Education and Sports Sciences / Al Ain University
 2- Identify the accuracy of the performance of the skill of shooting in handball among students of the third stage in the College of Physical Education and Sports Sciences / Al Ain University
3- Identify the relationship between the speed of motor response and the accuracy of shooting in handball among students of the third stage / College of Physical Education and Sports Sciences / Al Ain University
1-4 hypothetical research:

- There is a statistically significant correlation between the speed of motor response and the accuracy of the performance of the shooting skill in handball among third stage students in the College of Physical Education and Sports Sciences - Al Ain University.

1-5 Research Areas:
Human field: Human field: students of the third stage, College of Physical Education and Sports Sciences / Al Ain University.
Range : 15 / 12 / 2024 to 4 / 3 / 2025
Spatial field: Handball court at the College of Physical Education / Al Ain University.

2- Research Methodology and Field Procedures:
2-1 Research Methodology:
It is the method followed by the researcher to determine the steps of the research through which a solution to his problem can be reached (2002 ،محجوب)
 Therefore, the researcher used the descriptive approach in the style of correlation appropriate to the research problem.
2-2 Research population and sample:
The research community was determined and the researcher chose his research sample in a deliberate way from the third stage students in the College of Physical Education and Sports Sciences at Al Ain University for the academic year 2024-2025 (Division D), which numbered (30) students, where the exploratory experiment sample was excluded.

2-3 Homogeneity:

The purpose is to reduce the differences to the lowest possible between the members of the sample The researcher homogenization process for the research sample in the variables of age, height and weight (the researcher used the law of torsion coefficient to conduct homogeneity between the members of the sample as shown in Table (1).

Table (1)

Shows the arithmetic mean, standard deviation, median and torsion coefficient in the study variables

Torsion coefficient (L)	Median (f)	Standard deviation (±p)	Arithmetic mean (Q)	Processors Variables
0.345-	178.5	8.989	177.466	**Length**
0.272	72.5	11.737	73.566	**Weight**
0.058-	290.5	8.653	290.032	**lifetime**

All the values of the torsion coefficient were between ($\pm$ 3), which indicates the homogeneity of the sample in the above variables

2-4 Aids and tools:

2.4.1 Aids:

1- Arabic sources.

2- A questionnaire form to determine the tests.

3- Personal interviews

4. Observation

5- Tests and measurement.

2.4.2 Utilities:

  (Handball court - goal (goal) - registration form - whistle - stopwatch - handballs - manual calculator type (Casio)

2-5 Identification of tests:

The purpose of determining the appropriate test to measure the speed of motor response and the accuracy of shooting handball "The researcher presented a questionnaire form to determine the appropriate tests and they distributed it to those with experience and competence in the field of handball, motor learning and sports training, where the tests that got a percentage of (75%) and above were taken and what is lower than that was neglected as it is on the researcher to obtain a percentage of (75%) or more of the opinions of the arbitrators and table (2) shows that.(اخرون، 1983)

Table (2)

Shows the percentages of expert selection for tests

Percentage	audition	Variables
80%	Kinetic Response Speed Test (Nelson)	**Motor response speed**
10%	Running against the signal	
10%	Motor Response Time Test	
10%	Aim the ball towards three circles drawn on the wall	**Correction**
10%	Aiming at a small target 7 meters away	
80%	Shooting from stability towards goal	

2.6 Exploratory Experiment:

The researcher conducted an exploratory experiment on 16/1/2024 on a sample of the original population numbering (10) other than the research sample, and its purpose is:

- o Diagnose errors that may accompany the application of tests.
- o Identify the validity and integrity of the utilities used in conducting tests.
- o Recognize the time it takes to perform tests.
- o Diagnosis of the most prominent obstacles that accompany the work.
- o Extract the scientific foundations of tests.

2-7 Scientific foundations of tests:

2.7.1 Honesty:

By truthfulness we mean "the ability of a test to measure what it was designed for or the attribute to be measured. The research tests were presented to a number of specialized experts, who confirmed the validity of the research tests for the purpose for which they were developed, and therefore the presentation of the forms to experts and specialists is considered the sincerity of the content. (باهي، 1999)

2.7.2 Stability:

Stability is "the ratio of real variance included in the variance of experimental scores. The research tests were applied to a number of students of the College of Physical Education and Sports Sciences / Al Ain University, who were excluded from the main research sample, which numbered (10) players, and after seven days, the research tests were repeated and a simple correlation coefficient was found between the two tests. (وآخرون، 2002)

2.7.3 Objectivity:

It means that the estimators do not differ in judging something on a particular topic, and although the research tests are tests that have specific and clear conditions and

do not show subjective bias, the correlation coefficient has been found between them and Table (3) shows that. (باهي، 1999)

Table 3

Shows the coefficient of stability and objectivity of the tests used

Objectivity coefficient	Coefficient of stability	auditions	t
0.86	0.85	Motor response speed	1
0.92	0.89	Correction	2

The value of the tabular correlation coefficient is equal to (0.707) with a degree of freedom (6) and a significance level (0.05)

2-8 Specifications of tests:

2.8.1 Test the speed of motor response:(خريط، 1989)

The tests used are described:

Nelson's motor response test:

- Purpose of the test: Measuring the speed of motor response:

- Tools used: area with a length of (20 m) and width (2 m) free of obstacles, tape measure, stopwatch

- Performance method: The tester stands at the end of the midline in the face of the timer, which stands at the end of the other end of the line and holds a stopwatch with one hand and raises it up and then quickly moves his arm either to the left or right and at the same time turns on the clock and at that time the tester runs at full speed to the line that the timer referred to and when he reaches the line away (6.40) he stops the clock.

- How to register: -

The time for each attempt is calculated.

The degree of the laboratory is: average attempts.
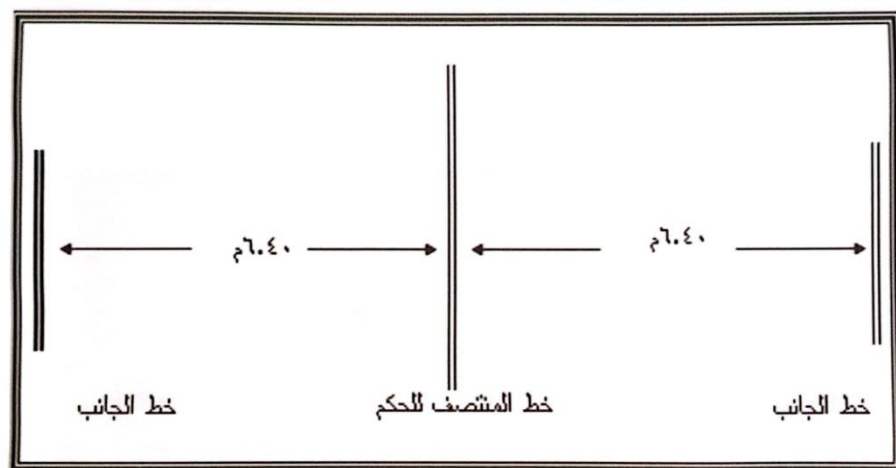
شكل (1)
يوضح اختبار سرعة الاستجابة الحركية

2.8.2 Accuracy test of aiming skill: (عوده، 2004)

Aiming Accuracy Test

The aim of the test is to measure the accuracy of aiming in handball

Performance method Drawing a handball goal on a front wall in the form of two posts and a crossbar (3×2) meters so that the shape representing the posts is in contact with the line of convergence of the wall and the pitch. Then divide the goal to measure the accuracy of shooting in handball into nine rectangles as in Figure (2) and draw a line on the ground (9) meters.

The player shoots from behind the line with the pivot step, taking into account that the one whose ball hits the rectangles (9,7,3,1), which represent the four corners of the goal, which have dimensions of (60×100) cm, obtains the final degree, which is four degrees. The one whose ball hits (2×8), which represents the area above the goalkeeper's head and between his feet, which has dimensions of (60× 100) cm, gets three degrees, and whose ball hits the rectangles (4,6), which represents the area of the range of the goalkeeper's arms, which dimensions (80 × 100) cm, gets two degrees, and whose ball hits the middle rectangle, which represents the chest and trunk of the goalkeeper, whose dimensions are (80×100) cm, deserves one degree, and if the ball comes outside that, the player gets zero. After completing the necessary heating, each player performs ten attempts.
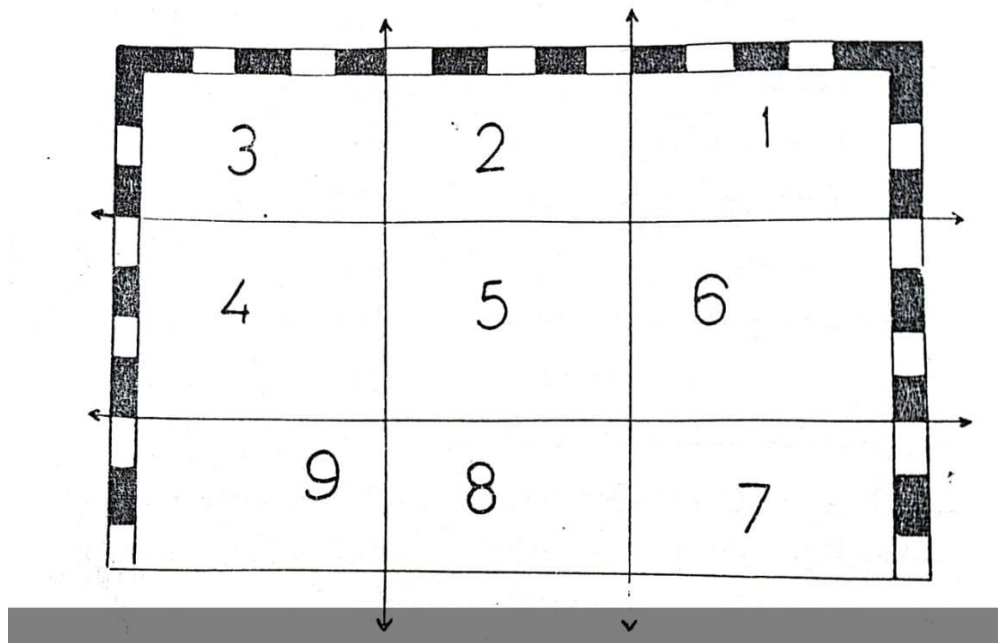

Figure (2)
Demonstrates the accuracy test of the aiming skill

2.9 Field research procedures

The research tests were applied on Wednesday and Thursday, 15-16/1/2025 AD, in the presence of the assistant work team and on the handball court at the College of Physical Education - Al Ain University, and the student's achievement in each test was measured.

2.10 Statistical Methods

The researcher used the following statistical methods: arithmetic mean - standard deviation. Torsion coefficient - median - percentage - correlation coefficient (Pearson).

4. Presentation, analysis and discussion of results
4.1 Presentation and analysis of results:

Table 4

Shows the arithmetic means, standard deviations, and simple correlation coefficient value to test the speed of the motor response and the accuracy of aiming with the handball.

Statistical significance	Calculated correlation coefficient value (t)*	Standard deviation _+A	Arithmetic mean Going to	Unit of measurement	Variables
Moral	0.72	0.17	0.93	second	**Motor response speed**
		3.37	13,40	degree	**Aiming accuracy**

*Under significance level (0.05) and degree of freedom (28)

Table (4) shows that the value of the arithmetic mean of the kinetic response speed test (0.93) and standard deviation (0.17), while the value of the arithmetic mean of the handball shooting accuracy test was (13.40) and a standard deviation (3.37), while the value of the simple correlation coefficient calculated was (0.72), which is greater than the value of the tabular correlation coefficient of (0.361) under the level of significance (0.05) and the degree of freedom (28) and this indicates that there is a significant correlation between the speed of the motor response and the accuracy of handball correction among students.

4.2 Discussion of the results:

It has appeared from the presentation and analysis of the previous results that there is a significant correlation between the speed of motor response and correction in handball, and the researcher attributes the reason for this to the fact that shooting towards the goal requires high technical skill to throw the ball and focus towards the goal, and this is consistent with what Eric Ban pointed out, "Looking at the goal before shooting, focusing and controlling the knowledge of the corrected hand plays a vital role in the accuracy of shooting, and the researcher attributes the reason for this to the importance of mental abilities, including speed Motor response and its necessity when shooting in handball, and this is confirmed by Zuhair Al-Khashab

that "in order for the performance to be successful, there are advantages that the player must be characterized by, such as choosing timing, good psychological ability and a sense of success, as well as calmness, the ability to focus and high self-confidence. The researcher attributes the reason for this to the importance of the speed of motor response when the player shooting, which requires the player's proficiency in the skill anywhere on the field, whether from movement, stability or jumping and from any position taken by the body, "and highlights the importance of the speed of motor response to the successful implementation of the skill of correction, which needs a certain amount of force, as well as the identification of temporal relationships in motor work and the consistency of different movements after complex perception processes, and this depends on the exact coordination In muscle contraction and relaxation . (Baty، 1979) (1999)حسين، ( )1999 ،.وآخرون ز(

The speed of motor response in the ability to accurately distinguish in the spatial and temporal characteristics of the movement as "determine the temporal relationships in the motor work and the coordination of movements after the complex perception processes and this depends on the exact coordination in the contraction and relaxation of the muscles, while the perception of the place is of great importance in the motor work. (1993 ،لويس و نزار طالب)

5. Conclusions and recommendations
5.1 Conclusions

Based on the findings of the research results, and the accompanying statistical treatments, discussion and extrapolation within the limits of the research sample and its nature, the researcher was able to reach the following conclusions:

1- There is a significant relationship between the speed of motor response and the accuracy of shooting in handball for students

5.2 Recommendations:

1- Conducting similar studies in the basic skills that were not addressed by the study.

2- Conducting similar studies for other age groups and knowing the results of these studies.

3- Paying attention to conducting tests and measurements periodically

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